There wasn't anything underneath but the clouds, and nothing overhead but the sky- Suddenly threads of white smoke appeared, silhouetted against the silvery metal of an approaching craft. They were not misty wisps of vapor; they were dense, sharply defined rocket trails.
The pilot watched grimly, helplessly. "That craft shot rockets at us. If they're guided we're stuck."
TOMORROW'S WORLD
through the minds of TODAY'S BEST WRITERS
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I

THERE WASN'T anything underneath but clouds, and there wasn't anything overhead but sky. Joe Kenmore looked out the plane window past the co-pilot's shoulder. He stared ahead to where the sky and cloudbank joined— many miles away—and tried to picture the job before him. Back in the cargo-space of the plane there were four big crates. They contained the pilot gyros for the most important object then being built on Earth; an object that wouldn't work without them. It was Joe's job to take the highly specialized, magnificently precise machinery to its destination, help to install it, and check it after it was installed.
He felt uneasy. Of course the pilot and co-pilot—the only other people in the transport plane—knew their stuff. Every imaginable precaution would be taken to make sure that a critically essential device like the pilot gyro assembly would get safely where it belonged. It was being treated as if it were eggs instead of massive metal, smoothed and polished and lapped to a precision practically unheard-of. But just the same Joe was worried. He'd seen the pilot gyro made. He'd helped on it. He knew how many times a thousandth of an inch had been split in machining its bearings, and the breath-weight balance of its moving parts.

He'd have liked to be back in the cargo compartment with it, but only the pilots' cabin was pressurized, and the ship was at eighteen thousand feet, flying west by south.
He tried to be reasonable about it. At eighteen thousand feet a good half of the air on Earth was underneath him. He hoped the rest would be as easy to rise above when the gyros were finally in place and starting out for emptiness. The gyros, of course, were now on their way to be installed in the first manned, permanent, really decisive artificial satellite of Earth. There were other man-made satellites now; there were reputedly more than two hundred hurtling objects circling the Earth out of atmosphere. Some of them were even useful, in that they reported levels of solar radiation and cloud-patterns on Earth as seen from space, and some of them relayed messages and even TV programs around the bulge of mankind's home planet. But the Space Platform would be something else. *It would be the initial, very first step of that figurative stepladder by which men would begin to climb toward the stars.*
Astronauts had circled the Earth hi nearby space. Somej had made multiple circuits of the Earth. But every one] had descended to Earth again, bringing his space capsule with him. The Space Platform wasn't coming back. Men would live in it, protected by massive covering shields, while they rose up beyond the Van Alien belts of deadly radiation. They'd take refuge hi shielded areas when solar flares made empty space deadly to all known forms of living creatures. But hi between they'd solve the problems nobody'd been even able to work on, for lack of a habitable satellite in space. And of course, from the very beginning it would be the answer to aggression and threats of atomic war.
The plane's co-pilot leaned back in his chair and] stretched luxuriously. He loosened his safetybelt and! stood up. He stepped carefully past that column between] the right hand and left hand pilot seats. That column con-! tained a fraction of the innumerable dials and controls the pilots of a modern multiengine plane have to watch andi handle. The co-pilot went to the coffeepot and nipped aj switch. Joe fidgeted. He wished he could be riding in back] with the crates. But his uneasiness seemed silly.
There was a steady roaring in the cabin. One got accustomed to the noise of the motors, and by now it sounded as if heard through cushions. Presently lie coffeepot bubbled. The co-pilot drew a paper cup of coffee and handed it to the pilot. The pilot drank. The co-pilot said, "Coffee?"
"No thanks," Joe replied.
"Everything okay with you?"
"I'm all right." Joe realized that the co-pilot felt talkative. He explained, "Those crates I'm travelling with—. The family firm's been working on that machinery for months. It was finished up with the final grinding practically done with feather dusters. I can't help worrying about it. There was four months' work in just lapping the shafts and balancing the rotos. We made a telescope mounting once, but compared to this job, we did that one blindfolded!"
"And watching all the time against sabotage, eh?"
"No," said Joe hi surprise. "Why should we?"
"Not everybody," said the co-pilot wryly, "is anxious to see the Platform take off. What do you think is the biggest problem where they're building it?"
The co-pilot sipped at bis own coffee and made a face. It was too hot.
"The main problem," he observed, "is keeping it from being blown up. There are plenty of sputniks and what-niks and such junk aloft. But once the Space Platform is floating around up there with a nice stock of atomic headed missiles on board, there are a lot of troublemakers who'll have to sing small. So they're doing what they can, to make the world safe for power politics. And they're doing plenty!"
"I've heard—," began Joe.
"You haven't heard the half of it," said the co-pilot. "The Air Transport's lost nearly as many planes on this job as in Asia, when that was the big transport job. There's a local hot war going on. No holds barred! Hadn't you heard?"
"Oh, I heard there was cloak-and-dagger stuff going on," said Joe politely.
The pilot put down his paper cup and handed it over. He said, "He thinks you're kidding him."
He turned back to the contemplation of the instruments before him and the view out the transparent plastic of the windows.
"He does?" The co-pilot said skeptically, "You don't have barbed wire around your plant, do you? No

identity badges. No Security officer screaming blue murder every five minutes. You don't have that kind of stuff at all! Or do you?"
"We don't," said Joe. "We know everybody who works at the plant. We've known them all their lives. The plant's been in the same village for eighty years. It started making wagons and plows, and now it turns out machine tools and precision machinery. It's the only factory around, and everybody who works there went to school with everybody else, and so did our fathers, and we know one another!"
The co-pilot was unconvinced.
"No kidding?"
"No kidding," Joe assured him.
"I guess there are such places," the co-pilot said enviously. "You should've built the Platform! It's plenty different on this job! We can't even talk to a girl without Security clearance, and we can't speak to strangers or be out after dark."
The pilot grunted. The co-pilot's tone changed.
"It's not quite that bad," he admitted, "but it isn't fun. Last week was a bad one. We lost three planes. One flew to pieces in midair: Sabotage; carrying critical stuff. One crashed on take-off: carrying irreplaceable instruments; somebody'd put a detonator in a servomotor. And one froze in its landing approach and flew smack into the field; they had to scrape it up. This ship got a major overhaul two weeks ago. We flew it with our fingers crossed the first three trips. Maybe it's all right. But I won't look forward to a serene old age until the Platform's up and out of atmosphere. Not me!"
He went to put the pilot's empty cup in the disposal slot.
The plane flew on. There wasn't anything underneath but clouds, and there wasn't anything overhead but sky.
The clouds were a long way down, and the sky was simply up. Joe looked down and saw the rainbow-ringed shadow of the flying plane. It raced madly over the irregular upper surfaces of the cloud layer. The plane flew and flew. Nothing happened at all. This was two hours from the field from which it had taken off with the pilot gyros as its last item of collected cargo. Joe remembered how sharply the two crew members had prevented anybody from even approaching the plane on the ground, with the sole exception of men actually loading on the crates. And those workers had been watched every second.
Joe fidgeted. He didn't know how to take the copilot's talk. The Kenmore Precision Tool plant was owned by his family, but it wasn't so much a family as a civic enterprise. The young men of the village grew up to regard fanatically fine workmanship with the casualness elsewhere reserved for plowing or deepsea fishing. Joe's father owned the plant now, and some day Joe might head it, but he couldn't hope to keep the respect of the men unless he could handle any tool in the place and split a thousandth at least five ways. Ten would be better. But while the feeling at the plant was the way it was now, there'd never be a security problem.
If the co-pilot was telling the truth, though ...
Joe found a slow anger beginning inside him. He'd had a picture in his mind which was practically a dream. It was of something big and bright and ungainly floating silently in emptiness with a field of stars behind it. It would be the space platform.
Other, lesser artificial satellites might flash enviously past below it. They were a strange and motley crew. Some were shaped like cones, some like balls, some like pyramids, and many of them sprouted whiplike antennae in all directions. Some waved paddles. Some looked like nightmares. But they were very, very, very much smaller than the platform and very far below it.
From the Platform the stars were tiny pinpoints of light. They were unwinking and distinct because there was no air, here, and the blackness between them was absolute because this was space itself. The platform was a moon. A manmade moon in which men could live and
work. It was a very vividly pictured dream, as Joe thought of it. It would be unbearably bright where the sun shone on it, and abysmally black in the shadows,— except that sometimes the earthshine would outline it in a ghostly fashion.
Most important, there would be men inside it, working, while it made a splendid orbit around the world that had built it. Sometimes there'd be small ships—-so Joe envisioned it—which would fight their way up

to it, panting great plumes of rocket vapor, to bring food and air and fuel to its crew. And eventually there would come a ship that wouldn't go down again to the vast and nearby world. It would fill its fueltanks with the fuel the other ships had brought—and it would have no weight at all. So it could be allowed to drift away from the Platform and suddenly its rockets would spout flame and fumes, and it would head triumphantly out and away from Earth. And it would be the first vessel ever to strike out for the stars.
That was the picture Joe had of the Space Platform and its meaning. Maybe it was romantic, but men were laboring now to make it real. This transport plane flew now toward a small town improbably called Bootstrap, carrying one of the most completely essential devices for the Platform's equipment. In the desert near Bootstrap there was a gigantic construction shed. Inside it, men were building exactly the monstrous object Joe imagined. They were trying to realize a dream men have had for decades— the necessary platform' which would be the dock, the launching pad, the starting point from which the first of human space explorers could start men's march toward infinity.
The idea that anybody could want to halt such an enterprise made Joe Kenmore burn.
The co-pilot painstakingly crushed out his cigarette. The ship flew with rather more of steadiness than a railroad car upon its rails. There was the constant, oddly cushioned sound of the motors. It was all very matter-of-fact.
"Look!" Joe said angrily, "Is any of what you've said —well—kidding?"
"I wish it were, fella," said the co-pilot. "I can talk to you about it, but most of it's hushed up. I tell you—"
"Why can you talk to me?" demanded Joe suspiciously. "What makes it all right for you to talk to me?"
"You've got passage on this ship. That means something!"
"Does it?"
The pilot turned in his seat to glance at Joe.
"Do you think we carry passengers regularly?" he asked mildly.
"Why not?"
Pilot and co-pilot looked at each other.
'Tell him," said the pilot.
"About five months ago," said the co-pilot, "an Army colonel wangled a ride to Bootstrap on a cargo plane. The plane took off. It flew all right until it was twenty miles from Bootstrap. Then it stopped checking. It drove straight for the Shed the Platform's built in. It was shot down. When it hit, there was an explosion."
The co-pilot shrugged. "You won't believe it, maybe. But a week later they found the colonel's body back East. Somebody'd murdered him."
Joe blinked.
"It wasn't the colonel who rode as a passenger," added the co-pilot unnecessarily. "It was somebody else. Twenty miles from Bootstrap he'd shot the pilot and taken the controls. They figure he meant to dive into the Shed. He had an atom bomb on board his plane. It's detonator didn't happen to work."
Joe saw the implication, here. Cranks and crackpots might hate the Platform. Many of them did. But they couldn't get hold of an atomic bomb. It would take a large nation to have it on hand. So it wasn't only cranks and crackpots who objected to the building of the Platform. There could be nations, not quite willing to go to war, but certainly ready to try anything less. And the result in a strictly limited field would be as near warfare as anybody dared.
The pilot said sharply, "Something down below!"
The co-pilot fairly leaped into the righthand seat. He
was in place and his safetybelt buckled in half a heartbeat.
"Check," he said in a new tone. "Where?" The pilot pointed.
"I saw something dark," he said briefly, "where there was a hole hi that cloud."
The co-pilot threw a switch. Within seconds a new sound entered the cabin. *"Beep ..... beep ..... beep ..... beep."* They were thin, batlike squeaks, spaced a
full half-second apart, rising in pitch during their brief hearability. The co-pilot snatched a handphone from the wall above his head and held it to his lips.
"Flight two-twenty calling," he said crisply. "Something's got a radar on us. We saw it. We're at eighteen

thousand and—" here the floor of the cabin tilted markedly—"now we're climbing. Get a fix on us and come a'running! Over!"
He took the phone from his lips and said conversationally, "Using radar is proof there's dirty work at the crossroads. Somebody's taking a chance!"
Joe clenched his hands. The pilot did things to the levers on the column between the two pilots' seats. He said curtly, "Arm the jatos."
The co-pilot clicked down a lever and murmured, "Check!"
All this took place in seconds. The pilot had said, "I see something," and instantly there was swift, tense teamwork hi action. A call by radio, asking for help. The plane climbing for greater clearance between it and the clouds. The jatos made ready for firing. They were the jet-assisted-take-off rockets which on a short field or a rough one would double the engine's thrust for a matter of seconds. In straightaway flight they should make the plane leap like a scared rabbit. But they wouldn't burn long.
"I don't like this," said the co-pilot hi a flat voice. '1 don't see what—"
Then he stopped. Something zoomed out of a cloud. The thing was incredible and commonplace at the same time. The thing that appeared was a silver winged private plane, two motored, of the sort that cruises at
three hundred miles an hour and can do five, if pushed. It was expensive, but not large. It came straight up out of the cloud layer and went lazily over on its back and dived down into the cloud layer again. It looked like somebody stunting, against all reason, in clouds,—where a sensible man does not stunt. It looked like the kind of crazy thing for which there is no justification.
But there was an explanation for this.
At the very top of the loop, threads of white smoke appeared. They should have been unnoticeable against the cloud. But for the fraction of an instant they were silhouetted against the plane's own silver wings. And they were not thin vapor. They were dense, sharply defined rocket trails.
They leaped upward. They unreeled a cord of writhing smoke. They gained velocity, instant by instant.
The pilot hit something with the heel of his hand. There was a heartstopping delay. Then the transport ship leaped forward with a force to stop one's breath. The jatos bellowed and the ship jumped. The sound of the motors was drowned out by the jatos' roar. Joe was slammed against the back of his seat. He struggled to resist the force which pushed him tailward. He heard the pilot saying calmly.
"... rockets. If they're sidewinders or anything that homes on its target, we're sunk!"
But this was an undercover operation. It was intended to be murder. It was definitely intended to sabotage the Space Platform. And saboteurs and murderers and undercover operators of all varieties have to work against a definite handicap. They can't use equipment such as authorized personnel find useful. If a saboteur uses a rocket, he can't test a sophisticated guidance system to be sure it will work right. There can be no countdown on preparations for a murder; it has to be done when chance allows it. So the means used to attack the transport plane had to be practically primitive; a two-motored private plane and rockets that could track their target by the heat of its exhaust. An actual fighter plane would have had Joe and the others absolutely at its mercy. But not a plane like this one.
The co-pilot said between his teeth; "Not sidewinders; no. But they'll have proximity fuses ..."
Then the plane bucked. At that moment it was very probably strained far past the limit of stress for which it was designed. Only one rocket detonated. The others went off instants afterward. The rockets had proximity fuses. Had they ringed the transport ship and gone off with it enclosed, it would now have been a tumbling bit of wreckage. But the jatos had thrown it ahead and out of the rockets' target area. Now they cut off and it seemed as if the ship had braked. But the pilot dived steeply for speed.
The co-pilot was saying coldly into the microphone, "It shot rockets. Looked like Army issue three point fives with proximities. They missed, but we're mighty lonely!"
The plane tore on, both pilots watching the cloud-bank below. They moved their bodies as they stared out the windows, so that by nq possibility would the plane's window mask something that they should see.
As they searched, the co-pilot went on evenly into the transmitter at his lips, "He wouldn't have more than four rockets, and he's dumping his racks and firing-equipment now. But he might have a friend with him. Better get here fast if you want to catch him! He'll be the most innocent private pilot you ever saw!"

[v] Then the pilot grunted. Something was streaking across the cloud formation far, far ahead. Three things. They were jet fighters, and they seemed not so much to approach as to swell in size. They were coming at better than five hundred knots—ten miles a minute—and the transport was heading for them at its own topmost speed. The jets and the transport .approached each other at a rate which would have been alarming if it were not so satisfactory.

The co-pilot said crisply into the hand-phone from above his head, "Silver Messner with red wingtips. The number began—"

He gave the letter and first digits of the vanished private plane's designation, without which it could not take off from or be serviced at any flying-field. Joe heard an insistent *"beep-beep-beep-beep"* which would be a

radar on one of the jet fighters. He could not hear what the co-pilot might hear in answer to his crisp reports.

One of the jets peeled off and sank into the cloud layer. The others came on. They set up great circles about the transport, crossing before it, above it, around it, with much the effect of flying around an object which was not moving at all.

The pilot flew on, frowning. The co-pilot said, "Sure! I'm listening!" There was a pause. Then he said, "Check. Thanks."

He hung the handphone back where it belonged. He thoughtfully mopped his forehead. He looked at Joe. "Maybe," he observed," you'll believe me now when I say there's a small war on, to keep the Platform from lifting off."

"Here's the third jet coming up again." It was true. The jet that had dived into the clouds now came up out of the fleecy stuff with an air of impassive satisfaction, "Did they find the guy?"

"Yeah," said the co-pilot. "He must've picked up my report. He didn't dump his radar. He stayed in the cloud-bank. When the jet came for him he tried to ram it. So the jet blew him apart. Maybe they'll find out something from the wreckage."

Joe wet his lips.

"He was trying to smash us!" he protested. "He tried to smash us with rockets! Where'd he get them?"

The co-pilot shrugged.

"Maybe smuggled in. Maybe stolen. They could've been hauled anywhere in a station wagon. The plane was a private type ship. Plenty of them flying around. It could've been bought easy enough. All they'd need would be a farm somewhere where it could put down and strap on a rocket rack. The big problem is information. How'd they know what was on this ship?"

A shadow passed over the transport. A jet shot past from above it. It waggled its wings and changed course.

"We're to land and be inspected for damage," grunted the pilot. "The jets will show us the way—as if we needed it!"

Joe pushed himself back into his seat. He still had in

his mind the glamorous and alluring picture of the Space Platform finished and floating grandly in its orbit, with whitehot sunshine on it and a multitude of stars beyond, envied and admired by all the strangely shaped lesser satellites sweeping about their lowlevel paths in space.

He'd been concerned with the actual making of essential items in the Platform's equipment, but he'd thought about the Platform mostly in terms of the drama and the glamour of what it should achieve. Now he had a new view of it. When anything important is to be done, nine-tenths of the job of accomplishing it is fighting off the obstacles put in its way by people whose business it isn't. He began to feel a great respect for those people he'd never thought about before; the people who were simply and doggedly getting the job done despite those who wanted things to stay as they were.

Presently the transport sank down toward the clouds. It swept through them blindly in the mist. And then there was solid ground, and a remarkably small airfield, and the pilot and co-pilot began a sort of ritual conversation Joe .dimly saw might be as important as anything else.

"Pitot and wingheaters," said the pilot.

The co-pilot put his hand successively on two controls.

"Off."
"Spark advance," said the pilot.
The co-pilot moved his hands.
"Blowers?" • . .
"Low," said the co-pilot.
"Fuel selectors?" ;
The co-pilot moved his hands again to the appropriate; controls, verifying that they were as he reported them. >
"Main on," he said matter-of-factly. "Crossfeed off."
The transport slanted down steeply for the landing field which had looked so small at first, but expanded remarkably as they drew near.
Joe found himself scowling. He began to see how complex a job it was merely to get the Space Platform ready to try to start off on a journey that in theory should last forever. It was daunting to think that before a habitable artificial moon could be built and lifted to space, such wildly irrelevant things would be needed as ways to find
undesirable private planes in cloudbanks, and even a checklist for a transport plane to be used before every takeoff and landing—just to make sure that necessary, precious, precision parts could be flown to the job. The details involved in getting the Platform built began to loom up as a monstrous, perhaps impossible burden.
But the job was worth doing. Joe was glad he was to have a share in it.

2

THE TRANSPORT plane stood by the door of a hangar on the military airfield, and mechanics stood well back from it and looked it over. One man crawled over the tail assembly and found one small, ragged hole in the aluminum sheeting of the stabilizer. When the war rockets exploded, some fragment had gone through. The pilot verified that the tiny missile had hit no inner strengthening member inside. He nodded. The mechanic made two very neat patches over the two holes, upper and lower. He continued his examination of the fusilege. The pilot turned away.
"I'll go talk to Bootstrap," he told the co-pilot. "You keep an eye on things."
"I'll keep two eyes on them," said the co-pilot.
The pilot moved oft,.toward the control tower of the field. Joe looked around. The transport ship seemed very large, suddenly, standing as it did on a concrete apron with its tricycle landing gear let down. It somehow made one think of an enormous and misshapen insect, standing elaborately high on inadequate, spindling legs. Its cargo body, in particular, didn't look right for an aircraft. The top of the cargo section went smoothly back to the stabilizing surfaces, but the bottom did not taper. It
ended aft in a clumsy looking bulge which was closed by a huge pair of clamshell doors. It was designed that way so very large objects could be run into the rear opening. But it didn't look streamlined, and it definitely wasn't pretty.
"Did anything get into the cargohold?" asked Joe in sudden anxiety. "Did the cases I'm responsible for get hit?"
After all, four rockets had exploded deplorably near the transport. If one fragment had struck, others could have.
"Nothing big, anyhow," the co-pilot told him. "We'll know presently."
But examination showed no other sign of the ship's recent nearness to destruction. It had been overstressed, certainly, but ships usually are. A spotcheck on certain areas where excessive flexing of the wings would have shown up—a big ship's wings are not perfectly rigid; they'd come to pieces in the air if they were—presented no evidence of damage. The ship was ready to take off again. , The co-pilot watched jealously until the one mechanic went back to the sidelines. The mechanic was not cordial. He and the others regarded the ship and Joe and the co-pilot with disfavor because they worked on jets, and to suggest that they needed to be watched did not set well with them.
"They think I'm a suspicious heel," the co-pilot said sourly, "but I have to be! The best spies and saboteurs

in the world have been assigned to mess up the Platform. When better saboteurs are made, they'll be put on the same job!"
The pilot came back from the control-tower.
"Special flight orders," he told his companion. "We top off with fuel and get going."
Mechanics got out the fuelhose, dragging it from the pit. One man climbed up on a wing. Other men handed up the hose. Joe was moved to comment, but the co-pilot was reading the new flight instructions. It was one of those moments of inconsistency to which everybody is liable. The two men of the ship's crew had it in mind to be infinitely suspicious of anybody near their ship. But fueling it was so completely standard an operation that they read their orders while it went on.
One wingtank was full. A big, grinning man with sandy hair dragged the hose under the nose of the plane to take it to the other wingtank. Close by the nosewheel he slipped and steadied himself by the shaft which runs down to the wheel's hub. His position for a moment was absurdly ungraceful. When he stood up, his arm slid up into the wheelwell. But he dragged the hose the rest of the way and passed it to the man on the wing. Then that tank became full. The refueling crew got down to the ground and fed the hose back into its pit. That was all. But somehow Joe remembered the sandy haired man and his arm going up inside the wheelwell for part of a second.
The pilot tucked away his orders. The co-pilot tucked away his. He nodded to Joe, and the three of them swung up and into the nose compartment by the pilot's doorway.
They settled into their places. There was that small, specific ritual of making absolutely sure that everything requisite for a proper takeoff was ready. Then the pilot threw a switch and pressed a knob. One motor turned over stiffly, and caught. The second. Third. Fourth. The pilot listened, glanced at the instruments, and was satisfied. Word from the control tower. The pilot pulled back on the multiple throttle. The plane trundled away. Minutes later it faced the length of the runway, a voice from the control tower spoke out of a speaker in the wall, and the plane roared down the field. In seconds it lifted and swept around in a great circle.
"Wheels up," said the pilot.
The co-pilot obeyed. The rest of the after-take-off ritual followed. Lights showed the wheels retracted, this and that normal, these and those other items reporting all clear. The pilot relaxed.
"You know," said the co-pilot, "these saboteurs have some pretty smart tricks. We've been briefed on 'em. One kind of hit me, though it's from away back in World War Two. Down in Brazil there was a field where planes took off to fly to Africa. But they'd take off, head out to sea, get a few miles offshore, and then blow up. A dozen planes
were lost that way! Then it broke. There was a sergeant in the maintenance crew who was sticking handgrenades up in the nosewheel wells. German, he was, and very tidy about it, and nobody suspected him. Everything looked okay and tested okay. But when the ship was well up and away, and the co-pilot retracted the wheels, it lightened a string that pulled the pin of a grenade. It went off. The field's master mechanic caught the saboteur finally and nearly killed him before the MPs could stop him. There's plenty of that stuff. They pour it into us to make us cagey. And we are, whether the groundcrews like it or not!"
Joe said drily, "You were, except when they were topping off. You took that for granted." He told about the sandy haired man. "He hadn't time to stick anything in there, though," he added.
The co-pilot blinked. Then he looked annoyed.
"Confound it, I didn't watch! Did you?"
When the pilot shook his head, the co-pilot said bitterly, "And I thought I was security conscious! Thanks Jor telling me. No harm done this time, but that was a slip!"
He scowled at the dials before him. The plane flew on.
They passed the halfway mark of their journey. The two-thirds mark. They entered upon the last leg. It should be no more than an hour and a half before they reached their destination. Joe felt a certain anticipative elation. The Space Platform was a dream that had been his since he was a very small boy. It was also the dream of grown men. There were Sputniks and TV satellites and weather satellites, and there'd been astronauts and orbital flights. But in essence those were stunts. The Space Platform wouldn't *be?*. It would be the beginning of the actual conquest of space. It would make real spacetravel possible. It

wouldn't make trips to the moon or planets itself, of course, rather, it would sail splendidly around the Earth, in an orbit out past the Van Alien bands, and it would carry atomic-headed guided missiles, and every city in the world would be defenseless against it—therefore every city in the world would be defended by it.

This last fact was why desperate efforts were in order to destroy it before it was completed.

The co-pilot spoke suddenly.

"How do you rate this trip? I asked before, but you dodged answering. Usually, even generals have to go to Bootstrap aground. How do you rate it? Have you got connections hi Bootstrap?"

Joe pulled his thoughts back from what the Platform would mean hi years to come. He hadn't thought it remarkable that he was allowed to accompany the gyros from his father's plant to their destination. The family firm had built them, so it had seemed natural, to him. He wasn't used to the idea that everybody was suspicious to a security officer connected with the Platform.

"Connections? I haven't any." Then he remembered. "Oh, yes. I do know somebody. Not hi Bootstrap, though. There's a Major Holt out there. He might have cleared me. He's known my family for years."

"Yeah!" said the co-pilot, with irony. "He might have cleared you! Matter of fact, he's the senior security officer on the whole job. He's hi charge of everything from the security guards to the radar screens and the jetplane umbrella and the checking of the men who work hi the Shed. If he says you're clear, you're cleared!"

Joe hadn't meant to seem impressive, "I don't know him too well," he explained. "He knows my father, and his daughter Sally's been kicking around underfoot most of my life. I taught her how to shoot and she's a better shot than I am. She was a nice kid when she was little. I got to like her when she fell out of a tree and broke her arm and didn't even whimper." He grinned. "She was trying to act grown-up last time I saw her."

The co-pilot nodded. There was a brisk chirping sound somewhere. The plane changed course. Sunlight shifted as it poured into the cabin. The plane was running on automatic pilot, now, and was again well above the cloudlevel at an even numbered number of thousands of feet altitude, as was suitable for planes travelling south or west. Now it droned along its new course, forty five degrees from the original. Joe found himself guessing that this was one of the security provisions for planes approaching the Platform. It might be ordered that they not come too near on a direct line, lest they give information to curious persons on the ground.

Time went on. Joe went gradually back to his meditations about the Platform. There was always in his mind the picture of a manmade thing shining in blistering sunlight between Earth and moon. But he began to remember things he hadn't paid too much attention to before.

There'd been opposition to the bare idea of a Space Platform from the instant it was first seriously proposed. Nationalist political parties; peddlers of hate and entrepreneurs of discord; cranks and crackpots and members of the lunatic fringe to the left and right—all denounced it. Some called it impious. More raved that it was a scheme to make the United States in a position to rule all the Earth. As a matter of fact, the United States had first attempted to have it a United Nations enterprise. But it did not get past the General Assembly. It was so rabidly attacked that it did not even reach the Council— where it would have been vetoed anyhow!

But it was exactly that furious denunciation which put it through the United States Congress, which had to find the money for it.

In Joe's eyes and those of most who hoped for it, the great appeal of the Platform was that it was the necessary first step toward interplanetary travel, with starships yet to come. But most scientists wanted it desperately for the progress of their own sciences. There were low temperature experiments, electronic experiments, weather observations, star temperature measurements, astronomical observations ... Any man in any field of science could name reasons for it to be built. Even the atomic scientists had one, and nearly the best. Their argument was that there were new developments of nuclear theory which needed to be tried out, but should not be tried out on Earth. There were some reactions which ought to yield unlimited power for all the world from really abundant materials. But there was one chance in fifty that they might not be safe, because the materials were so abundant. No sane man would risk a one-in-fifty chance of destroying

the Earth and humanity with it, but in a space-ship a few million miles out in emptiness those reactions could be tried. Either they'd be safe, or not. But the only way to get a laboratory so safely far from Earth was to make a Space Platform as a starting point.

But despite these excellent reasons, it was the Platform's enemies who really got it built. The American Congress would never have appropriated funds for a Platform for pure scientific research, no matter what benefits it promised. But the vehemence of those who hated it sold it to Congress as a means of national defense.

These were ironic aspects that Joe hadn't thought about before, just as he hadn't thought of the danger to the building Platform from those who would try to destroy it. Protecting it was now Sally's father's job, and it wouldn't be an easy one.

He found himself wondering how Sally liked living out where the most important task on Earth was in progress. She was a nice kid. He remembered appreciatively that she'd grown up to be a very goodlooking girl. He tended to remember her mostly as the tomboy who could beat him swimming, but the last time he'd seen her, come to think of it, he'd been startled to see how pretty she'd grown!

He came to himself again. There was a change in the look of the sky ahead. There was no actual horizon, of course, there was a white haze which blended imperceptibly into the cloud layer, so it was impossible to say where the sky ended and the clouds began. But presently there were holes in the clouds. The ship droned on and later it floated over the edge of such a hole, and looking down was much like peering over the edge of a cliff at solid ground far below.

The holes increased hi number. Presently they joined together, and there were no holes but clouds breaking up a good view of the landscape. Presently even the clouds were left behind and the air was clear—but still there was no horizon—and there was brownish earth with small green patches, but on beyond there was sere brown range. From eighteen thousand feet there were simply no details. Changes in tint, yes. There were blurs which were certainly not herds of cattle but ought to be, and here and there those pockmarks of greenishness which might be mesquite or something similar. The ground was not actually desert, but the vegetation was strictly dry land stuff.

Eventually there was only haze far ahead and to the right and left. And then there came a new sound above the droning hum of the motors. Joe heard it—and then he saw.

Something flashed down from nowhere. It streaked on ahead and banked steeply. It was again a jet fighter, and for an instant Joe saw the distant range seem to ripple and dance in its exhaust blast. It circled watchfully.

The transport pilot manipulated something. There was a change hi the sound of the motors. Joe followed the copilot's eyes. The jet was coming up from astern, dive brakes extended to reduce its speed. It overhauled the transport. And then the transport's pilot touched one of the separate prop controls very gently, and again, and again. Joe, looking at the jet, saw it through the whirling blades. There was an extraordinary stroboscopic effect. One of the two starboard propellers, seen through the other, abruptly took on a look which was not that of mistiness, but of writhing, gyrating solidity. The peculiar appearance vanished, and came again, and vanished and appeared again before it disappeared completely.

The jet shot on ahead. Its divebrakes retracted. It made a graceful, shallow dive, and then climbing almost vertically skyward, it went out of sight.

"Visual check," said the co-pilot drily, to Joe. "We had a signal to give. Individual to this plane. We didn't tell it to you. You couldn't duplicate it."

Joe worked it out painfully. The visual effect of one propeller seen through another. This was identification. It was not a type of signalling an unauthorized or uninformed passenger would expect.

"Also," said the co-pilot," we have a television camera in the instrument board yonder. It's turned on now. The interior of the cabin is being watched from the ground. No more tricks like the phony colonel."

Joe sat quite still. He noted that the plane was slanting gradually downward. His eyes went to the dial that showed descent at somewhere between two and three hundred feet a minute. That was for his benefit. The cabin was pressurized, though it didn't attempt to simulate sealevel air pressure. It was a good deal better than the outside air, though, and yet too quick a descent meant discomfort. Two to three hundred feet per minute was about right.

The ground took on features. Small gulleys. Patches of coloration too small to be seen from farther up. The feeling of speed increased. After many long minutes the plane was only a few thousand feet high. The pilot took over manual control from the automatic pilot. He seemed to wait. There was a plaintive, mechanical "Beep-beep" and he changed course.

"You'll see the Shed hi a minute or two," said the copilot. He added vexedly as if the thing had been bothering him; "I wish I hadn't missed that sandy haired guy putting his hand hi the nosewheel well! Nothing happened, but I shouldn't have missed it!"

Joe watched. Very, very far away there were mountains, but he suddenly realized the remarkable flatness of the ground over which they flew. From the edge of the world, behind, to the very edge of the far distant hills, the ground was flat. There were gullies and depressions here and there, but no hills. It was flat, flat, flat!

There was a tiny glimmer of reflected sunlight as the plane flew on. Joe strained his eyes. The sunlight glinted from the tiniest possible round pip on the brown earth. It grew as the plane flew on. It was half a cherrystone. It was half an orange, with gores. It was the top hah* of a sphere that was simply too huge to have been made by men.

There was a thin thread of white that ran across the dun colored range and reached that halfball and ended there. It was a highway. Joe realized that the halfglobe was the Shed, the monstrous building made for the construction of the space platform. It was gigantic. It was colossal. It was the most stupendous thing that men had ever created.

There was a tiny projection near the base of it. It was an office building for clerks and timekeepers and the like.

He strained his eyes again and saw a motortruck on the white highway. It looked extraordinary long. He saw that it wasn't a track but a convoy of them. A long way back, the highway was marked with a tiny dot. That was a motorbus.

There was no sign of activity anywhere, because the scale was too great. Movement there was, but the things that moved were too small to be seen by comparison with the Shed. The huge, round, shining half-sphere of metal stood tranquilly in the midst of emptiness.

It was bigger than the Pyramids.

The plane went on, descending. Joe craned his neck, and then he was ashamed to gawk. He looked ahead, and far away there were other white speckles which would be buildings. Bootstrap, the town especially built for the men who built the Space Platform. In it they slept and ate and engaged hi the uproarious festivity that men on a construction job tend to crave on their time off.

The plane dipped noticeably, now.

"Airfield off to the right," said the co-pilot. "That's for
•the town and the job. The jets—there's an air umbrella
overhead all the time—have a field somewhere else. The
pushpots have a field of their own, too, where they're
training pilots."

Joe didn't know what a pushpot was, but he didn't ask. He gazed at the Shed, which was the greatest building ever set up, and had been built merely to house the greatest hope for humanity while that hope was put together. He'd be hi the Shed, presently. He'd work there, setting up the contents of the crates back hi the plane's cargo space and finally installing them in the Platform itself.

The pilot said, "Pitot and whig-heaters?"

"Off," said the co-pilot.

"Spark advance?"

Joe didn't listen. It was the before-landing ritual. He looked down at the sprawling small town with white painted barracks and a business section and obvious, carefully planned recreation areas which nobody would use. The plane was making a great half circle. The motor noise tended to dim, as Joe became absorbed hi the pros-
pect of seeing the Space Platform shortly and having a hand hi its building.

The co-pilot said sharply, "Hold everything!"

Joe jerked his head around. The co-pilot had his hand on the landing gear release. His lips were tense.
"It doesn't feel right," he said very, very quietly. "Maybe I'm crazy, but I'm remembering that there was a sandy haired man who put his hand in the nosewheel well back at that last field. And this doesn't feel right!"
The plane swept on. The airfield passed below it. The co-pilot very cautiously let go of the wheel release, which when pulled should let the wheels fall down from their enclosures to lock themselves in landing position. He moved from his seat. Joe saw his face again. His lips were pinched and tight. He scrabbled at a metal plate hi the flooring. He lifted it and looked down. A moment later he had a flashlight hi use. Joe saw the edge of a mirror. There were two mirrors. One could look through both of them into the wheelwell.
The co-pilot made quite sure. He stood up, leaving the plate off the opening hi the floor.
"There's something down hi the wheelwell," he said in a brittle tone. "It looks to me like a grenade. There's a string tied to it. At a guess, that sandy haired guy set it up like that saboteur sergeant from Brazil. Only, it rolled a little; and this one goes off when the wheels go down. I think, too, if we bellyland. Better go around again, eh?"
The pilot nodded.
"First," he said coldly, "we get word down to the ground about the sandy haired character, so they'll get him, regardless."
The co-pilot picked up the telephone hanging above and behind his seat. He began to speak into it. The transport plane made wide, sweeping circles over the desert beyond the airport while the co-pilot explained that there was a grenade hi the nosewheel well, set to explode if the wheels were let down. Probably, also, if the ship came in to a belly landing.
Joe found himself astonishingly unafraid. But he was filled with a throbbing rage. He hated the people who
wanted to smash the pilot gyros because they were essential to the Space Platform. He hated them more horribly than he'd known he could hate anybody. He was so filled with fury that it did not occur to him that in any crash or explosive landing that would ruin the gyros, he would automatically be killed.

3

THE PILOT made an examination down the floorplate hole, using a flashlight to see by and two mirrors to show him the contents he couldn't possibly reach with any instrument. Joe heard his report, made to the ground by radio.
"It's a grenade," he said coldly. "It took time to fix it the way it is. At a guess, the ship was boobytrapped at the tune of its last overhaul. Anyhow, it was arranged that the boobytrap's trigger had to be set at a different place and time. We've been flying two weeks with that grenade in the wheelwell. It was out of sight. Today, back at the airfield where we landed for a check against damage, a sandy haired man reached up and pulled a string he knew how to reach. It probably loosed a slipknot. The grenade rolled down to a new position, and now when the wheel goes down the pin will be pulled. You can figure things out from that."
It was an excellent sabotage device. If a ship blew up from a placed bomb two weeks after overhaul, it would not be guessed that the bomb had been fitted into place and arranged for activation so long before. A man who merely reached in and pulled a string so the bomb was made ready for firing would never be suspected. There might be dozens of planes in action right now, carrying their own destruction with them.
The pilot spoke into his microphone.
"Probably . .." He listened. "Very well, sir."
He turned away and nodded to the co-pilot, now sav-
.',cly staring at the hole left when the floorplate came up.
[1] he ship flew in wide, sweeping circles, the rims of which
;irely touched the farthermost corner of the airport down
dow.
"We've authority to jump," he said briefly. "You know 'here the chutes are. But there is a chance I can

belly-ind without the grenade blowing. I'm going to try that."
The co-pilot shook his head.
"I'll get him a chute." He indicated Joe, and added furi-usly, "But if you ride her down, so do I! Ask if we .hould dump cargo before we land."
The pilot lifted his microphone again. He spoke. He listened.
"Okay to dump stuff to lighten ship."
"You won't dump my crates!" snapped Joe. "And I'm staying to see you don't! If you can ride this ship down, so can I!"
The co-pilot got up and scowled at him.
"Anything I can move out, goes. Will you help?"
Joe followed him through the door into the cargo-compartment.
The space there was considerable, it was also bitterly cold. The crates from the Kenmore plant were the heaviest items of cargo, but there were others. The copilot made his way to the rear and pulled a lever. Great, curved doors opened at the tail-end of the cargo-space. There was instantly such a bellowing of motors as made all speech impossible. The co-pilot pulled out a sheaf of colored paper slips and checked one with the nearest moveable parcel. He painstakingly made a checkmark and began to push the box toward the doors.
It was not a conspicuously sane operation. So near the ground, the plane tended to wobble. The air was distinctly bumpy. To push a massive box out a doorway so it would tumble down a thousand feet to desert sands, was not very safe. But Joe helped. They got the box to the door and shoved it out. It went spilling down. The co-pilot hung on to the doorframe and watched it land. He chose another box. He checked it off. And another. With Joe's help
he got them out the door and dropping dizzily. The plane soared on in circles. The desert as seen through the clamshell doors reeled away astern and then seemed to tilt, and reeled away again. Joe and the co-pilot labored furiously. But the co-pilot checked each item before he jettisoned it. Presently he came to a bale and waved Joe aside. He shouted a reason, but Joe cold not hear it. They pushed and dragged other cargo items.
It was a deliberate way to dump cargo to destruction. A metal bound box. Over the edge of the cargo space floor. A piece of machinery, visible through the slats of its crate. A box marked, *"Instruments. Fragile."* Each one checked off on a colored paper slip. A small dynamo. This item. That. A crate marked *"Stationery."* It would be printed forms for timekeepers and such.
It should have been. It wasn't.
It dropped out. The plane bellowed on. And suddenly there was a burst of bluewhite flame halfway down to the desert. It had exploded. Perhaps a time-detonator had arrived at the instant for self destruction at just this moment. Perhaps the loss of weight in falling had set off a detonator.
The co-pilot spoke explosively and furiously in the blasting uproar of the engines. He vengefully marked the waybill of the parcel that had blown up. But then they went back on the job. They worked well as a team, now. In no more than minutes everything was out but the four crates that were the gyros. The co-pilot regarded them dourly, and Joe clenched his fists. The clamshell doors closed, and it became possible to hear onesself think, again.
"Ship's lighter," reported the co-pilot, back in the cabin. "Tell 'em this is what exploded."
The pilot reported the waybill number and description of the case that had been an extra bomb. There had been much thought and effort expended to make quite sure the gyros would not arrive at the Space Platform. It was even possible to guess that more than one kind of sabotage had been intended for the transport ship. It looked as if different enemies of the Platform had worked independently of each other, though with similar information about the transport's cargo.
"I'm dumping gas now," said the pilot into the microphone, "and then coming in for a bellylanding."
The ship flew straightaway. It flew more lightly. It bounced a little. But when gas is dumped one has to slow ID not more than a hundred seventy-five knots and fly level, and then one is supposed to fly five minutes after dumping with the dumping chute in the drain position— ;md even then there is forty-five minutes of flying fuel still in the tanks.
The ship swept around and headed back for the now far distant field. It went slowly lower and lower until it seemed barely to skim the minor irregularities in the ground. And, low down like this, the sensation of speed

was great.
The co-pilot went back into the cargo space. He brought back an armful of chutes. He dumped them on the floor. "If that grenade does go!" he said sourly. Joe helped. In the few minutes before Bootstrap loomed near, they filled the bottom of the cabin with packed parachutes. Especially around the pilots' chairs. And there was a mound of them above the actual place where the grenade should be. Soft stuff like packed chutes will absorb an explosion better than harder material. But there was a chance it wouldn't blow. "Hold fast," said the pilot curtly.
The wing-flaps were down. That slowed the lightened ship a little. They went in over the edge of the field less than a manheight high. Joe found his hands closing convulsively on a handgrip. He saw a crashwagon starting out from the side of the runway. A firetruck started for the line the plane followed.
Four feet above the rushing ground surface. Three. The pilot eased back the stick. His face was craggy and grim and very hard. The ship's tail went down and dragged. It bumped. Then the plane careened and slid and half whirled crazily; the world seemed to come to an end. Crashes. Bangs. Shrieks of torn metal. Bumps. Thumps and grindings. Then a roar.
Joe pulled himself free from where he'd been flung —it seemed to him that he peeled himself loose—found the pilot struggling up, and grabbed at him to help. The
co-pilot hauled at both of them, and abruptly all three were in the open and running full speed away from the ship.
The roar became a bellowing. There was an explosion. Another. Flames sprouted everywhere. The three of them ran stumblingly. But even as they ran the co-pilot swore.
"We skipped something!" he panted. "That fire—"
Joe heard a crescendo of booming, crackling noises behind. Something exploded with a racking detonation. But he should be far enough away, now.
He turned to look, and he saw blackening wreckage enveloped in a roaring fire. The flames were monstrous. They rose, it seemed, sky-high; more flames than forty-five minutes of gasoline should have produced. As he looked, something blew up shatteringly, and flames raged even more furiously. In such heat the delicately adjusted gyros would be warped and ruined, even if the crash hadn't wrecked them beforehand. Joe made thick, incoherent sounds of rage.
The plane was now an incomplete and twisted skeleton, licked through by flames. The crashwagon squealed to a stop beside them.
"Anybody hurt? Anybody left behind?"
Joe shook his head, unable to speak for fury. The fog wagon roared up, already spouting mist from its nozzles. Its tanks contained water treated with detergent so that it broke into the finest of droplets when sprayed at four hundred pounds pressure. It drenched the burning wreck with fog in which a man would drown. No fire could possibly burn in such a water aerosol. In seconds, it seemed, there was only steam and white vapor and fumes of smouldering substances that gradually diminshed.
There was a roaring of motorcycles as they raced across the field with a black car trailing them. The car pulled up beside the crashwagon, and stopped, and came swiftly to where Joe was emerging from wild anger to sink into sick, black despair. What had happened wasn't his fault, but he had been responsible for the pilot gyros and their safe arrival. And it was not his job merely to remain blameless. It was his job to get the gyros delivered and set up in the Space Platform.
He hadn't done it.
The black car braked and stopped. There was Major Holt. Joe had seen him six months before. He'd aged a good deal. He looked grimly at the two pilots.
"You dumped your gasoline. What's burning now?"
Joe said thickly, "Everything was dumped but the pilot gyros. They didn't burn! They were crated at the plant!"
The co-pilot suddenly made an incoherent sound of rage.
"I've got it!" he said hoarsely. "I know—"
"What?" snapped Major Holt.
"They planted the grenade at the major overhaul," panted the co-pilot, too enraged even to swear. "But besides that—besides that—. I pulled the fire-extinguisher releases just as we hit! For all compartments! To flood everything with CO2! But it wasn't CO2! That's what burned!"
Major Holt turned his head. Somebody materialized beside him. He said harshly;
"Get the fire extinguisher bottles sealed and take them to the laboratory."

"Yes, sir!"
A man went running toward the wreck. Major Holt said coldly, "That's a new one. We should have thought of it. You men get yourselves attended to and report to Security at the Shed."
The pilot and co-pilot turned away. Joe had started to go with them, when he heard Sally's voice.
"Joe! Come with us, please!"
Joe hadn't seen her, but she was in the car. She was pale. Her eyes were wide and frightened.
"I'll be all right." Joe said stiffly. "I want to look at those crates."
Major Holt spoke curtly, "They're under guard. They'll have to be photographed and such before anything's touched. And I want a report from you anyhow. Come along!"
Joe looked. The motorcycles were abandoned and there were already armed guards around the still-smoking wreck, watching the men of the fogwagon as they hunted
for remaining sparks or flame. It was noticerble that nobody else moved toward the scene of disaster. There were figures moving back toward the edge of the field. They'd started out to be near the excitement. But the guards were on the job. Nobody could approach. The onlookers went back to their proper places.
"Please, Joe!" said Sally shakily.
Joe got drearily into the car. The instant he seated himself, the vehicle was in motion again. It went swiftly across the field and out the entrance, its horn blaring as it went streaking toward the town and abruptly turned to the left. In seconds it was on a broad white highway that left the town behind and led toward more empty desert.
But not quite empty. Far, far away there was a great halfglobe rising against the horizon. The car hummed toward it, its tires singing. And Joe looked at it and felt ashamed, because this was where the Space Platform waited for pilot gyros—among other things—and he hadn't brought them.
Sally moistened her lips. She brought out a small box and opened it. There were bandages and small bottles. "I've a first-aid kid, Joe," she said unsteadily. "You're burned! Let me do something for the worst ones, anyhow!"
Joe looked at himself. One coat sleeve was burned to charcoal. His hair was singed on one side. A trouser leg was burned off around the ankle. When he noticed, his burns hurt.
Major Holt watched her spread a salve on scorched skin. He showed no emotion whatever.
"Tell me what happened," he commanded. "All of it."
There seemed little use in it, but Joe told it baldly as the car went on. The great halfball of metal loomed larger and larger but did not seem to grow nearer as Sally practised first aid. They came to a convoy of trucks, and the horn blared, and they turned out and passed it. Once they passed another convoy of empty vehicles on the way back to Bootstrap. They went on.
Joe finished drearily. "The pilots did everything anybody could, sir. They even checked off the parcels as they were dumped. We reported one that blew up."
"Those were orders," Major Holt said detachedly. "We've gained some information, anyhow. The pilots are probably right about the plane having been boobytrapped during its last overhaul and the traps armed later. I'll have that checked immediately, and we'll see if we can find out how it was done. The man you think armed the trap on this plane—An order for his arrest is on the way now. I told my secretary. And—Hmmmm. That CO2—"
"I didn't understand that," said Joe, depressedly.
"Planes have fire alarm warning systems and CO2 bottles to put fires out," said the Major. "A fire in flight lights a red light on the instrument panel, telling where it is. The pilofpulls a handle and CO2 floods the compartment, putting it out. Since the plane was coming hi for a crash landing, the pilot obeyed standard orders and flooded all compartments with CO2. Only it was something else."
"Oh, no!" Sally said hi horror.
"The CO2 bottles were filled with an inflammable or an explosive gas," said her father, unbending. "Instead of making a fire impossible, they made it certain. We'll have to watch out for that trick now!"
Joe was too much disheartened for any feelings, save bitter gloom and a much more bitter hatred of those who were ready to commit any crime—and had committed most—in the attempt to destroy the Platform. The Shed that housed it rose against the skyline. It became huge. It became monstrous. It became

unbelievable. But Joe could have wept when the car pulled up at an angular, three story building jutting out from its base. From the air, this substantial building had looked like a mere chip. The car stopped. They got out. A sentry saluted as Major Holt led the way inside. Joe and Sally followed. The Major jerked his thumb at Joe and spoke briefly to a uniformed man.

"Get him some clothes. Get him a longdistance telephone connection to the Kenmore Precision Tool Company. Let him talk. Then bring him to me again."

He disappeared. Sally tried to smile at Joe. She was still quite pale.

"That's Dad, Joe. He means well, but he's not cordial. I was in his office when the report of sabotage to your

plane came through. We started for Bootstrap. We were on the way when we saw the first explosion. I—thought it was your ship." She winced a little at the memory. "I knew you were on board. It was—not nice, Joe!"

She'd been badly scared. Joe was minded to thump her encouragingly on the back, but he suddenly realized that it would no longer be appropriate. So he said gruffly, "I'm all right."

He followed the uniformed man. He began to get out of his scorched and tattered garments. The sergeant brought him more clothes. He put them on. He was just changing his personal possessions to the new pockets when the sergeant came back again.

"Kenmore plant on the line, sir."

Joe went to the phone. On the way he discovered that the banging around he'd been through had produced a number of places that hurt.

He talked to his father.

Afterward, he realized that it was a queer conversation. He felt guilty because something had happened to a job that had taken eight months to do and that he was escorting to its destination. He told his father about that. But his father didn't seem concerned. Not nearly as much as he should have been. He asked urgent questions about Joe himself. Was he hurt? How much? Where? Joe was astonished that his father seemed to think such matters more important than the pilot gyros. But he answered the questions and explained the exact situation and a certain desperate hope he was trying to cherish. His father give him advice.

Sally was waiting again when he came out. She took him into her father's office and introduced him to her father's secretary—an extraordinarily plain woman with a sorrowful expression—and Joe explained carefully that he was to hunt up Chief Bender, who was working on the Platform. He was one of the few firstclass men who'd left the Kenmore plant to work elsewhere. Joe and the Chief, between them, should estimate the damage and the possibility of repair.

Major Holt listened. He was military and official and harassed and curt and tired. Joe had known Sally and

therefore her father all his life, but Major Holt wasn't an easy man to be relaxed with. He spoke into thin air and his sadseeming secretary wrote out a pass for Joe. Then he gave crisp orders on a telephone and asked questions.

Sally said, "I know! I'll take him there. I know my way around."

Her father's expression did not change. He simply included Sally hi his orders on the phone. Then he said briefly, "The plane will be surveyed and taken apart as soon as possible. Then you can examine the crates. I'll have you cleared for it.'"

His secretary reached in a drawer for orderforms to fill out and hand to him to sign. Sally tugged at Joe's arm. They left.

Outside, she said, "There's no use arguing with him, Joe. He has a terrible job and it's on his mind all the tune. He's got poor Miss Ross—his secretary, you know —so she just listens to what he says must be done and she writes it out. He goes days, sometimes, without speaking to her directly. But things are pretty bad! It's like a war with no enemy to fight, but only spies. And the things they do! They've been known even to boobytrap a truck after an accident they've caused, so anybody who tries to help

will be killed. Everything has to be done hi a certain way or it will be ruined!"
She led him to an office with a door opening directly into the Shed. In spite of his bitterness, he was morosely impatient to see inside there. But Sally had to identify him formally as the Joe Kenmore who was the subject of her father's orders, and his fingerprints had to be taken, and somebody had him stand for a moment before an X-ray screen. Then she led the way through the door, and he was hi the Shed where the Space Platform was under construction.
It was a vast cavern of metal sheathing and spidery girders, filled with sounds and detail. It took him seconds to begin to absorb what he saw and heard. The Shed was forty storeys high in the middle, and it was all clear space without *a. single* column or interruption. There were arclamps burning about its edges, and high up somewhere there were strips of glass which let in an insufficient light.
All of it resounded with many noises and clanging echoes of them.
There were rivetguns at work, and there were the grumblings of motortrucks moving about, and the oddly harsh noise of welding torches. But the torchflames looked only like marshfires, blue-white and eerie, against the mass of the thing that was being built.
It was not too clear to the eye, this incomplete Space Platform. There seemed to be a sort of mist; a glamor about it, which was partly a veiling mass of scaffolding. But Joe stared at it with an emotion which blotted out his feeling of shame.
It was gigantic. It had the dimensions of an ocean liner. It was strangely shaped. Partly obscured by the fragile seeming framework about it, there was bright plating in swelling curves, and the plating reached up irregularly and followed a peculiar pattern, and above the plating there were framemembers—themselves shining brightly hi the light of many arclamps—and they rose up and up toward the roof of the Shed itself.
The Platform was ungainly and it was huge, and it rested under a hollow metal half-globe that could have doubled for a sky. It was not more than thirty storeys high, itself, but there were men working on its uppermost parts, and they seemed like specks. The far side of the Shed's floor had other men there, and they resembled merely jerkily moving motes. Joe couldn't see their legs move as they walked. The shed and the Platform were monstrous!
Joe felt Sally's eyes upon him. She looked proud, somehow. He took a deep breath, speechless.
She said, "Come on."
They walked across acres of floor, all paved with glistening wooden blocks. They moved toward the thing which was to take mankind's first real, actual step toward the stars. As they moved centerward, a big sixteen wheel truck-and-trailer outfit backed out of an opening under the maze of scaffolding, and turned clumsily. It carefully circled the scaffolding and moved toward a sidewall of the Shed. A section of the wall lifted inward like a flap, and the sixteen wheeler and its trailer trundled out into
the sunlight. Four other trucks scurried after it. Other trucks came in. The sidewall section closed.
There was the smell of engine fumes and hot metal, and of ozone from electric sparks. There was that indescribable sound a man can get homesick f6r, to be found only where constructions of massive metal worked on by men produce an atmosphere that does not exist anywhere else. Joe walked almost like someone in a dream, with Sally satisfiedly silent beside bun, until the scaffolds, which looked like veiling, became latticework and he saw openings.
They walked into one such tunnel. The bulk of the Platform loomed above them with a sort of crushing menace. There were trucks rumbling all around underneath, in the maze of scaffold columns. Some carried ready loaded cages waiting to be snatched up by hoists. Crane grips came down, and snapped fast on the cages, and lifted them up and out of sight. There was a Diesel running somewhere, and a man stood and stared up and and made motions with his hands, and the Diesel adjusted its running to his signals. Then some empty cages came down and landed in a waiting truck body with loud clanking noises, and somebody cast off the hooks and the truck grumbled and went away.
Sally spoke to a preoccupied man in shut sleeves with a badge on an armband near his shoulder. He looked carefully at the passes she carried, using a flashlight to make sure of them. Then he led them to a shaft up which a hoist ran. It was very noisy, here. A rivetgun banged away somewhere nearby, and the plates of the Platform seemed to ring with the sound, and the echoes screeched, and the bedlam sounded

infinitely good to Joe's ears. The man with the armband shouted into a telephone and a hoistcage came down and Joe and Sally stepped on it. Joe took a firm grip on Sally's shoulder, and the hoist shot upward. The hugeness of the Shed and the Platform grew even more apparent as the hoist accelerated toward the roof. The flooring seemed to expand. Spidery scaffoldbeams dropped past them. There were things being built over by the sidewall. Joe saw a crawling inplant towtruck
moving past these enigmatic objects. It was a tiny truck, no more than four feet high and with twelve-inch wheels. It dragged behind it flat plates of metal with turnedup edges. They slid over the floor like toboggans. Cryptic loads were carried on those plates, and the towtruck stopped by a mass of steel piping being put together, and began to push stuff off the plates....

Then the hoist slowed abruptly and Sally winced a little. The hoist stopped.

Here, twenty storeys high, a welding crew worked on the skin of the Platform itself. The plating curved in and there was a wide flat space parallel to the ground. There was, a great gaping opening beyond, where plating was not yet placed and framemembers rose roofward for a long way still. The opening, Joe guessed, would eventually be the door of an airlock. This flat surface was for a tender rocket to anchor to by magnets, when it came up from Earth with supplies or reliefs for the Platform's crew, or with fuel to be stored for an exploring-ship's eventual use. Yes. A rocket would anchor here and then inch toward that doorway.

There were half a dozen men in the welding crew. They should have been working. But two men battered savagely at each other, their tools thrown down. One was tall and lean, with a wrinkled face and an expression of intolerable fury. The other was dark and squat, with a look of desperation. A third man was in the act of putting down his welding torch—he'd carefully turned it off first—to try to interfere. Another man gaped. Still another was climbing up a ladder from the scaffold-level below.

Joe put Sally's hand on the hoist-upright, instinctively freeing himself for action.

The lanky man lashed out a terrific roundhouse blow. It landed. The stocky man bored in. Joe had an instant's clear sight of his face. It was not the face of a man enraged. It had the look of a man both desperate and despairing.

Then the lanky man's foot slipped. He lost balance and the stocky man's fist landed. The thin man reeled backward.

Sally cried out, shaking. The lanky man teetered on the edge of the flat place. Behind him, the plating curved down. Below him there were twenty storeys of fall down through the steel-pipe maze of scaffolds. If he took one step backward he was gone inexorably down a slope on which he could not stop.

He took that step. The stocky man's expression turned to pure horror. The lanky man stiffened convulsively. He couldn't stop. He knew it. He'd go back and over the rounded edge, and fall. He might touch the scaffolding. It would not stop him. It would merely set his body to spinning crazily as it dropped and crashed and dropped, again and again, before it landed twenty storeys below.

It was horror in slow motion, watching the lean man stagger backward to his death.

Then Joe leaped.

4

FOR AN instant, in midair, Joe incongruously aware of all the noises of the Shed. The murky, girdered ceiling twenty storeys still above him. The swelling, curving, glittering steel underneath. Then he struck. He landed beside the lean man with his left arm outstretched to share his impetus. Alone, he would have had momentum enough to carry him up the slope down which the lean man had begun to descend. But he shared it. The two of them toppled forward together. Their arms were upon the flat surface while their bodies almost—almost!—slid. The feel of gravity pulling at them when they had nothing to grip was purest nightmare.

But then, as Joe's inwards crawled, the same stocky man who'd knocked the lean man back was dragging frantically at both of them to draw them to safety.

Then there were two men pulling. The stocky man's face was gray. His horror was proof that he hadn't intended murder. The man who'd put down his welding torch pulled. The man who'd been climbing the ladder put his weight to the task of getting them back to stable footing. They reached safety. Joe

scrambled to his feet. He felt a little bit sick at his stomach. The dark, stocky man began to shake horribly. The lanky one advanced upon him.
"I didn't mean to keel you, Haney!" the dark one panted.
"Okay! You didn't!" The lanky one snapped. "But come on now! We finish this."
He advanced toward the man who had so nearly caused his death. But the other man dropped his arms to his sides.
"I don' fight no more," he said thickly. "Not here. You keel me is okay. I don' fight no more. Not here!"
The lanky man—Haney—growled at him. "Tonight, then, in Bootstrap. Now get back to work!" The stocky man picked up his tools. He was trembling. Haney turned to Joe and said ungraciously, "Much obliged. What's up?"
Joe still felt queasy. There is rarely any high elation after one has risked his life for somebody else. He'd nearly plunged twenty storeys to the floor of the Shed. He swallowed.
"I'm looking for Chief Bender. You're Haney? Foreman?"
"Gang boss," said Haney. He looked at Joe and then at Sally, holding convulsively to the upright Joe had put her hand on. "Yeah," said Haney. "The Chief took off today. Some kind of Injun stuff. Funeral, maybe. Want me to tell him something? I'll see him when I go off shift."
There was an obscure movement somewhere on this part of the Platform. A tiny figure came out of a crevice that would some day be an air-lock. Joe didn't move his eyes toward it.
"Tell him Joe Kenmore's in town and needs him," he
said awkwardly. "He'll remember me, I think. I'll hunt him up tonight."
"Okay," said Haney.
Joe's eyes went to the tiny figure that had come out from behind the plating. It was a midget in baggy, work stained garments like the rest of the men up here. He wore a miniature welding shield pushed back on his head. Joe could guess his function, of course. There'd be corners a normal sized man couldn't get into, to buck a rivet or weld a plate. There'd be places only a tiny man could properly inspect. The midget regarded Joe without expression.
Joe turned to the hoist to go down to the floor below. Haney waved his hand. The midget lifted his, in grave salutation. The hoist dropped down the shaft.
"You saved that man's life, Joe," Sally said unsteadily. "But it scared me to death!"
Joe tried to ignore it, but he still seemed to feel slanting metal under him and a drop of twenty storeys straight down. It had been a nightmarish sensation.
"I didn't think," he said uncomfortably. "It was a crazy thing to do. Lucky it worked out."
Sally glanced at him. The hoist still dropped swiftly. Levels of scaffolding shot upward past them. II Joe had slipped down that rolling curve of metal, he'd have dropped past all these. It was not good to think about. He swallowed again. Then the hoist checked in its descent. It stopped. Joe somewhat absurdly helped Sally off to solid ground.
"Considering what happened at the airport," said Sally, "and while I was watching just now, it looks to me as if you're bound to make me see somebody killed. Would you—would you mind leading a little less adventurous life for a while, Joe? Anyhow while I'm around?"
He managed to grin. But still he didn't feel right.
"There's nothing I can do until I look at the gyros," he said, changing the subject, "And I can't find the Chief until tonight. Could we sightsee a little?"
She nodded. They went out from under the intricate framework that upheld the Platform. Sally indicated the sidewalls.
"Let's look at the pushpots. They're fascinating!" She led the way. Again the vastness of the Shed became evident. There was a catwalk partway up the inwardly curving wall. Someone leaned on its railing and surveyed the interior of the Shed. It would probably be a Security man. Maybe the fistfight on the Platform had been seen, or maybe not. The man on the catwalk was hardly more than a speck. It seemed to Joe that there must be watchers' posts high up on the outer shell, too, where men would search the sunlight desert outside for signs of things untoward.
But he turned and looked yearningly at the monstrous thing under the scaffolding. He could make out its

shape, now. It was something like an egg, but more like something else he couldn't put a name to. Actually it was exactly like nothing else in the world but itself, and when it was out in space there would be nothing left on Earth like it.
It would be, in a fashion, a world in itself and independent of the Earth which made it. There would be - hydroponic tanks hi which plants would grow to purify its *ah* and feed its crew. There would be telescopes, and men hi it would be able to study the stars as could never be done from the bottom of Earth's turbulent atmosphere. And it would serve Earth.
There would be communicators. There were communication satellites aloft now, but the Platform would outperform them many tunes over. It would pick up microwave messages and retransmit them to receivers far around the curve of the planet, or else store them and retransmit them to the other side of the world. It would store fuel with which men could presently set out for the stars—and out to emptiness for nuclear experiments which must not be made on Earth. Presently it would be armed with deadly atomic missies which no nation could possibly defy. And so it would keep peace on Earth. But it could not make goodwill among men. Sally walked on. They reached the mysterious objects being manufactured in a row around half the sidewall of the Shed. By comparison they were of simple design and not unduly large. The first were merely frameworks of
metal pipe, which men were welding unbreakably together. They were no bigger than, say, a housetrailer. A little way on they were filled with intricate arrays of tanks and tubing, and still farther—there was a truck and hoist unloading a massive object into place—there were huge engines fitting precisely into openings designed to hold them. And there were yet others being plated in, with metallic skins more or less complete. At the very end of the line a crane was loading a finished one onto a flatbed trailer. As it swung in the air Joe recognized what it was. It might be called a jet plane, but it was not of any type ever used before. It looked more like a beetle than anything else. It would not be really useful for anything but its function at the end of Operation Stepladder.
Then hundreds of the unwieldy objects would cluster upon the Platform's sides, like swarming bees. They would thrust savagely upward with their separate jet engines. They would lift the Platform from the foundation on which it had been built. Tugging, straining, panting, they would get it out of the Shed. But their work would not end there. Holding it aloft, they'd carry it as far and as high and as fast as their struggling engines could push it. Then there'd be one last surge of fierce thrusting by oversized Jato rockets built into each pushpot separately, but all of which would fire at once.
Then the clumsy things would drop off and come bumbling back home, while the Platform's own rockets flared out their mile-long flames as it headed up for emptiness.
But the building of these devices-—these pushpots—and all the other activities of the Shed would have no meaning if enemies of the Platform's purpose succeeded hi keeping objects like the pilot gyros from being delivered in working order.
Joe said restlessly, "Maybe doing anything else is useless, but I've got to find out just what happened to the gyros I was bringing, Sally!"
Sally said nothing. She turned, and they moved across the long, wide space of woodblock flooring toward the doorway by which they had entered. And now that he had seen the Space Platform, all of Joe's feeling of guilt and
despondency came back. It seemed unbearable. They went out through the guarded door, and Sally surrendered the pass while Joe was again checked carefully before he was allowed to go.
"You don't want me tagging around, do you?" Sally asked suddenly.
Joe hesitated. "You're nice enough, Sally, but if the stuff is really smashed, I'd—rather not have anybody see me. Please don't mind."
"I know," Sally said quietly. "I'll get somebody to drive you over."
She vanished, then she came back with the uniformed man who'd driven Major Holt. She put her hand momentarily on Joe's arm.
"If it's really bad, Joe, tell me. You won't let yourself cry, but I'll cry for you." She searched his face. "Really, Joe!"
He grinned feebly and went out to the car.

His feelings on the way to the airfield were not good ones. It was twenty miles from the Shed, but Joe dreaded what he was going to see, and the ride seemed all too short. The black car bumped up the road. It turned to the right off the white highway, out the curved shortcut —and there was the field.

And there was the wreck of the transport plane, still where it had crashed and burned. There were still armed guards about it, but there was a truck with a hoist nearby, and men were working on the wreck with torches. Already much of it was being tagged.

Joe went to the remains of the four crates.

The largest was bent askew, either by the force of the crash or the explosion. The smallest was a twisted mass of charcoal. Joe gulped and dug into them with borrowed tools. The pilot gyros of the Space Platform would apply the torque that would make the main gyros shift it to any desired position, or else hold it absolutely still. They were to act, in a sense, as a sort of steering engine on the takeoff and perform other useful functions out in space. If a star photograph was to be made, it was essential that the Platform hold absolutely still while the exposure lasted. If a guided missile was to be launched,

it must be started right, and the pilot gyros were needed. To turn to receive an arriving rocket from Earth ...

The pilot gyros were the steering apparatus of the Space Platform. They had to be more than adequate. They had to be perfect. On the takeoff alone, they were starkly necessary. The Platform couldn't hope to reach its orbit without them.

Joe chipped away charred planks, He pulled off flame eaten timbers. He peeled off carbonized wrappings, but some did not need to be peeled; they crumbled at a touch, and' in twenty minutes he knew the whole story.

The rotormotors were ruined. The couplers—pilot-to-main-gyro connections—had been heated redhot and were no longer hardened steel; their dimensions had changed so they would no longer fit. But these were not the really disastrous items!

The tragedy was the gyros themselves. On their absolute precision and utterly perfect balance the whole working of the Platform would depend. And the rotos were gashed in one place, and the shafts were bent. Being bent and nicked, the precision of the apparatus was destroyed. Its precision lost, the whole device was useless.

And it had taken four months work simply to get it balanced!

It had been the most accurate piece of machine work ever done on Earth. It was balanced to a microgram, to a millionth of the combined weight of three aspirin tablets. It would revolve at 40,000 revolutions per minute. It had to balance perfectly or it would vibrate intolerably. If it vibrated at all it would wrack itself to pieces, or failing that send ageing sound waves through all the Platform's substance. If it quivered by the least fraction of the ten thousandth of an inch, it would wear, and vibrate more strongly, and destroy itself and possibly the Platform. It needed the precision of an astronomical telescope's lens, multiplied. Since it was bent, it was exactly as useless as if it had never been made at all.

Joe felt as a man might feel if the greatest telescope on Earth, in his care, had been cracked. As if the most priceless picture in the world, in his charge, had been burned. He felt worse.

A truck rolled up and was stopped by a guard. There was some conversation, and the guard let it through. It was to pick up the useless pieces of equipment on which the best workmen and the best brains of the Kenmore Precision Tool Company had worked unceasingly for eight calendar months, and which now was junk.

Joe watched, numb6d by disaster, while the hoist lowered a hook down to position above the once precious objects. Men shored up the heavy things and ran planks under them, and then deftly fitted ropeslings for them to be lifted by. Shadows were slanting and long—it was now late afternoon—as the hoisttruck's gears whined, and the slack took up, and the first of the four charred objects lifted and swung, spinning slowly, to the truck that had come to take them away.

Joe froze. He stared. It settled into its place in the truck. He watched the second lift and rotate sedately as the ropes unwound. The third did not spin. It merely swayed. But the fourth—The lines up to the hoist-beam were twisted, as the largest crate lifted, it untwisted the lines by which it hung. It spun. It spun more and more rapidly, and then slowly, and it stopped, then it began to spin back.

Joe caught his breath. It seemed that he hadn't breathed in minutes. The big crate wasn't balanced. It was spinning. It wasn't vibrating. It spun around its own center of gravity, unerringly revealed by its flexible suspension.
He watched it nested *in* the truck. Then he went stiffly over to the driver of the car that had brought bun here.
"Everything's all right," he said, feeling a queer astonishment at his own words. "I'm going to ride back to the Shed with the stuff I brought. It's not hurt too much. I'll be able to fix it, with a man or two I can pick out up here. But I don't want anything else to happen to it!"
So he rode back out to the Shed on the tailboard of the truck that carried the crates. The sun set as he rode. He was smudged and disheveled. The reek of charred
wood and burned insulation and scorched wrappings was strong in his nostrils. But he felt like singing.
It occurred to him that he ought to have sent Sally a message that she didn't need to cry as a substitute for him. He felt swell! He knew how to do the job that would let the Space Platform take off! He could hardly wait to tell her.
It was very good to be alive.

5

THERE WAS nobody in the world to whom the Space Platform was meaningless. To Joe and a great many people like him, it was a dream long and stubbornly held to, now doggedly being made into a reality. To some it was the prospect of peace and the hope of a quiet life, with children and grandchildren and a serene looking forward into the future. Some people prayed yearningly for its success, though they could have no other share in its making. And of course there were men who had not gotten into power without brains or stayed there without ruthlessness. They knew that once world peace was assured their time of power and way of life was ended. So they sent grubby, desperate men to wreck the prospect at any cost. They were prepared to pay for or commit any crime if the Space Platform could be smashed and turmoil continued as the norm of life on Earth.
And there were the people who were actually doing the building.
Joe rode a bus into Bootstrap that night with some of them. The middle shift, two to ten o'clock was off. Fleets of busses rolled out from the small town twenty miles away, their headlights making a procession of paired flames hi the darkness. They rolled into the unloading
area and disgorged the late shift, ten to six, to be processed by Security and admitted to the Shed. Then, quite empty, the busses went trundling around to where Joe waited with the released shift milling around him.
The busses stopped and opened their doors. The waiting men stormed in, shoving zestfully, calling to each other, scrambling for seats or merely letting themselves be pushed on board.
The bus Joe found himself on was jammed hi seconds. He held on to a strap and didn't notice; he was absorbed in rapt contemplation of his idea for the repair of the pilot gyros. The motors could be replaced easily enough. The foundation of his first despair had been that everything could be handled but the most important—the all-important absolute accuracy of the gyros' balance. That, it had seemed, couldn't be reachieved. Securing it at the plant had consumed four months of time. Each of the gyros was four feet in diameter and weighed five hundred pounds. Each spun at 40,000 revolutions per minute. They'd had to be machined from a special steep to assure that they wouldn't fly apart from sheer centrifugal force. Each was plated with irridium lest a speck of rust form and throw it off balance. If the shaft and bearings were not centered exactly at the center of gravity of the rotors, five hundred pounds of steel at 40,000 r.p.m. could raise the devil! They could literally wreck the Platform itself. And "exactly at the center of gravity" meant exactly. There could be no error by which the shaft was offcenter by the thousandth of an inch, or a ten-thousandth. The accuracy had to be absolute!
Gloating over the solution he'd found, Joe could have hugged himself as he stood in the waiting bus. Outside, he saw another bus start off with a grinding of gears and a spouting of exhaust fumes. It trundled to the highway and rolled away. Another and another followed it. Joe's bus fell in line. They headed for Bootstrap in a convoy— a long, long strip of lighted vehicles running one behind the other.

It was dark outside. The Shed was alone, f&r security. It was twenty miles and more from the town where its workforce slept and ate and made merry. That was security,
too. One shift came off, and went through a security check, and during that time the Shed was empty except for the security officers who roamed it endlessly, looking for trouble. Sometimes they found it. The shift coming on also passed through a security check. Nobody could get into the Shed without being identified past question. The picture badge stage was long since passed in the Space Platform security system. Security was tight!
The long procession of busses rolled through the night. Outside was dark desert, overhead were many stars. Once, as the line of vehicles swayed and rumbled on, a tiny spark shot across the sky, with all the velocity of a meteor. But it was one of the larger artificial satellites, a balloon of aluminum foil, inflated by the vapor of an aromatic hydrocarbon and intended to test the possibilities of radio-reflection techniques. It had been expected to stay aloft perhaps a year. Nobody any longer set a term to its probable existence.
The men in the busses didn't know about its passage. They'd have been uninterested if they had. The air in the busses smelled of sweat and oil and tobacco. Somebody still had garlic on his breath from lunch.
There was noise. An argument proceeded, two seats up the aisle. There was the rumble of the motor and the peculiar sound of tires and voices all around. Men had to speak loudly to be heard above the din. There was bedlam.
There was a swaying among the crowded figures, more pronounced than that caused by the motion of the bus. Somebody was pushing his way from the back toward the front. The aisle was narrow. Joe clung to his strap, thinking hard and happily about the rebalancing of the gyros. There could be no tolerance. It had to be exact. There had to be no vibration at all...
Figures swayed away from him. A hand clasped onto his shoulder.
"Hiya."
He swung around. It was the lean man, Haney, whom he'd last seen atop the Platform. The man Joe'd kept from dropping from the level place twenty storeys up. "Hello." Joe murmured.
"I thought you were big brass," Haney rambled. "But big brass don't ride the busses." ' "I'm going in to try to hunt up the Chief," said Joe.
Haney grunted. He looked estimatingly at Joe. His glance fell to Joe's hands. Joe had been digging farther into the crates, and afterward he'd washed up, but packing grease is hard to get off. When mixed with soot and charcoal it leaves signs. Haney relaxed.
"We usually eat together," he observed, satisfied that Joe was regular, because his hands weren't soft and because mechanic's soap had done an incomplete job on them. "The Chief's a good guy. Join us?"
"Sure!" said Joe. "And thanks."
A brittle voice sounded somewhere around Haney's knees. Joe looked down, startled. The midget he'd seen up on the Platform nodded up at him. He'd squirmed through the press in Haney's wake. He seemed to bristle a little out of pure habit. Joe made room for him.
"I'm okay," said the midget pugnaciously.
Haney made a formal introduction.
"Mike Scandia." He thumbed at Joe. "He's eating with us. Wants to find the Chief."
There had been no reference to the risk Joe had run in keeping Haney from a twenty storey fall. Now Haney said warmly, "I wanted to say thanks anyhow for keeping your mouth shut. New here?"
Joe nodded. The noise in the bus made any sort of talk difficult. Haney appeared used to it.
"Saw you with Major Holt's daughter," he observed again. "That's why I thought you were brass. Figured one or the other'd tell on Braun. You didn't, or somebody'd've raised cain. But I'll handle it."
Braun would be the man Haney had been fighting. If he wanted to handle it his way, it was naturally none of Joe's business. He said nothing.
"Braun's a good enough guy," said Haney. "Crazy, that's all. He picked that fight. Picked it! Up there! Coulda been him knocked off, an' I'd've been in a mess! I'll see him tonight."
The midget said something biting in his peculiarly cracked and brittle voice.
The bus rolled and rolled and rolled. It was a long way to Bootstrap. The desert outside was utterly black

and featureless. Once a convoy of tracks came from ahead and disappeared behind, going to the Shed. Joe heard but didn't see them. They passed on the other side.
Presently, though, lights twinkled in the night. Presently again the bus slowed, in line with the others. Then there were barracklike buildings, succeeding each other. Then there was a corner and all the light outside changed. The busses drew up to a curb and stopped, and everybody was in a great hurry to get out, shoving unnecessarily, and Joe let himself be carried along by the crowd.
He found himself on the sidewalk with bright neon signs up and down the street. He was in the midst of the crowd which was the middle shift, released. It eddied and dispersed without lessening the number of people about. Most of the figures in sight were men. There were very few women. The neon signs proclaimed that here one could buy beer, and that this was Fred's Place, and this was Sid's Steak Joint. There was bowling. There was pool. A store, remaining open for this shift's trade, sold fancy shirts and strictly practical workclothes and highly eccentric items of personal adornment. A movie house. Somewhere a record shop fed repetitious music to the night air. There was movement and crowding all about, but the middle of the street was almost empty save for the busses. There were some bicycles but practically no other wheeled traffic. After all, Bootstrap was strictly a security town. A man could leave whenever he chose, but there were formalities, and personal cars weren't practical.
"Chief'11 be yonder," said Haney in Joe's ear. "Come along."
They shouldered their way along the sidewalk. The passersby were of a type—construction men. Somebody here had taken part in the building of every skyscraper and bridge and dam put up in a man's working life. They could have been kept away from the Space Platform job only by a flat security refusal to let them be hired.
Haney and Joe moved toward Sid's Steak Joint, with Mike the midget marching truculently between them. Joe marshalled in his mind what he was going to tell the
Chief. He had a trick for fixing the pilot gyros. A speck of rust would spoil everything, and they'd been through a plane crash and a fire and explosions, but his trick would do in ten days or less what the plant back home had needed four months to do. The trick was something to gloat over.
Into Sid's Steak Joint. A jukebox was playing. Over hi a booth, four men ate hugely with a slot TV machine in the wall beside them, showing wrestling-matches out in San Francisco. A waiter carried a huge tray, from which steam and fragrant odors arose.
There was the Chief, dark and saturnine to look at, with his straight black hair gleaming hi the light. He was a Mohawk, and he and his tribe had taken to steel con- -*i* struction work a long while back. They were good. There : were very few big construction jobs hi which the Chief's •*J* tribesmen were not concerned. Forty of them had died together in the worst construction accident in history, when a bridge on its way to completion collapsed in the making, but there were not less than two dozen at work _on the Space Platform. The Chief had essayed machine-tool work at the plant, and he'd been cherished. He pitched on the village baseball team, and he sang bass in the church choir, but there was nobody else to talk Indian to, and he'd gotten lonely. At that, though, the Space Platform job was calling, and wild horses couldn't have kept him from a job like that.
He'd held a table for Haney and Mike, but his eyes widened when he saw Joe. He grinned and almost upset the table to shake hands.
"Son-of-a-gun!" he~said warmly. "What are you doing here?"
"Right now," said Joe. "I'm looking for you. I've got a job for you."
The Chief, still grinning, shook his head.
"Not me! I'm here till the Platform goes up."
"That's the job," said Joe. "I've got to get a crew to repair something I brought out and that got smashed in the landing."
The four of them sat down. Mike's chin was barely
above the table-top. The Chief waved to a waiter, "Steaks all around!" Then he bent toward Joe. "Shoot it!"
Joe told i his story concisely. The pilot gyros, which had to be perfect, had been especially gunned for by saboteurs. An attempt with possibly stolen proximity fused rockets. The plane was bobbytrapped and

somebody'd armed the trap. There was a shipment aboard that—luckily—blew up hi midair when jettisoned. Trying a bellylanding, the plane had crashed and burned.
The Chief growled. Haney pressed Ms lips together. The eyes of Mike were hot and angry.
"Plenty of that sabotage stuff," growled the Chief. "Hard to catch the so-and-sos. Smash the gyros and the take-ofFU have to wait till new ones get made, and that's more time for more sabotage."
"I think it can be licked," Joe said carefully. "Listen a minute, will you?"
The Chief fixed his eyes upon him.
"The gyros have to be rebalanced," said Joe. "They have to spin on their own center of gravity. At the plant we set them up, spun them, and found which side was heavy. We took metal off until they ran smoothly at 500 r.p.m. Then we spun it at a thousand. It vibrated. We found unbalances too small to show up before. We fixed them. We speeded the gyros up again. And so on. JVe tried to make the center of gravity the center of the shaft by making the center of the shaft the center of gravity. See?"
The Chief said impatiently, "No other way to do it. No other way!"
"I saw one," said Joe. "When they cleaned up the wreck at the airport, they heaved up the crates with a hoist. The slings were twisted. Every crate but one spun as it rose. But not one wobbled! They found thek own center of gravity and spun around that!"
The Chief scowled, deep in thought. Then his face went blank.
"By the holy Hopi mud-turtle!" he grunted. "I get it!"
Joe said, with very great pains not to seem triumphant, "Instead of spinning the shaft and trimming the rotor, we'll spin the rotor and trim the shaft. We'll form the
, shaft around the center of gravity, instead of trying td; move the center of gravity to the center of the shaft.[/>] We'll spin the rotors on a flexible bearing-base. I think it'll work."
Surprisingly, it was Mike the midget who said warmly. "You got it! Yes, sir, you got it!"
The Chief took a deep breath.
"Yeah! And d'you know how I know? The Plant built a high speed centrifuge once. Remember?" He grinned. "It was just a round plate with a shaft in the middle. There were vanes on the under side of the plate. The shaft went in a hole that was away too big. But we blew compressed air up the shafthole. It floated the plate up, the air hit the vanes and spun the plate and it ran sweet as honey! Balanced itself and didn't wobble a bit. We'll do something like that!"
"I need a crew to work on it," said Joe. "Three or four altogether. I can ask for anybody I need. I'm asking for you. You pick the others."
The Chief grinned broadly.
"Any objections, Haney? You and Mike and me and Joe here? Look!"
He pulled a pencil out of his pocket. He started to draw on the plastic tabletop, and then took a paper napkin instead.
"Something like this...."
The steaks came, sizzling on the platters they'd beenj cooked in. The outside was seared and the inside was hot and really rare. Intellectual exercises like the designing] of a machine-tool operation could not compete with such aromas and sights and sounds. The four of them fell to.
But they talked as they ate, absorbed and with deepening satisfaction as the steaks vanished and the method they'd use took form in their heads. It wouldn't be wholly simple, of course. When the rotors were spinning around their centers of gravity, trimming the shaft would change the center. But the change would be infinitely less than trimming off the rotor's rim. If they spun the rotors and used an abrasive on the high side of the shaft as it turned...
" 'Going to have precision!" warned Mike. "Have to
have a polishing surface a quarterturn behind the cutter. That'll hold it."
Joe remembered afterward to be surprised that Mike knew gyro theory; at the moment he only swallowed quickly so he could get the words out.
"Right! And if we cut too far down we can plate the bearing up to thickness and cut it down again..."
"Plate it with irridium," said the Chief. He waved a steak-knife. "This is going to Be fun. No tolerance, Joe?"

"No tolerance/' agreed Joe. "Accurate within the limits of measurement."
The Chief beamed. The Platform was a challenge to all of humanity. The pilot gyros were essential to the functioning of the Platform. To provide that necessity against impossible obstacles was a challenge to the four who were undertaking it.
"Some fun!" repeated the Chief, blissfully.
They finished their steaks, talking. They consumed huge slabs of apple pie with preposterous mounds of ice cream on top, still talking urgently. They drank coffee, interrupting each other to draw diagrams. They used up all the paper napkins and were still at it when someone came heavily to the table. It was the stocky man who had fought with Haney on the Platform. Braun.
He tapped Haney on the shoulder. The four looked up.
"We hadda fight today," said Braun in a queer voice. He was oddly pale. "We didn't finish. You wanna finish?"
Haney growled. "That was a fool business," he said angrily. "That ain't any place to fight, up on the job! You know it!"
"Yeah," said Braun in the same odd voice. "You wanna finish it now?"
"I'm not dodgin' any fight." Haney said formidably. "I didn't dodge it then. I'm not dodgin' it now. You picked it. It was crazy! But if you got over the crazi-ness—" ' Braun smiled a remarkably peculiar smile. "I'm still crazy. We finish, huh?"
Haney pushed back his chair and stood up grimly.
"Okay, we finish it! You coulda killed me. I coulda killed you too, with that fall ready for either of us!"
"Sure! Too bad nobody got killed," said Braun.
"You fellas wait," said Haney angrily, to Joe and the rest. "There's a storeroom out back. Sid'll let us use it."
But the Chief pushed back his chair.
"Uh-uh," he said, shaking his head. "We're watchin' this."
Haney said with elaborate courtesy, "You mind, Braun? Want to get some friends of yours, too?"
"I got no friends," said Braun. "let's go."
The Chief went authoritatively to the owner of Sid's Steak Joint. He paid the bill, talking. The owner of the place nodded without excitement. It was not unparalleled for him to be asked for the use of that storeroom so two men could batter each other undisturbed. Bootstrap was a lawabiding town, because to get fired from work on the Platform was to lose a place on the most important job in the world. So it was necessary to settle quarrels in private.
The Chief leading, they filed out through the kitchen and out of doors. The storeroom lay beyond. The Chief went in and switched on the light. He looked about and was satisfied. The room was empty except for stacked cartons in one corner. Braun was already taking off his coat.
"You want rounds and stuff?" demanded the Chief.
"I want fight," said Braun thickly.
"Okay, then," said the Chief. "No kicking or gouging. A man's down, he has a chance to get up. That's all the rules. Right?"
Haney grunted assent as in his turn he stripped off his coat. He handed the coat to Joe. He faced his antagonist.
It was a curious atmosphere for a fight. There were merely the plank walls of the storeroom with a single dangling light in the middle and an unswept floor beneath. The Chief stood in the dorway, frowning. It didn't feel right to him. There was not enough hatred in evidence to justify it. There was doggedness and resolution enough, but Braun was deathly white, and his face was contorted—but not with the lust to batter and maul; it was something else.
The two men faced each other. And then the stocky, swarthy Braun swung at Haney. The blow had sting in it, but hardly more. It almost looked as if Braun were trying to work himself-up to the fight he'd insisted on finishing. Haney countered with a swing that glanced off Braun's cheek. And then they bored in at each other, slugging without science or skill.
Joe watched. Braun launched a blow that hurt, but Haney sent him reeling back. He came in doggedly

again, and swung and swung, but he had no idea of boxing. His only idea was to slug. He did. Haney had been peevish rather than angry. Now he began to glower. He began to take the fight to Braun.
He knocked Braun down. Braun staggered up and rushed. A wildly flailing blow landed on Haney's ear. He doubled Braun up with a wallop to the midsection. Braun came back, fists swinging.
Haney closed one eye for him. He came back. Haney shook him head to foot with a chest blow. He came back. Haney split his lip and loosened a tooth. He still came back.
The Chief said sourly, "This ain't a fight! Quit it, Haney! He don't know how!"
Haney tried to draw back, but Braun swarmed on him, striking fiercely until Haney had to floor him again. The stocky man dragged himself up and rushed at Haney and was knocked down again. Haney stood over him, panting furiously.
"Quit it, y'fool! What's the matter with you?"
Braun started to get up again. The Chief interfered and held him while Haney glowered.
"He ain't going to fight any more, Braun," pronounced the Chief firmly. "You ain't got a chance. The fight's over. You had enough."
Braun was bloody and horribly battered, but he panted. "He's got enough?"
"Are you out of your head?" demanded the Chief. "He ain't got a mark on him!"
"I ain't got enough," insisted Braun, "till he's got enough."
His breath was coming in soblike gasps, the result of bodyblows. It hadn't been a fight. It was a beating. But Braun struggled to get clear.
"You got enough, Haney." Mike the midget broke in. "You're satisfied. Tell him so!"
"Sure I'm satisfied," snorted Haney. "I don't want to hit him any more. I got enough of that!"
"Okay! Okay!" The Chief released the panting Braun and he went groggily to his coat. He tried to put himself in it. Mike caught Joe's eye and nodded meaningfully. Joe helped Braun into the coat. There was silence, except for Braun's heavy, labored breathing.
He moved unsteadily toward the door. Then he stopped.
"Haney," he said with effort," I don't say I'm sorry for fighting you today. I fight first. But now I say I'm sorry. You are good guy, Haney. I was crazy. I—got reason."
He stumbled out the door and was gone. The four who were left behind stared at each other.
"What's the matter with him?" demanded Haney blankly.
"He's nuts," said the Chief. "If he was gonna apologize—"
Mike shook his head.
"He wouldn't apologize," he said brittley, "because you might think he was scared. But when he'd proved he wasn't scared of a beating—then he could say he was sorry." He paused. "IVe seen guys I liked a lot less than him."
Haney put on his coat.
"I don't get it," he rumbled. "Next time I see him—"
"You won't," said Mike. "None of us will. I'll bet on it."
But he was wrong. The others went out of the storeroom and back into Sid's Steak Joint, and the Chief politely thanked the proprietor for the loan of his storeroom for a private fight. Then they went out into the neon lighted business street of Bootstrap.
"What do we do now?" asked Joe.
"Where are you sleeping?" asked the Chief hospitably, "I can get you a bunk at my place."
"I'm staying at the Shed," Joe told him awkwardly. "My family's known Major Holt a long time. I'm staying at his quarters behind the Shed."
Haney raised his eyebrows, but said nothing.
"Better get out there then," said the Chief. "It's midnight and they might want to lock up. There's your bus."
A lighted bus was waiting by the curb. Its doors were open, but it was empty of passengers. Single busses ran out to the Shed now and then, but they ran in fleets at shift change time. Joe went over and climbed in.
"We'll turn up early," said the Chief. "This won't be a shift job. We'll look things over and lay out what we want and then get to work. Right?"

"Right," said Joe. "And thanks."
Haney waved his hand. The three on the ground marched away, the two large figures of Haney and the Chief completely hiding Mike from tune to time. When seen, though, his air was truculent. They were a colorful trio, the reflection of all the many tinted signs upon them. They turned into a beer joint.
Joe sat in the bus alone. The driver was off somewhere. The sounds of Bootstrap by night were distinctive. Footsteps, and the jangling of bicycle bells; voices, a radio blaring somewhere and a recordshop loudspeaker somewhere else, over all a staccato noise of festivity.
There was a sharp rap on the glass by Joe's window. He started, and looked out. Braun, battered and bleeding from the corner of his mouth, motioned urgently for him to come to the door of the bus. Joe went.
Braun regarded him in a new fashion. Now he was neither dogged nor fierce nor desperate. Despite the beating he had taken, he looked completely and somehow frighteningly tranquil. He looked like somebody who has come to the end of torment and is past any feeling but that of relief.
"You," said Braun. "That girl with you today—her pop is Major Holt, eh?"
Joe frowned reservedly and said that she was.
"You tell her pop," said Braun, "you got hot tip. Hot
tip! Look two kilometres north of Shed tomorrow. Hej find something bad. Hot! You tell him. Two kilometres."
"Y-yes," said Joe, his frown increasing. "But look here—"
"Be sure say hot," repeated Braun.
Rather incredibly, he smiled. Then he turned andj walked away. And Joe went back to his seat in the empty bus. He sat there and waited for it fo start out to the Shed, and tried to figure out what the message meant. Since it was for Major Holt, it had something to do with security. And security meant defense against sabotage. And "hot" might mean merely "significant," but in these days, and here, it was likely to mean something else altogether. In fact, it might mean something to make the hair stand on .end when thought of in connection with the Space Platform. i
Joe continued to wait for the bus to start. He becamei convinced that Braun's use of the word "hot" did not! mean merely, "significant." The other meaning was un-1 doubtedly what Braun had in mind. 1
Joe's teeth tried to chatter. •
He didn't let them. ′•

6

MAJOR HOLT wasn't to be found when Joe got out to the Shed. And he wasn't in the officers' quarters area behind it. There was only his housekeeper, who yawned pointedly as she let Joe in. Sally was presumably long since asleep. Joe didn't know of any way to get hold of the Major, but he assured himself that Braun was a good guy. If he wasn't he wouldn't have insisted on taking a licking before he apologized. So Joe uneasily let himself be led to a room with a cot in it, and he was asleep in what seemed seconds. But he was badly worried.
In fact, he woke next morning at a practically unearthly hour, because Braun's message was on his mind. He was downstairs waiting when the housekeeper appeared. She looked startled.
"Major Holt?" he asked.
But the Major was gone. He must have done with no more than three or four hours sleep. There was an empty coffeecup whose contents he'd drunk before going back to the Security office.
Joe trudged to the barbedwire enclosure around the officers' quarters area, and explained to the sentry there where he wanted to go. A sleepy driver whisked him around the halfmile circle to the security building. There he found his way to Major Holt's office.
The Major's plain and gloomy secretary was already on the job. She led him in to Major Holt. He blinked at the sight of Joe.
"Hm.... I have some news," he observed. "We backtracked the parcel that exploded when it was dumped from the plane."
Joe had almost forgotten it. Too many other things had happened since.

"We've got two very likely prisoners out of that affair," said the Major. "They may talk. We didn't get the sandy haired man who helped fuel your plane, but emergency inspection of other transport planes has turned up three other grenades in wheel-wells, waiting to be armed at a later time. And other CO2 bottles have turned up to have something else in them. Very nice work!"
Joe said politely, "That's fine, sir."
"All in all, we've taken a loss in the gyros, but we've got a chance to forestall some other disasters. Did you find the men you were looking for?"
"I've found them, but—"
"I'll have them transferred to work under your direction," said the Major. "Their names?"
Joe gave them. The Major wrote them down.
"Very good. I'm busy now—"
"I've something to report," said Joe. "I think it should be checked right away. I don't feel too good about it."
The Major waited. And Joe explained, very carefully,
about the fight on the Platform the day before, Braun's insistence on finishing that fight in Bootstrap, and then the hot tip he'd given Joe after everything was over. He repeated the message exactly, word for word.
The Major, to do him justice, did not interrupt. He listened with an expression that varied between grimness and fatigue. When Joe ended he picked up a telephone. He talked briefly. Joe felt a reluctant sort of approval. Major Holt was not a man anybody could ever feel very close to, and the work he had to control was not likely to make him popular. But he did think straight and fast. He didn't think "hot" meant "significant," either. When he hung up the phone he said curtly;
"When will your workcrew get here?"
"Early," said Joe. "But not yet. A couple of hours, I'd think."
"Go with the pilot," said the Major. "You'll recognize what Braun meant as soon as anybody. See what you see."
Joe stood up.
"You think the tip is straight? It means something?"
- "Before now," said Major Holt detachedly, "a man has been blackmailed into trying sabotage. If he's got a family somewhere abroad, and they're threatened with death or torture unless he does such-and-such here, he's in a bad fix. It's happened. He can't tell me. He's watched. But sometimes he finds an out."
Joe was puzzled. His face showed it.
"He can try to do the sabotage," said the Major precisely, "after arranging to be caught at it. If he's caught, the blackmail threat is no threat at all so long as he keeps his mouth shut. Which he does. And—ah—you'd be surprised how often a man who wasn't born in the United States would rather go to jail for sabotage than commit it
—here."
Joe blinked.
"If your friend Braun is caught," said the Major, "he will be punished severely—officially. But privately someone will tell him that he'll be released from prison just as soon as he thinks it safe. And he will be. That's all."
He turned to his papers. Joe went out. On the way to meet the plane pilot who'd check on his tip, he thought
things over. He began to feel a sort of formless but very definite pride. He wasn't quite sure how he'd have expressed it, but it had something to do with being part of a country that men of wholly different upbringing could come to feel loyalty to. There can be a lot of things wrong with a nation, but if somebody from another one comes to feel that he'd rather be punished for a crime against that nation than commit it, well, it's not too bad a country to belong to.
As he went across the vast interior of the Shed, and past the shimmering growing monster which was the Space Platform, he had a security guard with him instead of Sally. He went all the way to the great swinging doors the materials trucks entered by. And there were guards here, and they checked each driver very carefully before they admitted his truck. But somehow it wasn't irritating. It wasn't scornful

suspicion. There'd be snide and snappy characters in the security force, of course. They'd swagger and throw their weight about. But even they were guarding something that men—some men—from very far away were willing to throw their lives away for.
Joe and his guide reached one of the entrances as a ten-wheeler truck came in with a load of shining metal plates. Joe's escort went through the opening with him and they went outside. The sun was barely risen. It looked huge but very far away, and Joe suddenly realized why just this spot had been chosen for the building of the Platform.
The ground was flat. All the way to the Eastern horizon there wasn't even a minor hillock rising above the plain. It was bare, arid, sunscorched desert. It was featureless save for sage and mesquite and the tall thin stalks of yucca blooms. But it was flat. It could be a runway. It was a perfect place for the Platform to start from. It shouldn't touch ground at all, after it was out of the Shed, but at least it wouldn't run into any obstacles on its way to the horizon.
A light plane came careening around the great, curved outer surface of the Shed. It landed and taxied up to the door. It swung smartly around and its sidedoor opened. A bandaged hand waved at Joe. He climbed in. The pilot
of this light, flimsy plane was the co-pilot of the transport ship of yesterday. He was the man Joe'd helped dump cargo.
Joe settled himself in the righthand seat. The small motor pop-pop-popped valiantly, the little plane rushed forward over hard-packed desert earth, and then went swaying up into the air. The co-pilot—pilot now—shouted cheerfully above the din;
"Hiya. You didn't sleep either? Burns hurt?"
Joe shook his head. "I was bothered," he shouted in reply. Then he added; "Do I do something to help, or am I just along for the ride?"
"First we take a look," the pilot called over the motor racket. "Two kilometres north of the Shed, eh?"
"That's right."
"We'll see what's there."
The little plane went up and up. At five hundred feet, nearly level with the roof of the Shed, it swung away and began to make seemingly erratic darlings out over the spotty desert land, and came back. Actually, it was a search pattern. Joe gazed down from his side of the cockpit. This was a very small plane indeed, and in consequence its motor made much more noise than more powerful engines in bigger ships.
'Those burns I got," shouted the pilot, staring down. "They kept me awake. So I got up and was just walking around when the call came for somebody to drive this thing. I took over."
Back and forth and back and forth. From five hundred feet in the early morning the range had a curious appearance. The plane was low enough for each smallest natural feature to be visible, and it was early enough for every shrub to cast a long, attentuated shadow. The ground looked streaked, but all the streaks ran one way, and all were shadows.
Joe shouted, "What's that?"
The plane banked at a steep angle and ran back. It banked again. The pilot looked carefully. He reached forward and pushed a button. There was a tiny impact underfoot. Another steep, banking turn, and Joe saw a puff of smoke in the air.
"It's a man." The pilot shouted. "He looks dead."
He swung over the object on the ground. There was a second puff of smoke.
"They've got rangefinders OH us from the Shed," he called across the two foot space separating him from Joe. "This marks the spot. Now we'll see if there's anything to the hot part of the tip."
He reached over behind his seat and brought out a stubby pole like a fishpole with a very large reel. There was also a headset, and something like a large aluminum fish on the end of the line.
"You know Geiger counters?" When Joe nodded, the pilot said; "Stick on these headphones and listen!"
Joe slipped on the headset. The pilot threw a switch somewhere and Joe heard clickings. They had no pattern and no fixed frequency. They were clickings at strictly random intervals, but there was a sort of average number per second, at that.
"Let the counter out the window," called the pilot. "Tell me if the clicks speed up."

Joe obeyed. The aluminum fish dangled. The line slanted astern from the wind. It made a curve between the pole and the aluminum plummet, it was hollow in the direction of the plane's motion. The pilot squinted down and began to swing in a wide circle around the spot where an apparent dead man lay, and above which puffs of smoke now floated.
Three-quarters of the way around, the random clickings suddenly became a roar. Joe said;
"Hey! That's it!"
The plane swung and flew back. The pilot pointed to the button he'd pushed.
"Poke that when you hear it again."
The clickings... . They roared. Joe pushed the button. He felt the tiny kick of the smoke-firing gun.
"Once more ..."
The plane swung in closer to where the dead man lay. Joe felt a sickening certainty that he knew who the dead man was. A sudden rush of noise in the headphones and he pushed the button again.
"Reel in now," shouted the pilot. "Our job's done."
Joe reeled in as the plane went back to the Shed. Puffs 1 of smoke floated in the air behind. They had been ranged | on at the instants they appeared. Somebody back at the | Shed knew that something needing investigation was at a | certain spot, and the two last puffs of smoke had said that 1 radioactivity was noticeable in the air where the puffs | floated. Not much more information would be needed. The ! meaning of Braun's warning that his tip was "hot" was definite, now. It was hot in the sense that it dealt with radioactivity.
The plane dipped and landed by the great doors again. It taxied up and the pilot killed the motor.
"We've been using Geigers for months," he said pleased-ly, "and never got a sign before. This time we were set!"
"For what?" asked Joe. But he knew.
"Atomic dust is a good guess," said the pilot. "It was talked of as a possible weapon away back. Ever hear of the Smyth Report? It's never been tried. We thought it might be tried against the Platform. If somebody managed to spread—say—some radioactive cobalt around all three shifts might be fatally burned before it was noticed. Maybe that was the notion here. But the guy who was | supposed to dump it opened up the can for a look. And i it killed him." |
He climbed out of the plane and went to the doorway, j He took a telephone from a guard there and talked crisp- > ly into it. He came back. *I*
"Somebody coming for you," he said amiably. "Wait J here. I'm gone. Be seeing you!" *I*
He got in the plane, the motor kicked over and caught, j and the tiny plane rushed away. Seconds later it was aloft and winging its way southward.
Joe waited. Presently something came clanking out of the Shed. It was a tractor with surprisingly heavy armor. There were men in it, also wearing armor of a peculiar sort which they were still adjusting. The tractor towecUa halftrack platform on which there was a hoist and a very considerable leadcoated bin with a top. It went away briskly to the north.
Joe understood. The vehicle and the men were armored
against radioactivity. They would approach the dead man from upwind and scoop up his body and put it in the leaden box, and with it all deadly radioactivity material near him. This equipment had handled an atomic bomb when a phony colonel tried to deliver it to the Shed. It had been ready for that emergency. It was on hand for this. Somebody had tried to think of every possible way by which the destruction of the Platform might be attempted.
A guard came for Joe and took him to where the Chief and Haney and Mike waited by the still incompletely opened crates containing the pilot gyros. They had some new ideas about the job on hand. New problems appeared as the gyro assemblies were uncovered. Some of the discoveries were heart rending. But Joe only made notes of the parts which could be replaced within the time available in which to re-balance the rotors, and those others which couldn't be, but must.
"This is a mess!" said Haney mournfully as they worked. "It'll be two days just cleaning up!"
The Chief eyed the rotors. There were two of them, great four-foot disks with extraordinarily short and stubby shafts. The ends of the shafts were beautifully polished cones, fitting with unbelievable precision into conical

sockets, which were intricately scored to form oil-channels. In operation, very special silicone oil would be pumped into the bearings under high pressure. Distributed by the channels, the oil would form a film which by its pressure held the moving metal shafts from actual contact with the bearings that supported them. The rotors, in fact, would be floated on oil just as the high-speed centrifuge the Chief had mentioned, floated on compressed air. But they had to be perfectly balanced, because any imbalance would make the shaff pierce the oilfilm. And metal-to-metal contact is undesirable in anything revolving at 40,000 revolutions per minute. The shafts and ^parings would burn whitehot in fractions of a second and there would be the devil to pay.
"We got to spin it hi a lathe," said the Chief profoundly, "to hold the chucks. The chucks have got to be these same bearings, because nothing else will take the
speed. And we got to cut out and splice the lathe's bedplate to make room for the rotors. And we got to do our spinning with the shaft lined up with the earth's axis."
Mike nodded wisely, and Joe knew he'd pointed that out. It was true enough. A highspeed gyro could only be run for minutes if its mount were fixed in any other direction. If a precisely mounted gyro had its shaft pointed at the sun, for example, while it ran its axis would try to follow the sun. It would try not to turn with the Earth, and it would wreck itself. And they'd have to use the same conebearings, but to protect the fine chan-nelings for oil they'd have to use coneshaped shims at the beginning while running at low speed. The coneends of the shaft would need new machining to line them up. And the bearings had to be mounted so that rotor could find its own center of gravity.
They'd used up many paper napkins the night before, merely evisioning these problems. Now new ones turned up as the crates and burnt packing came away.
They worked for hours, clearing away soot and charred stuff, Joe's list of small parts to be replaced from the home plant was as long as his arm. The motors of course had to be scrapped and new ones substituted. Considering their speed—at operating rate the field strength was almost nonexistent—they had to be built anew, which mean around-the-clock work at Kenmore.
A messenger came for Joe. The security office wanted him. Major Hqlt's gloomy secretary did not look up as he entered. Major Holt himself looked more tired then before.
"There was a man out there," he said curtly. "I think it was your friend Braun. I'll get you to look and see."
Joe had suspected as much. He waited.
"He'd opened a container of radioactive cobalt. It was extremely fine powder. There was half a pound of it. It killed him."
"Radioactive cobalt," said Joe.
"Definitely! Half a pound of it gives off the radiation of an eighth of a ton of radium. He'd undoubtedly been instructed to go get up as high as he could and dump the powder in the air. Finely divided as it was, it would
diffuse almost like a gas. It should have contaminated all the Shed past any possible use for years, —let alone killing everybody in three shifts."
Joe swallowed.
"He was burned."
"He had the equivalent of two hundred fifty pounds of radium within inches of his body," the Major said unbendingly," and naturally it wasn't healthy. For that matter, a mere berylh'um can wasn't much protection. Once he'd carried it in his pocket for a very few minutes, he was a dead man, even if he didn't know it."
Joe knew what was wanted of him.
"You want me to tell you if he's the man who gave me the tip."
The Major nodded.
"And then I want you to get a radiation check. On yourself. It's hardly likely he was—ah—carrying the stuff with him last night in Bootstrap. But if he was you may need—ah—some precautionary treatments. You and the men who were with you."
Joe realized what that meant. Braun had been given a relatively small container of the deadliest available radioactive substance on Earth. Milligrams of it, shipped from Oak Ridge for scientific use, were encased in thick lead boxes. Braun carried two hundred and fifty grams, two hundred fifty thousand times as much,

in a container he could put in his pocket. He was not only a walking dead man under such circumstances. He was also death to those who walked near him.
"Somebody else may have been burned in any case," said the Major detachedly. "I am going to issue a radioactivity alarm and check every man in Bootstrap for burns. It is very likely that the man who gave it to Braun is burned, too. But you will not mention this, of course."
He waved his hand in dismissal. Joe turned to go. The Major added grimly. "I said we'd found three other planes boobytrapped. The total is now eight. But the men who did the boobytrapping have vanished. They disappeared suddenly during last night. They were warned. Have you talked to anybody about it?"
"No, sir," said Joe.
"I would like to know," said the Major coldly," how they knew we'd found out their trick!"
Joe went out. He felt cold at the pit of his stomach. He was to identify Braum. Then he was to get a radiation check on himself. In that order. He was'to identify Braun first, because if Braun had carried a half-pound of radioactive cobalt on him in Sid's Steak Joint the night before, Joe was going to die. And so was Haney and the Chief and Mike, and anybody else who'd passed near him. So Joe was to do the indentification before he was disturbed by the information that he was dead.
He made the identification. Braun was very decently laid out in a leadlined box, with a leadglass window over his face. There was no sign of injury except from his fight with Haney. The radiation burns were deep, but they'd left no marks of their own. He'd died before outer symptoms could develop.
Joe signed a certificate. He went to be checked for his own chance of life. It was a peculiar sensation. The most peculiar part of it was that he wasn't afraid. He was neither sure that he was not burned inside, nor sure that he was. He simply wasn't afraid. Nobody ever really believes that he is going to die in the sense of ceasing to exist. The most arrant coward, stood against a wall to be shot or strapped hi an electric chair, finds that he very surprisingly does not believe that what happens to his body is going to kill him, the individual. It is why a great many people die with reasonable dignity. They know it is not worth making too much of a fuss over.
But when the Geiger counters had gone over him from head to foot, and his body temperature was normal, and his reflexes sound, when he was assured he was safe, then Joe felt weak in the knees. And that, too, was nat-tural.
He went trudging to the wrecked gyros. His friends were gone, leaving a scribbled memo for him. They were gone to pick out the machine-tools for the work in hand.
He continued to work over the wreckage, thinking of Braun. He felt an icy dislike for the people who were responsible for Braun's death, as part of a design to murder
all the working-force on the Platform. His dislike was much deeper than anger. It was backed by everything he believed in and everything he'd ever wanted and everything he hoped for. And anger could cool off, but the way he felt never would. He thought about it as he worked, with all the noises of the Shed about him.
A voice said, "Joe."
He started and turned. Sally stood behind him, looking at him very gravely. She tried to smile.
"Dad told me," she said, "about the checkup that says you're all right. May I congratulate you that you're going to be with us for a while? That—that the cobalt didn't get near you? Or the rest of us?"
Joe didn't know exactly what to say.
"I'm going inside the Platfrom," she told him. "Would you like to come along?"
He wiped his hands on a piece of waste.
"Naturally! My gang is off picking out tools. I can't do much until they come back."
He fell into step beside her. They walked toward the platform. And it was still magic, no matter how often Joe looked at it. It was huge beyond belief. Its bright plating shone through the gossamer scaffolding all about it. There was always a faint bluish mist in the air, and there were the marshlights of welding torches here and there. The sounds of the Shed were a steady tumult in Joe's ears. He was becoming used to them, though.
"How is it you can go around so freely?" he asked. "I have to be checked and rechecked."
"You'll get a full clearance," she told him. "It has to be through channels. Me, I have influence. I always

come hi through security, and I have the door-guards trained. And I do have business in the Platform."
He turned his head to look at her.
"Interior decoration," she explained. "And don't laugh! It isn't prettifying. It's psychology. The Platform was designed by engineers and people with sliderules. They made a beautiful environment for machinery. But there will be men living in it, and they aren't machines."
"I don't see—"
"They designed the hydroponic gardens," said Sally
with a certain scorn. "They calculated neatly that eleven square feet of leaf-surface of a pumpkin-plant will purify all the air a resting man uses, —returning Jhe COz as broken down to carbon and oxygen, and so much more will keep fresh the air a man uses when he's working hard. So they designed the garden to produce the greatest possible leaf surface of pumkin plants! They figured food would be brought up by the tender-rockets! But can you imagine the men in the Platform, floating in emptiness, living on dehydrated food and stuffing themselves hungrily with pumpkins because that was the only honest, fresh stuff they'd have?"
Joe saw the ironic angle.
"They're thinking of mechanical efficiency!" said Sally indignantly. "I don't know much about machinery, but I've wasted an awful lot of tune at school and elsewhere if I don't know something about human beings! I argued, and the garden won't be as efficient as an air purifying system—air renewal if you like! But it'll be a nice place for a man to go into. He won't smell pumpkin plants all the time, either! I've even gotten them to include some flowers!"
They were very close to the Platform, and it was very close to completion. Joe looked at it hungrily, and he felt a great sense of urgency. He tried to imagine the scaffolding away and the Platform floating free in space, with white-hot sunshine glinting on it and only a background of unwinking stars. But there would be nearer, darting, envious fellow satellites in orbits usually far below it. They were queerly shaped, those smaller and earlier satellites, ranging from the very first Sputnik to circle Earth, to the commercial television satellites which were not quite as satisfactory as man had hoped.
Sally's voice went on; "And I did put up an argument about the living quarters! They had every interior wall painted aluminum! I argued that in space or out of it, when people have to live somewhere it's housekeeping. This is 'going to be their home. And they ought to feel human in it!"
They passed into one of the openings in the mass of uprights. All about them there were trucks and puffing
engines and hoists. Joe dragged Sally aside as a monstrous truck-and-trailer came from where it had delivered some gigantic item for interior use. It rumbled past them, and she led the way, and there was a flight of temporary wooden stairs with two security guards at the bottom. Sally spoke to them, and they grinned and waved for Joe to go ahead. He went up the stairs which would obviously be removed before the Platform's launching. He found himself actually inside the Platform for the first time.
It was a moment of vivid emotions. Within the past twenty four hours he'd known shame and danger, and only a little while since he'd come to think detachedly of death for himself, and then had learned that he could live for a long while yet. He knew that Sally had been scared, at least on his account, and that her matter-of-fact manner was partly assumed. She was at least as much churned up inside as he was.
And this was the very first time he was inside what was to be the first manned spacecraft ever to leave the Earth on a nonreturn journey.

7

NOBODY COULD have gone through the emotions Joe had known in one day and night, and remained exactly his usual self. Seeing a dead man who'd killed himself so he wouldn't have to kill Joe—for one—had its effect. Knowing that he might have killed Joe without Joe knowing it had had its results. To be checked for radiation burns which might mean he'd die quite comfortably very soon was a disturbing experience. And Sally—Sally'd been exposed to the danger of radioactive cobalt. But she didn't find it out until it was over. She'd been scared much more on his account than on her own. He was acutely aware of the fact. When on top of all the rest, he found himself in the Space Platform, Joe was definitely keyed up.

Therefore he did not talk about it. He talked technology instead. He examined the Platform's inner skin and its lining, almost at the temporary entrance. The plating of the Platform was actually double. The outer layer was a meteor bumper against which particles of cosmic dust could strike and explode without damage inside. They could even penetrate it without causing a leak of air. Between the skins there was glasswool for heat insulation. Inside the glasswool a layer of material served exactly the function of the coating of a bullet-proof gas tank. Even at meteoric speeds of up to forty-five miles per second, no meteorite under a quarter of an inch could hope to make a puncture. But if one did, the selfsealing layer would stop the leak immediately. Joe could explain the protection of the metal skins. He did.

"When a missile travels more than so fast," he said jerkily white thinking of something else entirely," it doesn't gain in ability to punch a hole. Over a mile a second, impact can't be transmitted from the front of a bullet to the back. The back end of such a bullet arrives at the hit place before the shock of collision can reach it. It's like a train in a collision. It doesn't stop all at once. A meteor hitting the Platform will telescope on itself like the cars of a railroad train that hits another at full speed."

Sally listened enigmatically.

"So," said Joe," the punching effect isn't there. A meteor hitting the Platform will explode. It will blow away as much of the plating as its own mass, but no more. Weight for weight, pea soup would be as effective armor against meteors as hardened steel."

"Dear me!" Sally said. "You mustread the newspaper articles!"

"And the math figures out that the Platform shouldn't get an actual meteor-puncture in the first twenty thousand years its floating around the Earth."

"Twenty thousand two-seventy, Joe," said Sally. She was trying to tease him, but her face showed strain. "I read the articles too. In fact I sometimes show the
article writers around, when they're cleared to see the Platform."

Joe winced.

"You know more about it than I do! That cuts me down to size, doesn't it?"

She smiled at him. But they both felt queer. They went on deeper into the interior of the huge spacecraft.

"There's lots of space," said Joe. "It could have been smaller."

"It'll be ninetenths empty when it goes up," said Sally.

Somehow they didn't seem to fit together, now. Joe needn't have tried to lecture Sally on the Platform, and she needn't have made him see so clearly that he'd talked too much. The emptiness of the Platform when it went aloft was totally unlike the other, lesser satellites. They were built into rockets. They had to get aloft with fuel they carried themselves, and an enormous proportion of that fuel was used simply to pierce the atmosphere. They had to be stramlined and small because of air resistance. But the Platform didn't. It would gain little by being shaped to cut thin air, and it would lose a lot. The method planned for its launching allowed it to be large and light and dodged most of the reasons for making small the space capsules in which astronauts repetitiously shot upward to make, circles around the Earth. But they were almost squabbling over it.

Joe closed his mouth firmly. Sally was the only person in the world who would judge him by what he tried to do instead of what he accomplished. That backlog of approval wasn't to be risked for the sake of showing off. He shut up.

They reached the engineroom. This had nothing to do with driving power for the Platform. It was where the engines that made the Platform inhabitable were centered. Here were the service motors and the aircirculation system and the fluid pumps. Off the engineroom the main gyros were already installed. They waited only for the pilot gyros to be mounted, to control them as a steering engine controls an ocean ship's rudder. Joe looked at the main gyros. They were familiar from their working draw-
ings. But he let Sally walk on and went with her, without trying to stop and look exhaustively.

Then she showed him the living quarters, and he began to guess that she needed approval too.

The crew's quarters centered in a great open space quite sixty feet long and twenty wide and high. There were bookshelves, and two balconies, and chairs. Private cabins opened from it at different levels, but there were no steps to them. Yet there were chairs with straps so that when weightless one could fasten himself in them. There were ashtrays, ingeniously designed to look like ashtrays and nothing else. But ashes would not fall into them when the Platform was in space; they would be drawn and caputured by air-suction. There was an unpatterned carpet on the floor and on the ceiling.

"It's going to feel queer," said Sally, almost defensively, "but it will look fairly normal. I think that's

important. This room will look more like a big private library than anything else. One won't be reminded every second, by everything he sees, that he's living in a strictly synthetic environment. He won't feel cramped. If all the rooms were small, a man would feel as if he were in prison. At least this way he can pretend he isn't."

Her mind wasn't wholly on her words. She'd been frightened, for Joe. She wanted to matter to him. She tried to claim his interest on his own level and through the things he found absorbing.

"Sleeping will be the big problem," she said.

He nodded. There was a momentary pause. They were simply looking about the great room. Sally stirred uneasily.

"You've been in an elevator that started to drop like a plummet. When the Platform is orbiting, it'll be like that. Nothing will have any weight. Do you think, Joe, that if you were in an elevator that seemed to be dropping and dropping and dropping for hours on end—do you think you could go to sleep?"

Joe frowned. He hadn't thought much about that. He shook his head.

"You might adjust to it when awake," said Sally, "but
getting used to it asleep would be something else. You've dreamed you were falling and woke with a start."

"Sure!" said Joe." Then he whistled. "I see! You'd drop off to sleep and you'd be falling. So you'd wake up. Everybody in the Platform will be falling every minute— or they'll *feel* that way."

He didn't see the answer. There'd been stories of medication to enable astronauts to endure hours or days of weightlessness in orbit. He didn't know if they were true. But falling is the first fear a human ever knows. It is inborn. And no matter how thoroughly a man might know in his conscious mind that weightlessness was normal in the Space Platform, his conscious mind would go offduty when he went to sleep. A completely primitive subconscious might take over, and it would not be satisfied. It might wake him frantically whenever he dozed, until he cracked up from insomnia, and might let him sleep only when exhaustion came.

"That's a tough one," he said disturbedly. "There's not much to be done about it."

"I suggested something," said Sally, "and they've built it and I hope it works!" She explained carefully, watching his face for approval. "It's a bunk with a top that straps down to an inflatable mattress. When a man wants to sleep he'll get into it and inflate the mattress. It'll hold him hi his bunk, and press on him gently from all around."

Joe was anxious to express approval. He didn't like the fact that they both seemed nervous.

"It'll be like a man swimming," he suggested. "One can go to sleep floating. There's no sensation of weight, but there's pressure all about. A man might be able to sleep if he felt like he was floating in water. Yes. That's a good trick, Sally! It'll work! If you feel like you're floating, you won't feel like you're falling! That's good stuff!"

Sally seemed to relax a little.

"I thought of it another way," she said. "When we go to sleep we're like babies, I tried one of those bunks. It feels sort of dreamy, as if someone were holding one quite safe. As if one were a baby and beautifully secure."

Then she turned abruptly and showed him the kitchen. Every pan was covered. The top of the stove was alnico
strips, arranged rather like the top of a magnetic chuck. Pans would cling to it. And the covers had a curious flexible lining Joe couldn't understand.

"Teflon plastic," said Sally. "It doesn't melt or burn. Inflated, it holds the food down to the hot bottom of the pan. It was planned for the crew to eat ready prepared food. I said it would be bad enough to have to use new tactics in eating. So they hung one of these stoves upside down for me, and I cooked bacon and eggs and pancakes with the cover of the pan pointing to the floor. They said the psychological effect would be worth while."

Joe was stirred. He'd been made uneasy because they'd talked for minutes, when they first came in the Platform, without the cordiality he'd come to depend on. But now he was impressed. He was admiring.

"That's swell, Sally," he said. "You must be the first girl in the world to think about housekeeping in space."

"Girls wilj be going onto space, won't they?" she asked, not looking at him. "If there are colonies on the other planets, they'll have to! And some day to the stars . . ."
, She stood quite still, and suddenly there was no more tension between them, and Joe wanted to do something about his admiration for her and the way he felt. The interior of the Platform was silent. Somewhere far away the glasswool insulation was incomplete and the sound of workmen was audible, but the inner corridors of the Platform were not resonant. They were lined with a material to destroy reminders that this was merely a metal shell, an artificial world, when it was out in emptiness. Here and now, Joe and Sally were alone, and he felt a sense of urgency.
He looked at her yearningly. Her color was a little higher than usual. She was a nice kid. He'd noticed it before, but now with an unexpressed tension somehow relieved, and with the memory of her fright because he'd been in danger... He remembered her absurd offer to cry for him if he felt badly over the gyros' smashing.
He found himself twisting at the ring on his finger. He got it off, and there was some soot and grease on it, from the work he'd been doing. He knew she knew what he was about, but she looked away.
"Look, Sally," he said awkwardly. "We're known each other a long time. I—like you a lot. And I've got some things to do first, but—" He stopped. He swallowed. She turned and looked at him, not quite gravely and not quite smiling. "Look," he said desperately, "what's a good way to ask if you'd like to wear this?" She nodded, her eyes shining. "That was a good way, Joe. I'd like it a lot." There was an interlude, then, during which she very ridiculously cried and explained that he must be more careful and not risk his life so much! And then there was a faint, faint sound outside the Platform. It was the yapping sound of a siren, crying out in short and choppy howlings. Then its note steadied and it wailed and wailed and wailed.
"That's the alarm," said Sally. She was misty eyed. "Everybody out of the Shed. Come on, Joe."
They started back the way they'd come in. And Sally looked up at Joe and grinned suddenly.
"When I have grandchildren," she told him. "I'm going to brag to them that I was the very first girl in the world to be kissed in a spaceship!"
But before Joe could do anything about the statement, she was out on the stairs, in plain view and going down. So he followed her.
The Shed was emptying. The bare, woodblock floor was dotted with figures moving steadily toward the security exit. There was no hurry, because security men were shouting that this was not an alarm but a precautionary measure, and there was no need for haste. They had been informed by the miniature walkie-talkies they wore as a matter of course. By these they could receive orders or statements to make either on the floor of the Shed or anywhere on or in the Platform itself.
Trucks lined up in an orderly fashion to go out the swingup doorways. Men came down from the scaffolding after putting their tools hi proper betweenshift positions for counting and inspection. Other men were streaming comfortably from the pushpot assembly-line. Except for the gigantic object in the middle, and the fact that every man was in workclothes, the scene was surprisingly like
the central waiting-room of a very large railroad statioi| with innumerable people moving briskly for trains.
"No hurry," said Joe, catching the word from a curity man as he passed it on. "I'll go see what my gangfj found out."
The trio—Haney and the Chief and Mike—were jv arriving by the piles of charred but now uncovered wrec age. Sally flushed ever so slightly when she saw the eye Joe's ring on her finger.
"Rest of the day off, huh?" said the Chief. "Look! found most of the stuff we need. They're gonna give a shop to work in. We'll be able to get set up in the^j mornin' and get goin'. Have you got the partslist off tol the plant for your folks to get busy on?" |
Sally said quickly, "He's sending that by facsimile. Then—"
The Chief beamed, in benign mockery, "What' you going to do after that, Joe? If we get the rest of the day off."
Sally said hurriedly, "We were—he was going off on ,a picnic with me. To Red Canon Lake. Do you really need to talk business all afternoon?"
The Chief laughed. He'd known Sally at least by sight back at the Kenmore plant.
"No ma'am," he told her. "Just asking. I worked on-'j that Red Canon job, years back. I worked on the dam % that made the lake. It ought to be pretty around there j now. Okay, Joe. See you when work starts again. In the,.| morning, most likely." |

Joe started away with Sally. Mike called, "Joe! Just | a minute!" !
Joe went back. The midget's seamed face was very earnest.
"Something to think about." He said in his odd voice. "Somebody worked pretty hard to keep you from getting this stuff here. They're not likely to figure you can fix it. But if they find out we've got a special shop assigned to us, maybe they'll think they ought to take measures."
"Hm. Yes," said Joe. "You three had better watch out."
Mike stared at him and grimaced. "You don't get it," he , said. "All right! I may be crazy, at that."
Joe rejoined Sally. The idea of a picnic was brand new, but he approved of it completely. They went on to the small exit that led to the security building. They were admitted. There was remarkable calm and efficiency, here, even though routine had been upset by the order to stop all work. As they went up toward Major Holt's office, Joe heard somebody dictating in a matter-of-fact tone.
".. the attempt at atomic sabotage was defeated outside the Shed entirely, but it had no chance of success. Geiger counters would have revealed any attempt to smuggle radioactive material into the Shed . .."
They went on. Joe said, "That sounds like somebody dictating a publicity release."
"It probably is," agreed Sally. "The statement's true, too, about the Geiger counters. Only they use scintillators now. They'll show up a radiumdial watch twenty feet away."
Joe nodded. "I've got to get my stuff off on the facsimile machine," he said.
But he had to get Major Holt's secretary to show him how to feed the list of small parts required. It would go East to the facsimile receiver nearest the plant, and then be rushed to the plant by special messenger. Miss Rose gloomily set the machine, initialed the delivery requisition which was part of the documentation, and the partslist flashed through the machine and came out again.
"You and Sally," said the Major's Secretary, morbidly, "can go and relax this afternoon. But there's no relaxation for Major Holt. Or for me."
"I'm sure Sally'd be glad if you came with us." Joe suggested unenthusiastically.
Major Holt's plain secretary shook her head. "I haven't had a day off in more than a year," she sighed. "The Major depends on me. Nobody else could do what I do! You're going to Red Canon Lake?" "We thought it might be pleasant," said Joe. "It's terribly dry and arid here," said Miss Rose. "That's the only body of water in a hundred miles or more. I hope it's pretty there. I've never seen it."
She handed back Joe's list. An exact copy of it, in his handwriting, was in existence a good fifteen hundred miles
away, now, and another exact copy would reach the Ken- | more plant within the hour. And there could be no errors '| in transmission.
Sally came out of her father's office, smiled at Miss 5 Rose, and led Joe down to the entrance.
"I have the car," she said cheerfully, "and there'll be a lunchbasket waiting for us at the house. I agreed that the lake was too cold for swimming, Joe. It is. Snowwater feeds it. But it's nice to look at.
They went out the door, and the workers on the Platform were just coming out to pile hi the arriving fleet busses. But the black car was waiting, too. Joe opem the door and Sally handed him the key. She regardi the men swarming hi the busses.
"There'll be bulletins all over the Bootstrap," she o served, "saying some radioactive cobalt has been foun and everybody'd better get a radiation check. Braun coul have carried it around and some people would be burm a little and some a lot. But you'd have gotten it badly. So, maybe nobody else was harmed. Braun probably didn't carry it around. If anybody is burned, it'll be the man who delivered it."
Joe started the car. He swung out and around the Shed. They stopped at the Major's quarters to pick up the lunchbasket the Major's housekeeper had packed on telephoned instructions. They drove away. Red Canon was eighty miles from the Shed, and the only highway to it went through Bootstrap. It was already filled with busses, however, which on an unscheduled run like this ran with less of decorum than usual. Joe, driving the black | car, could hardly make better tune than the busses them- % selves. !;
They went through the town and its peculiar wheeled traffic which was almost entirely bicycles. On the far side there was a security checkpoint. Here Sally's pass was | good. They went rolling on and on through an empty, | arid, sunbaked landscape toward the hills to the west. | It looked remarkably lonely. Joe thought for the first .| time about gas. He looked carefully at the gauge. !

Sally shook her head. "Don't worry! The tank is full. Security takes care of that. When I said where we were
going and that I wanted the car, Dad had everything checked. If I live through this, I'll bet I'm a fanatic about caution all the rest of my life!"
"I suppose it gets to everybody." Joe said. "Mike—the midget, you know—called me back to suggest that the people who got the gyros spoiled might try to spoil the four of us so we couldn't try to make repairs."
"That's extreme," said Sally firmly. "They can't know you think it can be done! But the strain tells on everybody. You've noticed that Dad's getting gray. That's worry. And Miss Rose is about as tense. Things leak out hi the most remarkable way, and Dad can't find out how! Once there was sabotage and he could have sworn that nobody had the information to permit it but himself and Miss Rose. She had hysterics. She insisted that she wanted to be locked up somewhere so she couldn't be suspected of telling anybody anything. She'd resign tomorrow if she could. It's ghastly!" Then she hesitated and smiled faintly. "In fact, just against a million-to-one chance this afternoon—"
He took his eyes off the road to glance at her. "What?"
"I promised we wouldn't go swimming and," she paused, awkwardly. "There are two pistols in the glove compartment. Dad knows you. I promised you'd put one in your pocket up at the lake."
Joe drew a deep breath. She opened the glove compartment. He took out a pistol and glanced at it. .38 hammer-less. A good safe weapon. He put it in his pocket. But he frowned.
"I was looking forward to not worrying about anything," he said wryly, "but now I'll have to remember to look over my shoulder ah" the time."
"Maybe," suggested Sally, "you can look over my shoulder and I'll look over yours, and we can glance at each other occasionally."
She laughed, and he managed to smile. But the trace of a frown remained on his forehead.
They drove and drove and drove. Once they came to a very tiny town. It may have contained as many as a hundred people. There were gaspumps and two or three
general stores, which were certainly too many for the permanent residents to support. But there were also a few cowponies hitched to hitchingrails, and there were automobiles also in view. The ground here was slightly rolling. The mountains had grown to good-sized ramparts against the sky. Joe drove carefully through the single street, turning out widely hi the very center of the town to dodge a dog sleeping placidly in the highway.
They went on. Now the car dragged up a trail of white behind it, where dust had blown upon the road and swirlex up furiously when disturbed.
They reached the foothills, and then the road curvec and curved again as it wound among them. Joe had drivei a full two hours before they reached the dam. Then thei came upon it from downstream, and it was an enormous structure of masonry, far from any other sign of civiliza tion except the highway. From it's top a plume of falling water leaped.
"The dam's for irrigation," said Sally professionally, "but the water's used a long way from here. And the ^Platform gets all its power from here. One of Dad's nightmares is that somebody might blow up the dam and leave Bootstrap and the Shed without power."
Joe said nothing. He drove on up the trail as it climbed the canon wall in hairpin slants. It was ticklish driving. But then, quite suddenly, they reached the top of the canon wall, and the top of the dam and the level of the lake at once. Here there was a sheet of water that reached away among rocky hillsides for miles and miles. It twisted out of sight. There were young trees. There were small waves on its surface, and grass at its edges. The powerhouse was a squat structure in the middle of the dam. Nobody was visible anywhere.
"Here we are," said Sally when Joe stopped the car.
He got out and moved to open the door for her, but she was already stepping out with the lunchbasket when he arrived. He reached for it and she held on, and they moved companionably away from the car carrying it between them.
"There's a nice place," said Sally, pointing.
A small ridge of rock reached out into the lake. It

formed what was almost an island perhaps fifty feet across. There were some small trees. They went toward it. They descended the slope and out the rocky isthmus that connected it with the shore.
Sally let down the lunchbox on a stone and laughed for no reason at all as the wind blew her hair about. It was a cool wind from over the water. And Joe realized with a small shock of surprise that the air felt differently and smelled newer when it blew over open water like this. Up to now he hadn't realized the dryness and the des-sication of the air hi Bootstrap and around it.
The lunch-basket tilted. Joe set it more firmly.
"Hungry?"
There was literally nothing on his mind at the moment except the luxurious, satisfied feeling of being off somewhere with grass and a lake and Sally, and a good part of the afternoon to throw away. It felt good. So he lifted off the lid of the lunchbasket.
There was a revolver on top of the lunch. It was the other one from the glove compartment of the car. Sally hadn't left it behind. Joe regarded it and said ironically;
"Happy, carefree youth—that's us! Which are the ham sandwiches, Sally?"

8

NEVERTHELESS, the afternoon began splendidly. Joe dunked the bottled soft drinks in the lake to get cold, and they ate and talked and laughed occasionally, and did more of both than either could have imagined beforehand. Joe, in particular, had more than the usual capacity for enjoyment today. He'd been through many times the amount of turmoil that would have been normal, and now things began to look better. And there was the com-
pletely tacit arrangement with Sally, which had a solid sort of satisfactoriness about it. If Sally had been homely, Joe would have liked her enormously to talk to and to be with. But she was pretty enough for him to enjoy looking at her. So he'd have felt a warm interest in her if she hadn't been interested in him at all—but she was wearing his ring. She'd wrapped some string around the inside of the band to make it fit. So that just being where she was would have made him feel on top of the world anyhow.
The only trouble was that now and again he was conscious of an unusually heavy weight hi his righthand coat-pocket. And that meant that there was a nagging sort of worry in the back of his mind, too.
But they spent at least an hour in the sort of contented, satisfying, meaningless loafing that nobody can describe but everybody likes to remember. From time to time Joe remembered to look ashore. Mostly, of course, when the weight hi his pocket reminded him.
But he didn't look often enough. He was pulling the chilled soft drink bottles out of the hike when he saw a movement out of the corner of his eye. He whirled.
It was the Chief, with Haney and Mike the midget close behind. They came striding out the small peninsula from the shore.
Haney asked sharply, "Everything okay?"
"Surely!" said Joe. "Everything's fine! What's the matter?"
"Mike had a hunch," said the Chief, "and—uh—I remembered I worked on the job when this dam was built twelve-fifteen years ago." He looked about him. "It was different then."
Then he caught Joe's eye and jerked his head almost imperceptibly to one side. Joe caught the signal.
"I'll see about some more soft drinks," he said. "Come help me fish up the bottles, Chief."
Sally smiled at the other two. She was already inspecting the lunch-basket.
"We still have some sandwiches," she said hospitably, "and some cake."
Haney advanced awkwardly. Mike moved with some-
thing of truculence. Joe knew what was in his mind. If Sally treated him like a freak ... But Joe knew with deep satisfaction that she wouldn't. He went down to the water's edge.
"What's up, Chief?" he asked in a low tone. "Mike hadda hunch," rumbled the Chief. "Somebody tried to smash the stuff you brought. They did. But we started getting set to fix it. So what'd they do? Knock us off. They wouldn't mind! If they were willing to atomdust the whole Shed and everybody in it, they wouldn't stop at four more murders. Or five."
Joe fished for a popbottle under water. "Mike hinted at that," he observed. "But it seemed pretty

farfetched."
"Yeah. It does. But you were the one who figured things out. You'd be first target. Haney and Mike and me—there wouldn't be much gained by killing us. But you and her headed off by yourselves. Mike figured you mightn't be safe."
Joe brought up one bottle and then another. "We're all right. We haven't seen a soul." "That don't mean nobody's seen you," growled the Chief. "A car left Bootstrap twenty minutes behind you. There were three guys in it. It's parked down below the dam, out of sight. We saw it. And when we came up, careful, we spotted three guys hiding out behind the rocks yonder. They look to me like they're waiting for somebody to go strolling back from the shoreline so's maybe folks out at the powerhouse can't see 'em. That'd be you and her. Huh?"
Joe went cold. Not for himself. For Sally. "There's nobody else around," said the Chief, "Who'd they be waiting for but you two? Major Holt would be upset plenty. Security might get shook up. There might be breaks for guys who wanted to do a little extra sabotage, besides maybe hindering fixing the gyros. Then they could try for Haney and Mike and me."
Joe said coldly, "I've got a pistol, and so has Sally. Shall we take those pistols and go ask these three if they want to start something?" The Chief snorted.
"Use sense! It's good you've got the pistols, though. I snagged a .22 rifle from a shooting gallery. It was all I could get in a hurry. But go hunting trouble? Fella, I want to see that Platform go up! I'll take care of things now. Good layout here. They got to come across the open to get near. Don't say anything to Sally. But we'll keep our eyes open."
Joe nodded. He carried the chilled, dripping bottles back to where Haney solemnly ate a sandwich, sitting crosslegged with his back to the lake and regarding the shore. The Chief dragged a .22 repeating rifle from inside his belt, where it had hung unnoticed alongside his thigh. He came strolling casually after Joe. He dropped the rifle beside Mike.
"You said you felt like target practise," he said blandly. "Here's your armament. Any more sandwiches, ma'am?"
Sally smilingly passed him the last one. She left the top of the basket open. The pistol that had been there was gone. Then Sally's eyes met Joe's, and he knew she knew that his friends hadn't come so far merely to crash 'a picnic. But she took it in stride. It was an additional reason to approve of her.
"Me," said the Chief largely, "I'm goin' to swim. I haven't had more water around me than a shower bath for so long that I crave to soak and splash. I'll go yonder and dunk myself.'"
He wandered off, taking bites from the sandwich as he went. He vanished. Haney leaned back against a sapling, his eyes roving about the shoreline and the rocks and brush behind it.
Mike was talking in his crackling small voice, "But just the same it's crazy! Fighting sabotage when us little guys could take over in a week and make sabotage just plain foolish! We could do the whole job while the saboteurs weren't looking!"
"Have you got the figures?" Sally said interestedly. "Were they ever passed on?"
"I spent a month's pay once," said Mike sardonically, "hiring a math shark to go over them. He found no mistake. We'd more margin than I'd figured!"
"Joe! Listen to this!" Sally said. "Mike says he has the
real answer to sabotage and the Space Platform's purpose!"
Joe dropped to the ground and said, "Shoot it." He was grimly alert. There were men wailing for them to leave the shoreline. Since the others had come, now they'd be waiting for them to start back for their cars. The waiting men were armed, and they'd intended to murder Sally and himself. Since the Chief and Haney and Mike had arrived, they'd be killed too. Because to kill them would hinder the Platform. And because in the tumult their murder would cause, there might be chances for more destruction.
It occurred to Joe that from a saboteur's standpoint it would be most effective to leave his—Joe's body to be found, while Sally simply vanished. That would cause a much more desperate search than even her known murder. Men would leave the work on the Platform to hunt for her, and security men would be detached.
Joe's jaws clamped tautly shut at the ideas that came into his mind.

But Mike took the floor.
"Forget about the Platform for a minute," he said authoritatively. He stood up to gesticulate, being forty two inches high. "Just figure on a rocket shot straight to the moon. You got to have a payload ratio of one to a hundred and twenty—a hundred and twenty tons of fuel to one ton of payload. Okay! You're gonna land a man there. He weighs two hundred pounds. He uses twenty pounds of food and drink and oxygen a day. Give him grub and air for two months; twelve hundred pounds. A cabin seven feet high and ten feet across. Sixteen hundred pounds, with insulation an' braces for strength. You can get him there, and he'll live two months, and then he'll die for lack of air."
Sally nodded. "I've seen figures like that," she agreed. "But take a guy like me!" said Mike bitterly. "I weigh forty five pounds, not two hundred. I use four pounds of food and air a day. A cabin for me to live in would be five feet high and six across. Being smaller, it wouldn't need as much bracing. Maybe more insulation, but a cabin for me would weigh two hundred pounds. Me, on the
moon supplied for two months would mean a payload oi five-fifty pounds! It'd need a smaller rocket to carry it. You could put me on the moon with a fifty-ton rocket!"
"I—see," said Sally.
He looked at her suspiciously, but there was no mockery in her expression.
"It'd take a twelve-hundred-ton rocket to get a full-sized man to the moon in a direct shoot," he said with sudden flippancy, "but a guy my size could do the same job of stranglin' in a fifty-ton job. Counting how much easier it'd be to get back—I could make a round trip— direct rocket! I could get there, land, take specimens, and start back against the moon's gravity in a eighty-ton rocket against—against—you know what a roundtrip di-rectshot job would be! With the Platform up, and a refuelling job, you'll be able to colonize the moon, all right. But using guys like me you could do it a hundred times easier and a hundred times quicker, and it's a hell of a note that nobody'U try it!"
Then he said coldly, "Haney, sitting like you are, you're a sitting duck!"
The comment was just. Joe knew that Sally was on the lakeward side of this semiisland, and there were bulletproof rocks between her and the mainland. But Haney sat crosslegged so he could watch the shore, and he hadn't moved in a long while. If somone did intend to commit murder from a distance, Haney was offering a chance for very fine aim. He moved.
"Yeah!" said Mike with a fine irony, returning to his topic. "I can show you the figures! There are plenty other guys like me. We've got as much brains as fullsized people. If the big brass had figured on us small guys, they coulda made the Platform the size of a one family house and it'd ha' been up in the sky now, with guys like me runnin' it, and guys my size could run the ferry rockets takin' fuel up for storage, and four of us could take a six-hundred-ton rocket and slide out to Mars and be back by spring-time—next springtime—with all the facts and the photographs to prove 'em. By Golly."
Then he made a helpless gesture. "But that's just the
big picture," he said bitterly. "Think of right now! They're building ferry-rockets now!"
"I know." Sally said apologetically. "They'll carry up fuel and supplies and reliefs for the Platform's crew."
"Put four of us small guys in a ferry-rocket," said Mike sardonically. "We'd have grub and air for months! Put in a hydroponic garden and communicators and we'd be a Platform right away! Send up another ferry to join us, and we'd have missiles. Send up three ferry-rockets with us as crews, and we could join 'em and have a Platform in orbit and working—and what'd be the use of sabotaging the big Platform then? There'd be no use in it, because we could do everything the big one's wanted to do! But," he demanded bitterly, "do you think anybody'll do anything as sensible as that?"
His small features were twisted in angry rebellion. He was quite right in all his reasoning. Mankind could have made the journey to the other planets in a hurry, and the Space Platform could have been in the sky much more quickly, if only men would have consented to be represented by people like Mike—who would have represented them very valiantly.
But people wouldn't do it, and Mike was eating his heart out.
Sally said distressedly, "Oh, Mike! It's all true and I'm so sorry!"

And she meant it. Joe liked Sally especially much just then. She didn't patronize Mike, or try to reason him out of his heartbreak, but felt honest sympathy.
Then Haney said abruptly, "Somebody's spotted the Chief."
Joe mentally kicked himself. The Chief had said he was going to swim. Now—but only now—Joe looked to see what he was doing.
He was far out from shore, swimming unhurriedly. He was threequarters of the way to the powerhouse in the middle of the dam. He would reach that place, and swing up a ladder that could be made out on the damn's upstream side. He would go in the powerhouse and explain the situation. A telephone call to Bootstrap would bring security men at top roadspeed, and parachute troopers a great deal faster. But even earlier the Chief would lead the powerhouse crew ashore, and it would be remarkable if they didn't have at least shotguns for the shooting of waterfowl in and out of season.
The men in hiding might or might not consider the Chief's swim proof that he'd guessed their intentions. They were probably discussing the matter now. But they couldn't know that the party on the peninsula was armed.
Nothing happened for minutes. The Chief hadn't reached the powerhouse. Haney changed his position again.
Mike said brittley, "We're going to have visitors."
He lay down carefully on the ground, some fifteen feet uphill from Sally. He could look over the ridge. He snuggled the .22 rifle professionally close to his shoulder. He drew a bead.
Three men very casually strolled out of the brushwood on the shore. They moved negligently toward the strand of rocks leading out to the picnic spot. They looked like anybody else from Bootstrap. Ordinary, rough, working-clothes ... Haney bent down and picked up some good throwing stones. His expression was pained.
Joe said, "We've got pistols, Haney, and Sally's a good shot."
The men came on. Their manner was elaborately ordinary. Joe stood up into view.
"No visitors," he called. "We don't want company!"
One of the men held his hand to his ear, as if he couldn't hear clearly. They came on, with no threatening gestures at all.
Then Joe took his hand out of his pocket. The pistol Sally had given him was in it.
"I mean that!" he said harshly. "Stand back!"
One of the three spoke sharply. On the instant the three rushed. Pistols appeared. They roared as the men hurtled forward. The purpose was not so much murder at this instant as the moral effect of flying bullets to make murder easier as they came close.
A stone went whizzing by Joe—Haney had thrown it —and the small target rifle in Mike's hands made a coughing noise. Joe held his fire. He had only six bullets and three targets to hit. With a familiar revolver he'd have started shooting now, but thirty yards is a good range with a strange pistol at a moving target.
One of the three attackers stumbled and crashed to the ground. A second seemed suddenly to be grinning widely on one side of his face. A .22 bullet had slashed his cheek. The third ran headon into a rock thrown by Haney, and it knocked the breath out of him and his pistol fell out of his hand. Joe fired deliberately at the widely grinning man and he spun around. Mike's target rifle spat again—Joe remembered that he'd heard it spit more than once before—and then the man Joe had hit wheeled about and ran heavily away, making incoherent noises. The one who'd stumbled scrambled to bis feet and fled, hopping crazily and favoring one leg. The doubled-over man, deserted, turned and ran too, still doubled over and still gasping.
Mike was saying things that crackled, in his midget's voice. He was in a towering rage because of the way the target rifle shot. It threw high and to the right. The shooting-gallery paid cigarettes for high scores, so the guns didn't shoot straight. Mike sputtered hi fury.
Until this moment Joe had been relatively cool. Cool enough, anyhow, because he had something to do. But just then he heard Sally say, "Oh!" in a startled voice. He whirled. Unknown to him, she hadn't been waiting under cover, but standing beside <u>him</u> with her pistol ready. Now her face was very white and queer, and she was plucking at her hair. A lock of it came away hi her fingers. A bullet had clipped it just

above her shoulder.
Then Joe felt sick and weak and trembling. He disgraced himself by grabbing her hysterically and demanding crazily if she were hurt anywhere, and raging at her for exposing herself to fire. And as he did this, his knees knocked together and his throat tried to shut off his breath.
Then there came loud pop-pop-popping noises. With the peculiar reverberation of sound over water, two motorcycles started from the powerhouse along the crest of the dam. They streaked for the shore carrying five men altogether, of whom one was the Chief with a red-checked
tablecloth about his middle and brandishing a fireaxe in default of other weapons.
Then, of course, the danger was over. There were three men who had certainly intended to murder Sally and Joe. When Joe's friends arrived, they were included in the plan. But there'd been no reason for the attackers to expect an armed defense, and the defending armament hadn't been impressive. One of the assailants had been knocked out of action by a rock thrown by Haney. Another's leg was punctured and his cheek laid open by .22 bullets fired by Mike. And Joe had hit the third man somewhere with his pistol. The three attackers had fled to the brush, leaving at least one of their weapons behind.
But they couldn't be found immediately and they did have two pistols. Seven men and a girl, with Mike, were safe against them, considering the shotguns from the powerhouse. But they weren't equipped to hunt them down. And now it was near sunset.
So the victors did the sensible thing. They stayed together. Joe and Sally, plus the Chief with his clothes retrieved aad Haney and Mike, headed back for Bootstrap. Two of them rode in the Major's black ear, and the others in the battered vehicle they'd rented for the afternoon. On the way down the canon, they stopped by the car their attackers had driven. They took its distributor and fan belt. They want on. The men from the powerhouse returned to the powerhouse and reported events by telephone. The three men who had planned murder became fugitives, with no means of transportation but their legs. They had a good many thousand square miles of territory to hide in, but it wasn't likely that they had food or any way of finding it in the wilds. Two of them were certainly hurt. With dogs and planes and organization it should be easy to catch them in the morning.
So Joe and Sally drove back to Bootstrap with the other car following closely. Halfway back, they met the cars full of men who would begin their manhunt in the morning. After that, Joe felt better. But his teeth still tended to chatter every time he thought of Sally pulling away a lock of her hair that had been cut off by a bullet.
When they made their report to Major Holt, he sud-
denly looked very old. Sally explained breathlessly that her danger was her own fault. Joe had told her to keep down, and she hadn't.
"It was my mistake," said the Major detachedly," to let you go away from the Shed at all. I do not blame Joe."
But he did not look kindly. Joe wet his lips. He was ready to believe that any disgrace he could be in was justified, since it had caused Sally to be shot at.
"I blame myself, sir," he said grimly. "But I promise I'll never take Sally anywhere again until the Platform's up and there are no more professional saboteurs around."
"I have to arrange for more than that." The Major said remotely. "I shall put you in touch with your father, by telephone. You will explain to him, in detail, exactly how the repair of the gyros is planned. I understand it can be duplicated more quickly, now, by the method you've worked out?"
"Yes, sir," said Joe. "The balancing was the tough part, and we think that's whipped. But anything can be done more quickly the second time."
"You will explain that to your father," said the Major. "The plant will begin to duplicate the pilot gyros at once. Meanwhile your workcrew will get at the one that's here."
"Yes, sir."
"And," said the Major, "I am sending you to the push-pot airfield. I intend to scatter the targets the saboteurs might aim at. You are one of them. Your workmen are another. From time to time you will confer with them and verify their work. If any of them should be—disposed of, you will be able to instruct others." .

"It's really the other way about, sir," protested Joe. "The Chief and Haney are pretty good, and Mike has brains."
The Major moved impatiently.
"I'm looking at this from a security viewpoint," he said. "Arranged this way, it would take four separate successful murders to prevent the gyros' repair or duplication. They might try one or two, but four might not be practical. I think they'll look for another weak **spot to** attack."
Joe didn't like the idea of being moved away. He wanted to work on the job that he felt was his responsibility. Besides, he had a feeling about Sally. If she were in danger he wanted to be there.
"About Sally, sir—"
"Sally," said the Major tiredly, "is going to have to restrict herself until she feels jail would be preferable. But she will see the need for it. She'll be guarded rather more carefully than before—and you may not realize *it,* but she has been guarded rather well."
Joe saw Sally smiling ruefully at him. It was unpleasant, but the Major was right. It was necessary. The difference between things that get done and those that don't is often only that somebody doggedly did the needed things that looked unimportant and sacrificed the things that prom- 1 ised pleasure. Joe wouldn't see Sally very often. The Chief and Mike and Haney would do the actual work Joe wanted to have a hand in. These deprivations shouldn't be necessary. But they were.
"Very well, sir," said Joe gloomily. "When do I go over to the field?"
"Right away," said the Major. "Tonight." Then he added; "The official excuse for sending you there is that you have been useful in uncovering sabotage tricks. You have. But it isn't that I want you there. It's that I want you away from here!"
The Major nodded dismissal with an indefinable air of irony, and Joe went unhappily out of his office. He telephoned his'father at length. His father did not share Joe's annoyance at being removed to a place of safety. He undertook to begin a spare set of pilot gyros at once.
A little later Sally came out of her father's office.
"I'm sorry, Joe!"
He grinned unhappily. "So am I. I don't feel good about it, but to get the Platform up—I suppose I can phone you?"
"You can," said Sally. "And you'd better!"
They'd talked a long time that afternoon, very satisfy-ingly and without any cares at all. Neither could have remembered much of what had been said. It probably was not earthshaking in importance. But now it seemed neces-
sary to have more such conversation, even if only by telephone.
"I'll call you," said Joe.
Then somebody approached him to take him to the pushpot airfield. Joe and Sally separated very formally under the eyes of a security officer.
Then there was a very tedious journey through the darkness. This particular security officer was not companionable. He was probably one of those conscientious people who think that if they keep their mouths shut so no valuable information escapes them, it will make up for their inability to keep their eyes open. He treated Joe as if he were a highly suspicious person. It was very likely that he treated everybody that way.
Joe went to sleep in the car.
He was barely awake when he arrived, and he didn't bother to rouse himself particularly when he was shown to a cubbyhole in the officers' barracks. He went to bed, making a half-conscious note to buy himself clothes— especially fresh linen—in the morning. He thought of that as he climbed under the covers.
Then he knew nothing until he was awakened by what sounded exactly like the crack of doom, taking place just outside his window in the early morning.

9

IT WAS not, however, the crack of doom. When Joe stared out the window beside his bed, he saw gray

dawn breaking over the landing-field he hadn't seen at all the night before. There were low, featureless structures silhouetted against the sunrise. As the light grew brighter, he made out that the angular shapes were hangers. He saw rather improbable cranepoles looming above them. One was *in* motion, handling something he could not make out. The noise that had awakened him was less, now. It seemed to circle overhead, and it had an angry buzzing quality that was not natural to any sort of motor lie'd ever heard before.

He shivered, standing at the window. It was cold and uncomfortable in the dawnlight at this altitude, though it would be warm enough later on. But he wanted to know what that completely unbelievable racket had been. A craneboom by the hangers tilted down, slowly, and then lifted as if released of a great weight. The light grew slowly brighter. Joe saw something on the ground. Rather, it was not quite on the ground. It rested on something.

There were indeterminate small noises. Then that unholy uproar began again. Something moved. It ran heav- I ily out from the masking dark outlines of the hangers, t It picked up speed. It acquired a reasonable velocity, 1 forty or fifty miles an hour, perhaps. As it scuttled over f the dimly lighted field, it made a din like all the boiler factories hi the world and all the backfiring motors in creation trying to drown each other's noises out. j

It was a pushpot. Joe recognized it with incredulity. ;i It was one of those utterly ungainly creations that were ; built around onehalf of the inner wall of the Shed. In shape the upper part was rather like the top half of a loaf of bread. In motion, here, it rested on some sort of wheeled vehicle, and it was reared up like an indignant caterpillar, and a blue-white flame squirted out of its tail, with coy and frolicsome flirtings from side to side.

It lifted from the vehicle on which it rode, and the vehicle put on speed and got away from under it with a frantic agility. The vehicle swerved to one side and Joe lost sight of it. He stared with all his eyes at the pushpot, some twenty feet aloft. It had a flat underside, and a topside which still looked to him like the rounded top half of a loaf of baker's bread. It hung in the air at an angle of about forty five degrees, and it howled like a panic-stricken dragon—Joe was getting his metaphors mixed by this time—and it swung and wabbled and slowly gained altitude, and then suddenly it seemed to get the knack of what it was doing. It abruptly began to climb skyward.

Until it shot upward it looked heavy and clumsy and wholly unimpressive. But when it climbed it really moved!

Joe stuck his head out the window, craning up to look at it. Its unearthly din took on the indignant quality of an irritated beehive. But it climbed! It went up, without grace but with astonishing speed. And it was large, but it became lost in the dawn flecked sky while Joe still gaped at it.

He pulled in his head and flung his clothes on. He went out his room door into resonant empty corridors, hunting for somebody to tell him something. He blundered into a messhall. There were many tables, but the chairs around them had been pushed back by people in a hurry to be somewhere else. There were exactly two people visible, over in the corner.

Another din like the wailing of a baby volcano. It began, and moved, and went through the series of changes that ended hi a climbing, droning hum. Another. The launching of pushpots for their morning flights was evidently getting under way.

Joe hesitated, hi the empty messhall. Then he recognized the two seated figures. They were the pilot and copilot, respectively, of the plane that had brought him to Bootstrap and crashed on landing.

He went over to their table. The pilot nodded matter-of-factly. The co-pilot grinned. Both were still bandaged for burns, which might account for their remaining here. But they might be held over for the inquiry into the crash.

"Fancy seeing you here!" said the co-pilot cheerfully. "Welcome to the Hotel de Gink! But don't tell me you're going to fly a pushpot!"

"I hadn't figured on it," said Joe.

"I tried it once, for the devil of it," said the co-pilot amiably. "Those things fly with the grace of a lady elephant on rollerskates! Did you notice they haven't any wings? And did you notice where their control surfaces are?"

Joe shook his head. He saw the remnants of ham and eggs and coffee. He was hungry. Another pushpot took off.
"How do I get breakfast?" he asked.
The co-pilot pointed to a chair. He rapped sharply on a drinking glass. A door opened somewhere, he pointed to Joe, and the door closed.
"Breakfast coming up," said the co-pilot. "Look! I know you're Joe Kenmore. I'm Brick Talley and this is Captain—no less than Captain—Thomas J. Walton. Are you impressed?"
"Very much," said Joe. He sat down. "What about the control surfaces on pushpots?"
"They're in the jet blast!" said the co-pilot, now identified as Talley. "Like the V2 rockets when the Germans made them. Vanes in the exhaust-blast, no kidding! Landing and skidding in on their tails like they do, they haven't speed to give wingflaps a grip on the air, even if they had winds to put wingflaps on. Those dinkusses are things to have bad dreams about!"
Remarkably, a door opened somewhere and a man in uniform with an apron in front came marching in with a tray. There was tomato juice and ham and eggs and coffee. He served Joe briskly and went out again.
"That's Hotel de Gink service," said Talley. "No wasted motion, no sloppy civilities. He was about to eat that stuff, but he gave it to you and now he'll cook himself a double portion of everything. What're you doing here, anyhow?"
Joe shrugged. It occurred to him that it would neither be wise nor credible to say that he'd been sent here to split up a target at which saboteurs might shoot.
"I guess, I'm just attached for rations," he observed. "There'll be orders about me eventually. Then I'll know what it's about."
He fell to on the breakfast. The thunderous noises of pushpots taking off made the messhall quiver. Presently he said between mouthfuls, "Funny way for anything to take off, riding on—it looked like a truck."
"It is a truck," said Talley. "A highspeed truck. Fifty of them especially made to serve as undercarriages so pushpot pilots can practise. The pushpots are only really expected to work once, you know."
Joe nodded.
"They aren't to take off," Talley explained. "Not in theory. They hang on to the Platform and heave. They go up with it, pushing. When they get it as high as they can, they'll shoot their jatos, let go, and come bumbling home. They'll do the work of a firststage booster that can't be applied to the Platform. But the pilots have to practise getting home and landing. For training, it doesn't matter how they get aloft. When they get down, a big straddletruck on caterpillar treads picks them up and brings 'em home. Then a crane heaves them up on a highspeed truck and they do it all over again."
Joe considered while he ate. It made sense. The function of the pushpots, as such, was that of the first stage of a multiple stage rocket. All together, they'd get the Platform off the ground and out of the Shed and take it as high as their jetmotors could take it. They'd simultaneously be travelling eastward at the highest speed they could manage. Then they're fire their jatos simultaneously, and in so doing they'd be acting as the second booster stage of a multiple stage rocket. Then their work would be done, and their only remaining function would be to get their pilots back to the ground alive, while the Platform as its own third stage went on out to space.
"A pushpot pilot's life is not a merry one," said Talley. "When he's made ten landings, and survived them, he's an expert. Then he only does others occasionally, so he won't forget. Those characters sweat!"
The pilot grunted. Talley spread out his hands.
"Every so often one comes down as it shouldn't. Something happens to the motors. Maybe they've got too much power. Sometimes—occasionally—they explode."
"Jetmotors?" asked Joe. "Explode? That's news!"
"A strictly special feature of pushpots," said Talley. "They run them and run them and run them, on test. Nothing ever happens. But sometimes one blows up hi flight. Once it happened warming up. So I'm told."
"It doesn't sound reasonable," said Joe slowly.
"It's also inconvenient," said Talley. "For the pilots."

Walton opened his mouth.
"Four pilots in two weeks," he said curtly. "If it could be done, it would be sabotage." He lapsed into silence again.
Joe considered. He frowned.
A pushpot, .outside the building, hysterically bellowed its way across somewhere and its noise changed. It went aloft. It went spiralling up and up, Joe stirred his coffee.
There were thin shoutings outside. Then a screaming, whistling noise. Then a crash. It sounded like a heavy bomb going off. Metallic things shrieked and died. Then silence. Talley looked sick.
"Correction. Five pilots in two weeks. It's getting serious." He looked sharply at Joe. "Better drink your coffee before you go out to look. You won't want it afterwards."
He was right.
Joe saw the crashed pushpot half an hour later. He found that his ostensible assignment to the airfield for examination of sabotage was taken at its face value. A young lieutenant solemnly escorted him to the spot where the pushpot had fallen, only ten feet from a hangarwall. The impact made a hole five feet deep. There'd been a fire, now put out.
The ungainly flying thing was destroyed. There were ' entrails of steel tubing piercing its skin. The plastic cockpit cover was shattered. There were grisly stains where the pilot had been.
The motor had exploded. The jetmotor. And jetmotors do not explode. But this one had. It had burst from within, and the turbine vanes of its compressor section were revealed, twisted like straw by the detonation. The jagged edges of the tear testified to the violence of the internal explosion.
Joe looked wise and felt nauseated. The young lieutenant politely looked away when Joe's face showed how he felt. Joe even felt guilty that he was shown these things instead of somebody better qualified in methods of destruction.
Yet, in a sense, that very fact was an advantage. A man may be set to work to contrive methods of sabotage. Another man is trained to counter his efforts. The training of the second man is essentially a study of how the first man's mind works, so it can be guessed what he will think and do. But such a man will be badly handicapped *ft* he tries to understand the sabotage methods of a third
man who thinks in a new fashion. He may be hampered hi studying a new way of thinking because he knows so much about the first.
Joe went off and scowled at a wall, while the young lieutenant waited hopefully nearby. There was something that tried to work itself out in his brain, and he didn't know how to help it. There was some similarity between the boobytrapping of the transport ship, two days before, and the way these pushpots tested out as perfect, and presently blew up. The attack on the transport by a rocketfiring other plane was not similar. But the parcel that blew up when thrown from the plane before its attempted bellylanding, and the substitution of explosive gas for the CO2 intended to be a fire-extinguisher ... They had the same feeling. What was it?
He scowled. The intended dusting of the Shed with radioactive cobalt didn't fit. Boobytrapping a truck that had been in an accident did share the equality of the others. Actually, of course, there were different sabotage organizations at work, with distinctive methods. But Joe had the enraging feeling that somewhere in his mind there was a definite clue, and he couldn't think of it.
The young lieutenant waited respectfully for him to have an inspiration. Had Joe known it, his manner impressed the lieutenant. But Major Holt hadn't actually meant for Joe to try to solve a series of disasters blamed on defects in the pushpot motor's design. When Joe gave up for the moment, the lieutenant eagerly showed him all over the field, and all its workings.
In midmorning another pushpot fell screaming from the skies. That meant six pushpots and their pilots in two weeks. Two today. The things had no wings. They had no gliding angle. Pointed up, they could climb unbelievably. While their engines functioned, they could be controlled after a fashion. But they were not aircraft hi any ordinary meaning of the word. They were engines with fueltanks and with controls in their exhaust blast. When their engines failed, they were so much junk falling out of the sky.
Joe happened to see the second crash, and he didn't go
to noon mess at all. He hadn't any appetite. Instead, he

" gloomily let himself be packed full of irrelevant information by the lieutenant, who was vastly respectful of anybody approved by high authority.

All the while Joe followed him about, his mind fumbled with a conviction that somewhere in the sabotage he happened to know about, there was a pattern. Not all of it fitted together, but if a coherent pattern could be found, the saboteur could be outguessed because he wouldn't realize his own pattern of ideas. One saboteur's kind of thinking. One group's way of thinking. One—

Take Braun. Braun had been an honest man blackmailed into agreement to do sabotage—multiple murder—to commit a massacre. He was to have released finely divided radioactive cobalt in the Shed where it didn't belong. He was to have been the means by which something extraneous and deadly was to have been introduced.

That was it! There were different ways of destroying things. One way would be to make them destroy themselves. But that wasn't the process here. This kind of sabotage tried to put destruction where destruction didn't belong. Grenades in wheel-wells. Explosives in cases marked *"Stationery."* Radioactive cobalt dust. The minds that planned these tricks said, in effect, "These things will destroy. How can we get them to where they can destroy something?" It was a strict pattern.

But was that pattern followed in the pushpot sabotage?

Making motors explode ... Motors don't explode. One couldn't put bombs into them. There wasn't room. The two exploded motors he'd seen looked as if the blasts centered in the fire-basket—technically the combustion area, behind the compressor and before the drive-vanes. A jetmotor whirled. Its commpressor-turbine sucked in air from ahead and delivered it under high pressure to the combustion-chamber. There a flame burned furiously and the air swelled and poured out past other vanes that took power from it to drive the compressor. The excess of blast poured out astern to drive the ship.

But one couldn't put a bomb in a fire-basket because the temperature there would set it off or destroy it, before a pushpot left its truck launching-vehicle. It wouldn't wait. Yet something had been put there!

In the afternoon Joe watched landings while the young lieutenant followed him patiently about. A pushpot landing was quite unlike the landing of any airborne thing. They came flying down with incredible clumsiness, making an uproar out of all proportion to their landing speed. They came in with their tails low, crudely and cruelly clumsy in their handling. They had no wings or fins. They had to be balanced by their jetblasts. They had to be steered the same way. When a jetmotor conked out there was no control left. The pushpot fell.

He watched them land. They came down low, and swung in toward the field, and seemed to reach their sterns down tentatively to slide on the earth, and the flames of their exhausts seared the field, and they hesitated, pointing up at ever steeper angles. Then they touched and their noses tilted forward, and they leaped up as their jets roared more loudly, and they touched again.

The idea was for them to make contact with the ground with the whole of the pushpot's weight supported by the vertical thrust of the jet and while it was moving forward at the lowest possible rate of speed. When that ideal was achieved, they flopped solidly flat, slid a few feet on their metal bellies, and lay still. Some hit hard and tried to dig into the earth with their blunt noses. Joe saw one turn a complete forward somersault. One touched with no forward speed at all, and it rolled over backward with its belly in the air. The last of them touched down and flopped, and the memory of the wreckage had been overlaid by other sights and Joe could think of the evening meal without aversion. When it was dinnertime he went doggedly back to the messhall. There was a sort of itchy feeling in his mind. Somewhere there was an approach to this problem of the pushpots. He knew he had it, but he didn't know what it was.

Talley and Walton were again at table when he went in. He joined them. Tally looked at him inquiringly.

"Yes," said Joe gloomily." I saw both crashes and I didn't want any lunch. It was sabotage. Only it was—somehow it was different. I can't figure out what it is!"

"Tricky, eh?" said Talley amiably. "You'd learn something from oldtime Resistance fighters abroad. The Poles really had some tricks! They had one guy who could get at the tankcars that took aviation gasoline from the refinery to the various airfields the Nazis had. He used to dump some compound or other into each carload of gas. It looked all right, smelled all right, and worked all right. But at odd moments Nazi planes would crash. The valves would stick and the

engines conk out."
Joe stared at him. It was as simple as that. He saw. "The Nazis lost a lot of planes that way," said Talley. "Those that didn't crash from stuck valves in flight, had to have regrinding jobs. Lost flying time. And when the Nazis did uncover the trick, they had to re-refine every drop of aviation gas they had!" "That's it!" Joe said. "That's it? What's it?"
"It's the trick of loading CO2 bottles with explosive gas, too! Excuse me!"
Joe got up from the table and hurried out. He found a phonebooth and got the Shed, and then the security office, and at long last Major Holt. The Major's tone was curt. "Yes? Joe?... The three men from the affair at the lake were tracked down this morning. When they were cornered "they tried to fight. No information to be had from them, if that's what you wanted to know."
The Major's manner seemed to disapprove of Joe as expressing curiosity. His words meant, of course, that the three would-be murders had been killed.
Joe said carefully. "That wasn't what I called about, sir. I think I've found out something about the pushpots. How they're made to crash. But it needs to be checked." The Major said briefly, "Tell me." Joe explained, "All the tricks but one, sir, that were used on the plane I came on, were one kind of trick. They were all arrangements for getting things like bombs and such where they didn't belong. The saboteurs were adding destructive items to the things they wanted to smash. They never substituted something destructive. You see?" "Go on," said the Major on the telephone. "But putting explosive gas in the CO2 bottles," said Joe, painstakingly, "wasn't adding something. It was sub-
stituting something. They changed what a plane normally has, instead of putting something abnormal like a bomb where it didn't belong."
The Major, to do him justice, had the gift of listening. He waited.
"The pushpots," said Joe very carefully, "naturally have their fuel stored in different tanks, just like ordinary planes. The pilots switch from one tank to another, as plane pilots do. In the storage and fuelling pits, where all the fuel for the pushpots is kept in bulk underground, there are different tanks too. At the fuelpump, sir, the attendant can draw from any of those underground tanks he pleases."
The Major said curtly; "Obviously! What of it?"
"CO2 bottles, sir, had another gas substituted. Suppose, as a pushpot is fuelled and the fuel goes into its different tanks—suppose one tank in one pushpot is filled from a special underground tank? All the other tanks will contain normal fuel. The pushpot will fly until the pilot switches to that one tank of doctored fuel. Then it will blow."
Major Holt was silent.
"You see, sir?" asked Joe. "The pushpots could be fuelled a hundred times in a perfectly regular way, and then turning a spigot when one tank was being filled in one pushpot would make all the difference. When that pushpot began to use that one tank of stuff... There'd be no pattern in the explosions."
"Of course I see!" Major Holt said coldly. "There'd need only to be one tank of doctored fuel to be delivered to the airfield, and it need not be used for weeks. And there'd be no trace in any wreckage, because of the fire. You're telling me that there is one underground storage tank where the fuel is highly explosive. It is plausible. I'll have it checked immediately."
He hung up and Joe went back to his meal. He felt uneasy. There couldn't be any way to make a jetmotor explode unless you fed it explosive fuel. Then there'd be no way to be sure after the wreck had burned. But the feeling of having reported a guess, only, was not satisfying. Joe ate gloomily. He didn't pay much attention to Talley.
He had that dogged, uncomforable feeling a man does have when he knows he doesn't qualify as an expert, but feels that he's hit on something the experts have missed.
Half an hour after evening mess—near sunset—a man wearing a security uniform, hunted up Joe at the airfield. "Major Holt sent me over to bring you back to the Shed," he said politely.
"If you don't mind," said Joe with equal politeness, "I'll cheek that."
He went back to the phonebooth. He found out that nobody had been sent to get him.
So he stayed in the phonebooth, on orders, while the Major did some fast telephoning. It was comforting to 1 know that he had a pistol in his pocket, and it was frustrating not to be allowed to try to capture the

fake security officer himself. Evidently, the idea of murdering him had not been abandoned. He'd have liked to take part personally in protecting himself. But it was most important for the fake security man to be captured.

Actually, of course, the fake officer had started his get-away instantly Joe went to check on his orders. It hadn't been practical for him to try to shoot Joe down where he was. There were too many people around. But he didn't get away, at that. Some twenty minutes later, while Joe still waited fretfully in the phonebooth, the instrument rang and Major Holt was again on the wire. And this time Joe was instructed to come back to the Shed. He had exact orders who to come with, and they had orders which identified them to Joe.

Some eight miles from the airfield, they came upon a wrecked car with motorcycle security guards working on it. They stopped Joe's escort. Joe's phonecall had set off an alarm. A plane had spotted this car tearing away from the airfield, and motorcyclists were guided after it by the plane. When it wouldn't stop and the fake security man tried to shoot his way clear, the plane strafed him. So he was dead and his car was a wreck. The motorcycle men were trying to get some useful information from his body and the car.

Joe went to the Major's house in the officers' quarters area. The Major looked a good deal more tired than before, but he nodded approvingly at Joe. Sally was there too, and her approval and relief was even more marked.

"You did very well," said the Major detachedly. "I haven't too high an opinion of the brains of anybody your age, Joe. When you are my age, you won't have, either. But whether it's brains or luck, you're turning out to be useful."

Joe said, "I'm getting security conscious, sir, I suppose. I want to stay alive."

The Major regarded him with some irony.

"I was thinking that when you worked out the idea of the doctored fueltank, you didn't try to be a hero and prove it yourself. You referred it to me. That was a remarkably sane procedure. Otherwise you might have been killed and your suspicions might not ever have reached me. They were correct. One storage tank underground was half full of doctored fuel. Rather more important, another was full and not yet drawn on."

The Major paused, and said without especial cordiality, "It appears that this particular trick was being tested out. It is likely that it would have been stopped until the push-pots were fuelled for the Platform's launching. If so, it could have happened that on the Platform's takeoff most or all of the pushpots would have been arranged to explode after the Platform was aloft, but before it could possibly have gotten out to space."

Joe felt queer. The Major was telling him, in effect, that he might have kept the Platform from crashing on the way up. It was a good but alarming suggestion. It was still the most important thing of all, to Joe, that the Platform get out to space. It was much more important than that he be credited with saving it. And it wasn't reassuring to hear that it might have been wrecked.

"I called you back from the airfield," the Major told him without warmth, "to say that you've done a good job, so far. It seems to deserve some recognition."

"I'm doing all right, sir," said Joe, awkwardly.

The Major nodded impatiently.

"Yes. But one of the men selected and trained for the crew of the Platform has been taken ill. In strict confidence, sabotage has become so dangerous that it's been decided to get the Platform aloft as soon as humanly possible, even if some parts of its equipment aren't completed. So—ah—in view of your usefulness, I said to Washington that the greatest reward you could be offered was—ah—to be trained as an alternate crew member, to take this man's place if he does not recover in time." The room seemed to reel around Joe. Then he gulped. "Yes, sir! I mean—that's right. I mean I'd rather that than anything else in the world."

"You'll stay here, take instructions, and be guarded a good deal more closely than before. But you understand that you're still only an alternate! The odds are definitely against your going!"

"That's—that's all right, sir," said Joe unsteadily. "That's quite all right!"

The Major went out. Joe stood still, trying to realize what all this might mean to him. Then Sally stirred. "You might say thanks, Joe!" Her eyes were shining, and she looked proud, too. "I put it hi Dad's mind that that was what you'd like better than anything else," she told him. "If I can't go up in the Platform myself—and I can't—I wanted you to go. Because I knew you wanted to."

She smiled at him gravely as he tried incoherently to talk. With a sort of maternal patience, she led him out on the porch of her father's house and sat there and listened to him. It was a long time before he realized that she was humoring him. Then he stopped and looked at her suspiciously. He realized that in his enthusiastic gesticulations he had been making gestures with her hand as well as his own.

"I guess I'm pretty crazy," he said wryly. "Shooting off my mouth about myself up there in space. You're pretty decent to stand the way I am, Sally."

He paused. Then he said humbly, "I'm plain lucky. But knowing you and having you like me reasonably much is pretty lucky, too!"

She looked at him noncommittally. He added painfully. "And not only because you spoke to your father and told him just the right thing. You're—sort of swell, Sally!" She let out her breath. Then she grinned at him.

"That's the difference between us, Joe," she told him. "To me, what you just said is the most important thing anybody's said tonight."

10

THE WORLD turned over on its axis with unfailing regularity, and nights followed mornings and mornings followed night according to well established precedent. Above the thin film of the Earth's atmosphere very many small objects went hurtling in divers directions. Some held out silvery paddles toward the sun, and some aimed bristling radio antennae at various angles, and some did nothing in particular that could be noticed. From many of them, though, invisible microwaves went down to Earth, giving information about cosmic rays, and solar storms, and terrestrial magnetism, and a large number of stray subjects. They used various languages for their transmissions. One sounded much like a blank phonograph record played after somebody had walked on it with hobnailed boots. Another was composed of hoots, howls, clicks, whistles, and moaning sounds, conscientiously radioed to Earth below. These two languages—and others—were piously received by telemetering reception equipment and electronically translated into scientific information. And men talked proudly of the conquest of space.

But in the Shed and in Bootstrap they tried to bring it about.

Work resumed in the Shed. Only one man in Bootstrap showed up with radiation burns, and he hadn't offered himself for checkover at the hospital. He was found dead in his lodging. Since nobody else seemed to have suffered any burns at all, it was considered that he was the messenger who'd brought the container of radioactive cobalt

to Braun. So the building of the Platform was resutn Busses carried men to the Shed, and took others away, and later carried the first men away and brought other to take their places. Trucks delivered material. Welding torches nickered and flamed. Daily the Platform was a little more nearly complete.

And hi a separate, guarded workshop the Chief and '] Haney and Mike the midget labored mightily to accomplish the preposterous repair of the pilot gyros. Often i Joe helped them. He grew thin because he couldn't take } time for enough sleep, with the alluring prospects of a i possible alternate member of the Platform's crew demanding this much time, and the gyro demanding all the rest.

There were other charges. The assemblyline of push-pots grew shorter, and the remaining clumsy monsters against the sidewall were plainly near to completion. There came a day, indeed, when only five ungainly objects remained in that line, and they were completely plated in and needed only finishing touches. It was at this time that _more crates and parcels arrived from the Kenmore Precision Tool plant, and Joe dropped his schoolroom instructions altogether to assemble the replacement parts with the rotors and bearings on which the four of them worked twice around the clock, at times. They grew groggy from the desperate need both for speed and perfect accuracy, but they got the complex device together, and adjusted it, and surveyed the result through red-rimmed eyes'. They were too weary to rejoice.

Then Joe threw a switch and the reconstituted pilot gyros began to hum quietly, and the humming rose to a

whine, and the whine went deliberately up the scale until it ceased to be audible. Presently a dial announced the impossible and they gazed at a device which seemed to be doing nothing at all. The gyros appeared quite motionless. They spun with such incredible precision that it wasn't possible to detect that they moved at all. And the whole complex device looked very simple and useless.
But the four of them gazed at it, now that it worked, with a sort of passionate satisfaction. Then Joe moved a control, and the axis of the device moved smoothly to a
new place and stayed there. And to another and another and another.
Then the Chief took Joe's place, and under his hand the seemingly static disks, which were actually spinning at forty thousand revolutions per minute, turned obediently and without any seeming of the spectacular. Then Haney worked the controls. And Mike put the device through its paces.
Mike left the gyros spinning so that the main axis pointed at the sun, invisible beyond the Shed's roof. And then all four of them watched. And visibly and inexorably the pilot gyros followed the unseen sun, and they would have resisted with a force of very many tons any attempt to move them aside by so much as one-tenth of a second of arc—which would mean something under one three-millionth of a right angle. And these pilot gyros would control the main gyros with just this precision, and after the Platform was out in space could hold the Platform itself with the steadiness needed for astronomy of an entirely new order of precision.
The pilot gyros, in a word, were ready for installation.
Joe and Haney and the Chief and Mike were not beautiful to look at, by that time. They were begrimed from head to foot, and they were exhausted to the point where they no longer noticed that they were weary. And their mental process were no longer normal except about the gyros, so they were quarrelsome arid arrogant to the men with the flatbed trailer who came almost reverently to move their work. They went jealously with the thing they had built, and they were rude to engineers and construction workers and supervisors, and they shouted angrily at each other as the pilot gyros were hoisted up a shaft left for its passage, and they were far from tactful as they watched with hot, anxious eyes while it was bolted into place. It would be welded immoveably later, but first it was tried out.
And the gyros worked. They visibly and unquestionably worked. They controlled the gigantic wheels which would steer the Platform on its takeoff, and later swing it to receive the cargo rockets coming up from Earth. The pilot instrument ran, and there was no vibration, and in
its steering apparatus the Platform was ready for space.)
Then the Chief yawned, and his eyes glazed as stood in the huge gyroroom. And Haney's knees wobbled,! and he sat down and was instantly asleep. Then Joe vaguely saw somebody—it was Major Holt, as it happened —holding Mike in his arms as if Mike had been a baby. Mike would have resented it furiously if he'd been awake. And then suddenly Joe didn't know what was going on, either.
There was a definite hiatus in his consciousness. He came back to awareness very slowly. He was half-awake j and half-asleep for a long time, during which he only knew contentedly that the job was finished. Then, presently, he realized that he was in a bunk in one of the Platform sleeping cabins, and the inflated contrivance Sally had deviced held him very gently in place. But the pilot gyros were finished and in place. His responsibility to them was ended. And he had slept the clock around very nearly three times. He was starving.
Sally faced him immediately when he went groggily out .of the cabin to look for a place to wash. He was still covered by the grime of past labor, and he had been allowed to sleep with only his shoes removed. He wasn't an attractive sight. But Sally regarded him with an approval her tone belied.
"You can get a shower," she said firmly, "and then I'll have some breakfast for you. Fresh clothes are waiting, too."
Joe said peacefully, "The gyros are finished and they work!"
"Don't I know?" demanded Sally. "Go get washed and come back for breakfast. The Chief and Haney and Mike are already awake. And, because of the four of you, they've been able to advance the Platform's takeoff time to just two days off! It leaked out and now it's official. And you made it possible!"
This was a slight exaggeration, but it was pardonable because of her partiality for Joe. He went groggily into the highly special shower arrangement. In orbit, there would be no gravity, so a bathtub was

unthinkable. The shower cabinet was a cubbyhole with handgrips on all four
sides and straps into which one could slip his feet. When Joe turned handles, needle-sprays sprang at him from all sides, and simultaneously a ventilater fan began to run. That was to draw out a confused mixture of air and water in droplets and larger masses, because in no-gravity a man could drown in his own showerbath. The apparatus for separating the air and water was complex, but Joe didn't think about that at the moment. He observed that however convenient this system might be out in space, on Earth it left something to be desired.

But there were clean clothes wailing when he came out. He dressed and felt brandnew and rested, and it seemed to him very much like the way one feels on a new Spring morning. It was very, very good.

Then he smelled coffee and became ravenous.

The others were in the Platform's kitchen, sitting hi the chairs that had straps on them so one needn't float about because of weightlessness. There was an argument in progress. The Chief grinned at Joe. Mike looked absorbed. Haney was thinking something out rather painfully. Sally was busy at the Platform's very special stove. She had ham and eggs and pancakes ready for Joe to eat.

"Gentlemen," she said, "you are about to eat the first meal ever cooked in a spaceship—and like it!"

She served them and sat down companionably. But her eyes were very special when she looked at Joe.

"Leavin' aside what we were arguin' about," said the Chief blissfully, "Sally here—mind if I call you Sally, ma'm?—says the slide-rule boys have given our job the works and they say it's better than they designed. Take a bow, Joe?"

Sally said, "When the technical journals are through talking about the job you did, you'll all four be famous for precision machining technique and improvements on standard practice."

"Which," said the Chief, "is goin' to make us feel fine when we're back to welding and stuff."

"No more welding," Sally told him. "Not on this job. The Platform's closed in. They've started to take down the scaffolding."

The Chief looked startled.

"Laying off men yet?" Haney asked.

"Not you," Sally assured him. "Definitely not you! You I four have the very top superspecial security rating there | is. I think you're the only four people in the world my father is sure can't be reached to make you harm the Platform."

Mike said abruptly, "Yeah! The Major thought he had headaches before. Now he's really got 'em!"

He hadn't seemed to be listening. He'd acted as if he were feverishly absorbing, the feel of being inside the Platform in the way its crew would be—not as a workman building it but as a man whose proper habitat it would become. But Joe suddenly realized that his comment was exact. There'd been attempts enough at sabotage, to keep the Platform from being finished. But now it was to take off hi two days. If it was to be stopped, it would have to be stopped within fortyeight hours. But there were plenty of people with plenty of resources who needed for it to be stopped. The next two days would contain the last ditch, most desperate and most completely ruthless attempts at destruction that could possibly be made. And Major Holt had to take care of them.

But the four at table—five, with Sally—were peculiarly relaxed. There had been literally thousands of absolutely essential things that'd had to be done before the Platform could hit off, and what they'd done was conspicuous but still only one of thousands. But they had the infinitely restful feeling of a job well done.

"No more welding," said Haney meditatively, "and our job on the gyros finished. What are we gonna do?"

The Chief said firmly, "Me, I'm goin' to sweep floors or something, but I'm sure going to be here and watch this dinkus go up!"

Joe said nothing. He looked at Sally. She became very busy, making sure the others did not want more to eat. After a very long tune Joe said with careful casualness. "Come to think of it, I was getting loaded up with astroga-tion theory and so on, when I had to stop and pitch in with the gyros. How's that sick crewmember, Sally?"

"I—wouldn't know," said Sally unconvincingly. "Have some more coffee?"

Joe made his face completely expressionless. There was nothing else to do. Sally hadn't said that his

chances looked poor for making the crew of the Platform, but she had ways of knowing things. She'd be sure to be kept informed on this matter anyhow, because she was wearing Joe's ring and she'd have wanted to give him any good news there was. But there wasn't any. So the news must be bad.
Joe drank his coffee, trying to make himself believe that he'd known he wouldn't make the crew. He'd started late to learn the things a crew member had to know. He'd stopped to work on the gyros. He'd slept a day and a half. The platform would take off in forty eight hours. It was common sense to use a man who'd had the full course of training if it could possibly be done. But it wasn't easy to take.
"I got a hunch," Mike said suddenly.
"Shoot it," said the Chief.
The others looked at Mike, all but Joe. He stared at a wall.
"There hasn't been just one set of guys trying to smash the Platform," said Mike. "There's been four or five. Joe found a gang working to wreck pushpots that didn't think like the gang that worked on Braun, say. And the gang that tried to kill us up at Red Canon may be another. There could be more. Fascists and commies and nationalists and what have you. And they all know now that they've got to work fast—even if they have to help each other. Get it?"
Haney growled.
"I'll buy what you've said so far," agreed the Chief. "But what about it?"
"Those so-and-sos will throw hi everything they've got at the last minute," said Mike coldly. "They've been sneaking. Now they'll get really rough! And I mean rough! But there aren't so many times when there aren't plenty of guys around ready to fight for the Platform."
"Shift change tune," said the Chief. "Of course. But which one?"
"Depends," said Mike. "The main thing is, if one gang starts something, the others have to jump right in. You
see?"
That made sense. One attempt at open violence, de-| feated, would create a rigidity of defense to make others impossible. If one attempt at violent sabotage was to be made, and others were in prospect, all would have to be timed to the first or else abandoned.
"I could set something up," said Mike. "We could get set to smash anything, an' then make sure we knew when it was gonna happen. Sally, does your father really
trust us?"
Sally nodded. "I told you, you may be the only ones
he reatty does."
"Okay," said Mike. "You tell him, private, that I'm settin' somethin' tricky. He can laugh off anything his security guys say I'm mixed up in. Joe'11 see that he gets the whole picture beforehand. But he ain't to tell anybody —not anybody!— that something is framing up. Right?"
"I'll ask him," said Sally. "He is pretty desperate. He's sure some last minute frantic attack on the Platform will be made. But—" a
"We'll tip him in plenty of time," said Mike with au- \ thority. "In time for him to play along, but not for a leak I to spoil things. Okay?" 1
"I'll make the bargain," Sally assured him, "if it can s
be made."
Mike nodded. He drained his coffeecup and slipped
down from his chair.
"Come on, Chief! C'mon, Haney."
He led them out of the room. Joe fiddled with his spoon for a moment. Then he said;
"The crewman I was to have subbed for if he didn't get well. He did get all right, didn't he?"
Sally said reluctantly, "Y-yes." •
"Well then," Joe said measuredly, "that's that. I guess I it will be all right for me to stick around and watch the *i* liftoff?" 1
Sally's eyes were misty. ,|

"Of course it will, Joe! I'm so sorry!" i
Joe grinned, but even to himself his face seemed like a mask.
"Into each life some rain must fall. Let's go out and see what's been done since I went to sleep."
They went out of the Platform together. And immediately they reached the floor of the Shed it was plain that matters were being lined up for something conclusive.
The top five or six storeys of scaffolding were already removed, and more of the girders and pipes were coming down in bundles on lines from giraffe-like cranes. There were some newtype trucks in view, too, giants of the type that carry ready mixed concrete through city streets. They were pouring paste in huge buckets that took it aloft, where it vanished into the mouths of tubes that seem to be replacing the scaffolding along the Platform's sides.
"They're lining the rockets," said Sally in a subdued voice.
Joe watched. He knew about this. It had been controversial, for a time. The Platform carried rockets to be used as the third stage of a multiple stage rocket complex, after the pushpots and their jatos had served as the first two stages. It would take off almost horizantally and gain speed on the way up to minimum airresistance, when the Platform would fire these solid-fuel rockets.
But it was not supposed to use rockets but once. It would never land. Not ever. And there would be men on board, to rule out ten and fifteen gravity acceleration. The Platform had to use a relatively long period of low acceleration rather than a brief, terrific burning of fuel. So its very special rockets had been designed as the answer.
They were solid fuel rockets, but like none ever used before. The pasty white stuff going up in buckets was a selfsetting refractory with which the tubes would be fined, with the actual fuel inside the fining. The tubes themselves were wirewound steel. When the fuel was fired, it would be at the open end of each rocket tube, and it would burn backward at so many inches per second. The refractory lining would resist the rocket blast for a certain time and then crumble away. And, crumbling, the refractory
particles would be hurled astern and so serve as reactic mass. When the steel outer tubes were exposed, they'c melt and be more mass thrown away behind.
It worked out that as the rocket fuel burned, the tubes that contained it dissolved into the blast and added to the accelerating thrust, even as they diminished the mass to be accelerated. Under the highly special conditions of this particular job, there was a notable gain in efficiency over liquid fuel practice. For one thing, the Platform would have no use for large-scale fuelpumps and tanks. By this arrangement, it wouldn't have them. And when it finally rode in space it would have disposed of every ounce of driving apparatus used to get it there.
Now the rocket tubes were being lined and loaded. The time to takeoff was growing short indeed.
Joe watched, and turned away. He felt a certain deep satisfaction because he'd finished his job and lived up to the responsibility he'd had. But he felt distinctly forlorn at the collapse of his hope to be one of the first men ever to make a real journey in space instead of a hop. *fie* couldn't resent the decision. He'd probably have made the same decision himself, though it wouldn't have been easy. But it hurt to have lost even the most improbable of hopes.
Sally tried to interest him.
"Those rockets hold a lot of fuel! And it's so much better than they thought a chemical fuel could ever be!"
"Yes," said Joe.
"Fluorine-beryllium," said Sally urgently. "It fits in with the pushpots having pressurized cockpits. Rockets like that couldn't be used on the ground. The fumes would be poisonous!"
But Joe only nodded in agreement. He was apathetic. He was uninterested. It occurred to him that Mike didn't feel any too happy, either. He could prove by mathematics that he and other valiant small men could have taken a ship out from Earth a long, long while ago. But he'd done his share to get the Platform aloft.
"Joe," said Sally unhappily, "I wish you wouldn't look like that!"
"I'm all right," he told her.
"You act like you don't care about anything!" she protested. "And you do!"

"Of course I do," he said. But he didn't mean it.
"I'd like to go outside somewhere," she said abruptly. "But after what happened up at the lake, I mustn't. Would you like to go up to the top of the Shed?"
"If you want to," he agreed without enthusiasm.
He followed when she went to a doorway in the side-wall. There was a security guard there. They began to walk up an inclined, endless, curving ramp. It was between the inner and outer skins of the Shed. There had to be two skins because the Shed was too big to be ventilated properly, and the hot desert sun would have made bad weather inside. There'd have been convection currents in the enclosed space, and minor whirlwinds, and even miniature thunderstorms and lightenings. Joe'd heard of such things happening in sheds built for oldfashioned rigid dirigibles before he was born. They'd been mentioned in technical articles about the Shed.
They came upon an open gallery, and there was a security man looking down at the floor and the Platform. He had a very good view of all that went on from here.
They went around another long circuit of the slanting walkway, which was vaguely lighted with small electric bulbs. They came to a second gallery and saw the Platform again. There was another guard here. They were halfway up the globular wall, now, and were visibly suspended over emptiness. The view of the Platform was remarkable. There were an astonishing number of rocket tubes being affixed to the outside of that giant structure. Three giant cranes, working together, hoisted a tube to the last remaining level of scaffolding. There, men swarmed out to it and on it. They fastened it to the swelling hull. As soon as it was fast, other men swarmed into it with the white doughy stuff to line it from end to end. The rockets would nearly hide the ship they were designed to propel. But they'd be burned completely away when it reached its destination.
"Wonderful, isn't it?" asked Sally hopefully.
Joe looked, and said without warmth, "It's the most wonderful thing that anybody ever tried to do." Which was true enough, but the zest of it had unreasonably departed, for now. His disappointment was new.
Halfway around again, Sally stopped at a door and opened it, and Joe was almost surprised out of his lethargy. Here was a watching-post on the outside of the monstrous halfglobe. There were two guards here, with fifty calibre machineguns under canvas hoods. Their duties were tedious but necessary. They watched the desert. From this height they could see for very many miles, and Bootstrap was even visible as a series of white specks far away, with hills behind it.
Ultimately they came to the very top of the Shed, and out into the open air. From here the steel plating curved down and away in every direction. The sunshine was savagely hot, but there was a breeze. Part of an acre of the Shed's rounded top was fenced in, and there were small buildings with innumerable antennae for the reception of every possible wavelength, and those extraordinary shapes which follow satellites in space and by measuring phase differences determine their distance within inches, even hundreds of miles away. There were, too, those even more improbable gadgets which receive telemetered information from beyond the blue of the sky. And of course there were radar bowls turning restlessly to scan the horizon, and one that spun and changed and scanned the sky itself. Sally pointed out a waveguide radar which could spot a plane within three feet at a distance of forty miles or more. And she said that out of sight behind a plastic dome there were the new radars which could actually detect and locate moving objects far below the horizon. But that was so secret that even she had never seen it.
There were guns, also, sunk down in pits so their muzzles wouldn't interfere with radar. There were enough nonrecoil weapons here to defend the shed against anything one could imagine, *if* anything could get through the missile batteries on the desert round about.
Joe felt an odd surprise. He'd thought of the Platform as a construction job. But it was much more. And it was ironic that it had to be guarded, because it was actually the only hope of escape from atomic war. But that was why some people hated it, and their hatred had turned it
into an item of national defense, and that was why the United States Congress had provided the money to build it. But the greatest irony of all was that its most probable immediate usefulness would be that it would make possible certain nuclear experiments it wasn't safe to make on Earth. And if they were

successful, they should mean that everybody in the world would become rich beyond envy.
But Joe couldn't react to these angles. He was drained of all rejoicing because he'd lost a certain flimsy hope of being aboard the Platform when it went up.
He didn't really feel better until a certain change shift time still in the future. Then he'd realize that life was real and life was earnest because a panting man was trying to tear out bis jugular vein with his teeth. At that tune Joe was hampered in Ms selfdefense because a large number of battling figures trampled all over him and his antagonist together. And this was underneath the Platform, and he expected to be blown to bits any instant.

II

JOE SAT on the porch of Major Holt's quarters in the area next to the Shed. It was eight thirty, and dark, but there was a moon and Joe had come to realize that his personal disappointment was only his personal disappointment, and he had no right to make a nuisance of himself about it. So he talked about other matters. But with the Shed rilling half the sky behind him, and a just-past-full moon newly risen to the east, it would not have been natural for him to speak of purely earthly things.
"It's going to take time to get started," he said yearningly. "If the Platform goes up day after tomorrow, it'll leave a lot of stuff behind, and it'll have to be ferried up."
Sally stirred. Joe added absorbedly, "Getting somebody somewhere for a quick look, and then getting him back, _it's not enough. The moon, now. We can get a man there and back. But it won't take too many payloads to the Platform to fix things so we can send men to the moon and keep them there. That'll mean something!"
It would. The whole point of exploration is the blazing of a trail for others to follow and to occupy. That was why the Platform was more than the launching of a satellite of larger size than ordinary. It was a different kind of thing. Send up so many ferry rocket cargoes of fuel, and first settlers would be able to move away from Earth to back up an explorer with colonization. Which was a dream, to be sure, and many people don't want to risk spoiling a romantic daydream by turning it into fact, *'i* But Joe didn't feel that way. He was disillusioned, now. He | wouldn't be the one to take off from the moon. But some- f body would.
"I suppose," said Sally tentatively, "you'll try to get into the ferry service."
* "I'll try," said Joe. "But I won't hope much. There are astronomers and physics sharks and such who'll be^ glad to swab decks on a ferry ship to practise their specialties out of atmosphere."
"I don't seem to be able to say anything to make you feel better!" said Sally.
Joe turned his head to look at her.
"But you do." He said grandiloquently. "If it were not for your unflagging faith hi me, I wouldn't have the courage to bear the burdens of everyday life."
She stamped her foot.
"Stop it!"
"All right." But he said quietly. "You are a good kid, Sally. You know it. It's not bright of me to mourn."
She drew a deep breath.
"That's better! Now, I want—"
A gangling figure approached on the concrete walk between the trim, monotonous cottages that were officers' quarters.
Joe said sharply, "That's Haney! What's he doing here?" ; He called. "Haney!" |
Haney's manner took on purpose. He came across the grass. The lawns around officers' quarters contained the only grass for many miles around.
"Hiya," said Haney uncomfortably. He spoke politely to Sally. "Hiya. —Uh—Joe, do you want to get in on the party?"
"What kind?"
"The party Mike was talking about," said Haney. "He's set it up. He wants me to get you and a kinda—uh— undercover tipoff to Major Holt."
Joe bunked. Sally said hospitably.

"Sit down, won't you? You noticed that my father gave you full security clearance, so you can go anywhere."
Haney perched awkwardly on the edge of the porch.
"Yeah. That's how I got here. Mike's on top of the world."
"Shoot it," said Joe.
"You know he's been pretty bitter," said Haney carefully. "He's been saying that little guys like him ought to be the spacemen. There's quite a bunch of fellas his size working on the Platform. They can get in cracks and buck rivets and so on. Useful. He's had them all hopped up on the idea that the Platform coulda been finished months ago if it'd been built for them, and they could go places fullsized guys couldn't make rockets to go to, and so on. Remember?"
"I remember," said Sally.
"They've been beefin' about it," explained Haney. "People know how they feel. So today Mike went and talked to one or two of 'em. And they started acting mysterious, passing messages back and forth, and so on. Little guys, acting important. Security guys wouldn't notice 'em much. You can't take a guy Mike's size serious, unless you know him. Then he's the same as anybody else. So the security guys didn't pay any attention. But some other guys did. They ~saw the little fellas acting like they were cooking up something fancy. And they bit."
"Bit?"
"Got curious," explained Haney. "So Mike and his gang got confidential. They're getting even for being laughed at, see? They say if the Platform is fixed so it can't go up, the big brass will have to let 'em take a ferry rocket up in a hurry, and get it in orbit, and use it for a Platform until the big Platform can be mended and set up. Once they're up there, there's no use trying to stop the real Platform. So it can go ahead." "I think I see," Joe said doubtfully. "Mike and his gang are being saps—on purpose. If anybody's going to pull some fast stuff, that's the tune everybody's got to. Last chance. So Mike and his gang don't know what's going to happen, but they sure know whenh They're inviting the real saboteurs to make fools of 'em. And what'll happen?"
Joe said drily, "The logical thing will be to feel sorry for the big guys." j "Uh-huh," said Haney, deadly serious. "Mike's story is there's half a dozen rocket tubes already loaded. They're going to fire those rockets between shifts. The Platform: gets shoved off its base and rnaybe dented and so on. And then Mike's guys say they've got the figures to prove' they can go up hi a ferry-rocket and be a Platform, and the big brass won't have any choice but to let 'em." \ Sally said, "I don't think they know how the big brass' thinks." v Haney and Joe together said, "No!" and Joe added, "Mike's not crazy. He knows better. But it's a good story for somebody who don't know Mike."
Haney said painfully, "I came out here to see if the Major will play along. The Chiefs got a gang, too. There's Indians of his tribe on the job. No doubt about them, either! And there's Joe and me. The point is that Mike's stunt makes it sure that everything busts loose at a time we can know ahead. If the Major plays along, and then in the last five minutes does his own stuff,—so it can't leak out ahead of time and tip off the guys we want to get—we ought to knock off just the expert saboteurs who know the weak spots in the Platform. Who know, say, that thermit in the gyros would mess everything up all over again."
Joe said quietly, "But the Major has to know hi advance. That's flat!"
"Yeah," agreed Haney, "but also he has to not tell anybody else. There've been too many leaks before! You know that!"
"I should," admitted Joe. He said, "Sally, see if you can get your father to come here and talk. Haney's right. Not in his office. Here."
Sally got up and went inside the house. She came back with an uneasy expression on her face.
"He's coming. But I couldn't tell him what I wanted, and I'm not sure he'll be in a mood to listen."
The Major arrived in minutes. And he was not in a mood to listen. He was a harried man, and he was keyed up to the limit by the multiplied strain now existing. He came to his house from a grim conference on how to prepare against last minute sabotage—and he ran into a proposal to stimulate it. He practically exploded. Even if provocation should be given to trap saboteurs, this was no time for it! And if it were, it would be security business! It should not be meddled with by amateurs!

"I don't mean to be disrespectful, sir, but you've missed a point," Joe said grimly. "Something's going to be tried before the Platform goes up. You know it! You can't know what the saboteurs will try, but this will tell you when! Because every one of them will try his trick under cover of what every other one is doing at the same instant."

He paused. Then he said fiercely, "And you know your office leaks! You couldn't set up a trick like this through security methods. And for a third fact, this is the one sort of thing no saboteur would except from you. We caught the saboteurs at the pushpot field by'guessing at a new sort of thinking at work. Here's a chance to use a new sort of thinking against the saboteurs who are working their heads off right now planning what to do before launch time!"

Major Holt was not an easy man to get along with at any time, and this was the worst of all times to differ with him. But he did think straight. He stared furiously at Joe, growing crimson with anger at being argued with. But having stared for a full minute, the flush slowly left his face. Then he nodded abruptly.

"You have a point," he said curtly. "I don't like it. But it is a point. It would be the reverse of anything my antagonists could imagine of me. We'll try it."

He settled down for a comprehensive survey of what was to be done. In careful consultation, they worked it out. The all important part was that the Major's part was to be done in completely unorthodox fashion. He would take such-and-such actions to mesh his measures with those of Mike and the Chief and Joe. They would do such-and-such, and such-and-such. The Major would give each order personally, and all within the last five minutes before shift change time. No order would be given by anybody else to anybody else. Every order would mean nothing intelligible to its recipient until the time came to carry it out.

It was not an easy program for the Major to bind himself to. It ran counter to every principle of military thinking save one—that it is a good idea to outguess the enemy. At the end he said coldly.

"This is distinctly irregular. It is as irregular as anything could possibly be. But that is why I've agreed to it. It will be at least unexpected, coming from me!"

He went striding down the concrete walk to where his car waited.

Haney left a moment later, to carry the arranged-for details to the Chief and to Mike. And Joe went presently into the Shed for his part.

There was no particular difference in the appearance of the Shed by night. In the daylight there were rows of win-dowlights in the roof, which let in a dusky and inadequate twilight. At night those windows were shuttered. By day the shadows were a little sharper and the contrasts of light and shade were more abrupt, but that was all. The only changes Joe could see were the normal ones of more scaffolding removed and more rocket tubes attached.

He went to look at the last pushpots, and they were ready to be taken over to their flightiest before use. These were extras, anyhow, and beyond the number needed to lift the Platform. He found himself considering the obvious

fact that after the Platform was aloft, they'd be used to . launch the ferry rockets too.

Then he moved toward the center of the Shed. A whole level of scaffolds came apart and its parts were lowered to the ground while he watched. Slings lowered the bundles down to waiting trucks|"which would carry them elsewhere. There were mixing trucks still pouring out their white paste to be the linings of the rocket tubes. Their product went up and vanished into the gaping, wirewound rocket tubes.

Presently Joe went into the maze of piers under the Space Platform itself. He glanced at his watch. He came to the temporary stairs he had reason to remember. He nodded to the two guards there.

"I want to take another look at that gadget we installed."

The guard said good-naturedly, "Major Holt said you had top clearance."

Joe went up and in and along the curious corridor that had handgrips on walls and ceiling and floor, for the conditions to be experienced out in emptiness. He headed for the engineroom, and heard voices speaking a completely unintelligible language. He tensed.

Then the Chief grinned at him. He was in the engine-room and with him were nearly a dozen men of his own coppery complexion.

"Joe, meet some friends of mine." As Joe shook hands all around the Chief identified friends called

Charley Spotted Dog, and Sam Fatbelly and Luther Red Crow and other exotic things. He said exuberently; "Major Holt told the guards to pass me in with some of my Indian friends, so I took 'em on a guided tour. None of 'em had seen the inside like it is now."
"I heard you talking Indian," said Joe.
"You're goin' to hear some more," said the Chief. "We're the first warparty of my tribe in longer than my grandpa would've thought respectable!"
Joe found it difficult to smile.
"Fella, this bothers you because it ain't organized." The Chief said benignly; "Don't let that happen! That's the
trouble with the world, figurin' out everything by slide-rule and such. Maybe it's civilized, but it ain't human, jj Quit worryin'. This is going to be primitive and untidy and a lot of things, but it'll be fun! You go pick up that security guy the Major was going to send to meet you."
He escorted Joe to the corridor again. Joe noticed that each of the Chiefs fellow Mohawks had somewhere about his person an eighteen inch stilson wrench or a reasonable facsimile. They were the nearest things available to tomahawks. They grinned happily at him as he departed.
At the bottom of the steps there was now a third security man. He greeted Joe. Joe led him aside and asked him his orders.
"I'm to get as many security men as I can find, stick them out of sight under the Platform here, and tell them to turn off their walkie-talkies and wait. No matter what happens, they're to wait right here for what they're needed for—right here." !
Joe nodded. He looked harassedly around him. The se- •; curity man beckoned to another agent. This was close < tijning. Something made Joe look up. He saw the catwalk gallery in the side of the Shed. The expected guard was there. Haney, though, was with him. There was nothing else in sight, but Haney was on the job. He saw a security man step out of sight in the scaffolding. He saw his own assigned security man waylay another, who came to Joe. *J*
Minutes passed. Only Joe would have noticed, but ; there were eight or nine security men nearby. The last ; of them was in the act of turning off his walkie-talkie. ; He had orders to obey only Joe if an emergency arose, i Gongs began to ring somewhere in the Shed. All ; around its edge they set up a horrendous clanging. And this was not an alarm, but simply the notice of change \ shift time. j
The noises overheard changed. A crane pulled back. •-, Hammerings lessoned and stopped. There were the sounds'\ of pipes in bundles being lowered to the floor. The crane's .; internal combustion engine stopped. Its operator stepped j down to the floor and headed for the exit. Hoists de-
scended and men moved away from them. Some men came down ladders. The floor became dotted with figures headed for the doors through which men went out to get on the busses for Bootstrap.
Nothing happened. Long minutes passed. The shift brought out by the busses was going through the check-over process in the incoming screeningroom. Joe knew that within the past five minutes Major Holt had gathered together a tightly knit bunch of security men to be available for anything that might turn up, and that the men doing the normal shift change screening were short handed in consequence. But there was an armed reserve ready for anything that might turn up.
The floor next to the exits became crowded, but the central part of the floor was clear. One truck seemed stalled by the swinging truck doors. Its driver ground the starter insistently.
There was a high pitched yell away up on the Platform. Then a shot. Its echoes rang horribly in the resonant interior of the Shed. Joe's own special security man hurried to him.
"What about that?"
"Hold everything," said Joe grimly. "It's taken care of."
It was. Mike's gang of miniature humans had popped out of hiding to meet their alleged associates in sabotage. But they came out to offer battle. One of the associates drew a gun and fired. Mike's gang surged into conflict. And they had help. Dark skinned men appeared with stilson wrenches to be used in the manner of tomahawks. They used them.
The security man's walkie-talkie made a buzzing sound under his shoulder. He reached for it.
"Forget that!" snapped Joe. "That's not for you! You've orders! Stay here!"
There was a sudden growling uproar where men crowded to get out of the Shed. Thick, billowing smoke arose. There was a sudden explosion. The men eddied and milled about.

The motor of the stalled truck caught. It moved toward the door, which opened, swinging up and high. Two trucks
came roaring in. They raced for the Platform. And as they raced inside their seeming loads clattered off and were mere flimsy scenery and men showed where the loads had been. The guards by the doorway began to shoot.
"That's what we've got to stop!" snapped Joe.
He began to run, his pistol drawn. There was suddenly a very small army which materialized under the Platform, Joe caused it to be gathered. It ran to guard against this well planned invasion.
There was the harsh, tearing rattle of a machinegun from somewhere high up. Joe knew what that was, too. Mike's whole scheme had been intended to force all sabotage efforts to take place at the same moment, and to prepare *in* secret for anything that could be attempted. Part of the preparation was for Haney to drag in machine-guns from an outer watching-post, and mount them to cover the interior of the Shed.
Those machineguns flung fifty calibre slugs at the trucks. Splinters sprang up from the woodblock floor. Then, abruptly, one of the trucks vanished in a monstrous, actinic flash of blue white flame and a roar so horrible that it was not sound but pure concussion. The other truck heeled over and crashed from the blast, but did not explode. Men jumped from it and there must have been screamed orders, but Joe could hear nothing at all. He only saw men waving their arms, and others seized things from the toppled load and rushed toward him, and he began to shoot as he ran to meet them.
Now, belatedly, the sirens of the Shed set up their alarm, and choppy yappings began and went up hi pitch. Over by the exit, pistols cracked. Something fell with a ghastly impact not ten feet from where Joe ran. It was a man's body, toppled from somewhere high up on the structure that was the most important manmade thing in all the world. An utterly barbaric warwhoop sounded among the echoes of other tumult. A security man shot, and one of the running burdened figures toppled and slid. His burden, which must have been a bomb, rolled ridiculously. There had been two trucks plunging in the swingup door. It was plainly accord-
ing to plan. They had raced for the space under the Platform at the one time when they should be clear, because all work had stopped. Under the Platform, the trucks were to have been detonated. At the least, they should have rent and torn the Platform past immediate launching. They might have broken its back. And surely one of them should have made it.
But there were machineguns ready trained to shoot and now the load of attackers from the overturned truck scurried for the Platform with parts of its cargo. If they could fight their way inside, they could blast its hull open or demolish its controls and so expose it to further and even more successful attack.
There were other pistol shots. A group of men fought . out of the incoming screenroom and raced for the center of the Shed. Later it would be found that they had slabs of explosive under their garments and detonation caps to set them off with, if they could fight their way into the vessel designed to become a moon. But now another door opened, somewhere, and security men came out with crackling weapons. Major Holt led them. He'd intended to fight off the truck borne attack, but he was bound to be too late. He attacked the men on foot, while Joe's followers worked over the men with bombs.
Joe stumbled, and fell, and heard guns crackling, and as he scrambled up he pitched into a running figure that snarled as he hit it. Then he was fighting for his life.
This was almost under the Platform and in the midst of confusion many times compounded. Joe caught a wrist that had a gun in it, and he knew that his assailant had a bomb slung over his shoulder, but right now he had both hands free. Joe instinctively tried to batter his enemy with the pistol he carried, instead of putting its muzzle against the other man's body and pulling the trigger. He struck a flailing blow, and his hand and the pistol struck a scaffold upright on the floor. The blow cut his knuckles open and he felt the weapon slipping from his grasp. Then his enemy brought up a knee, but it hit Joe's knee instead of his groin, and he flung himself forward and they went down to the ground together.
There was fighting all around them. Once the machine-guns rasped again. This was more tracer bullet fire, when the panicked men by the exit tended to surge out away from the outgoing doors. The tracers marked a line they must not cross. They stopped. Once a weapon flashed so close by Joe's eyes that it blinded him.

And once somebody fell over both himself and his antagonist, who writhed like an eel and seemed possessed of desperation beyond belief.
Joe could really know only his own part in the struggle, down in the murky tangle of the scaffold base. But there was fighting up on the Platform itself. A savagely grinning Mohawk wrestled with a man on one of the rocket tubes, and somehow an incendiary device in the other man's pocket became ignited. It glowed white hot and he screamed as it burned its way out of his clothing. The Mohawk flung the man fiercely clear, to crash on the far distant floor, and then kicked the incendiary off, and it fell after the man and hit the floor and burned there. It was thermit, and it surrounded itself with a column of acrid smoke from bubbling woodblocks.
There was fighting by the exit doors. There was an uproar in the incoming screening-room, and a warwhoop from the top of the Platform. Somebody, somewhere, tried to crawl into an airlock entrance, and he got his head and shoulders in, and a copper skinned man held his forehead still and chopped down on his neck with the side of his hand. All underneath the Platform was a panting chaos, with pistol shots and hand-to-hand fighting everywhere. Four invaders got to the bottom of the wooden steps, where there were two guards. Two of them rushed up the steps, two guards and their two companions stayed behind, permanently. But the Chief appeared. He swung an eighteen inch stilson wrench exactly like a tomahawk and let it go at one of them. He jumped down sixteen steps and hit the body of the other man with his feet. A gun flashed, but then there was only squirming struggle on the floor.
Mike, inside the Platform, found a bloodied, panting, desperate man who'd somehow gotten inside too. And
Mike brought himself to height by swarming up two steps of a ladder and brought down the spanner on his unsuspecting victim, and then stayed on guard until somebody should arrive who was big enough to carry the saboteur away.
All this while Joe struggled with only one man. It was a horrible struggle, because the man had a bomb and he might manage to set it off 'or it might go off of itself. It was nightmarish because the man had the strength and desperation of a maniac, and practised appropriate tactics. Joe pounded his hand, holding a pistol, upon the floor until the gun fell away. It hit something and exploded smokily and fell clear. But it was no improvement.
While struggling to shoot Joe, his antagonist had had only five fingers with which to try to gouge out Joe's eyes or tear away his ears or rend his flesh. But with no pistol he had ten, and he fought exactly like a madman or a wild beast. He even smelled alien.' He began to pant, thick, guttural pantings that had the quality of hellish hate. And then there was a rushing of bodies which was Major Holt's reserve arriving very late in the center of the Shed. Struggling figures trampled all over the pair who fought on the ground, and a heavy boot jammed down Joe's head, and he felt teeth sink in his throat.
Joe used his knee in a frenzy of revulsion—used his knee as the other man had tried to use his in the first instant of the battle. The man under him screamed as an animal might, and Joe jerked his bleeding throat free. In a sort of hysterical horror he pounded his antagonist's head on the floor.
Somebody shouted at him: "Quit it! Quit it! He's out!"
"It's about time you guys got here!" Joe panted. "This man came in on that truck. Watch out for the bomb he's got slung on him ..."
The Chief helped him to his feet. The uproar was diminishing. The noise dwindled magically. Somewhere there were a couple of pistol shots. Then nothing more.
It seemed to be all over.

12

THE INCOMING shift had a messy cleanup job to do. It was accomplished only because security men took over the work of gang bosses and all ordinary labor on the Plat-form was put aside. Even that would not have been work-1 able but for the walkie-talkies the security men wore. As| the situation got sorted out, it was explained to them, and] they relayed it for the satisfaction or the curiosity of those! who worked under them. No work, no news. It produced a high degree of cooperation.
There had been four separate and independent attempts"; to wreck the Platform at one and the same time.

One 'was the plan of those sympathetic characters who'd volunteered to help Mike and his friends win to the status . of spacemen by firing the Platform's rockets in the shed. , There were not many of them and they'd lost heavily.] They'd had thermit bombs with which to destroy the] Platform's vital machinery. Ultimately they talked freely if morosely, and that was that.

There'd been a particularly ungifted attempt to cause panic in the incoming shift. Somebody'd tried to stampede the men hi the inward screening room by firing revolvers in the crowd there, expecting a panicky crashing into the Shed. Among the inwardbound shift there were gentlemen with slabs of explosive under their shirts. They'd expected to get into the Platform with it. They didn't. They ran into Major Holt's reserve of security men and got nowhere. The creators of panic with revolver shots were finally rescued from their shift-mates and more or less scraped up from the floor—they were hi very bad shape— and carted off to be patched up for questioning. The members of this group had been impractical idealists, with such characters' extremely low opinion of their fellow- ,

men. Many of them lost their nerve, anyhow, as was evidenced by abandoned explosives and detonators in the lockerroom.

The most dangerous attempt was, of course, that perfectly planned and coordinated assalt which happened to have been carried out at its original time, neither hastened nor delayed by Mike's activities. That plan had been beautifully contrived, and would certainly have been successful but for the machineguns and their tracer bullets from high in the Shed's sidewall, and after that the fight Joe's followers put up underneath the Platform.

This plan used three separate units with perfect timing. There'd been the man in the stalled truck. He'd caused the swingup door to open at the precise instant the doors needed to be opened. The explosive laden trucks had raced in at the most promising instant for their dash to get underneath the Platform and detonate their cargoes. There'd been a perfect diversion planned for that, too. Smokebombs and explosions in the outgoing screening rooms should have drawn every security man in the Shed to stem the tumult. Mike's trick, then, had brought some saboteurs into the open, but merely happened to coincide with the most dangerous and well organized attempt of all. But it was due to his trick that the Platform was not now a wreck.

There was another break which was sheer coincidence. It was a discovery that couldn't have been made except after chaos artificially contrived. Further, it required Joe to react hi a personal way to the way his individual antagonist had fought. One expects a man to fight fair by instinct and turn to fouls—if he must—in desperation only. But Joe's opponent hadn't tried a single fair blow. It was as if he'd never heard of combat that was not murder and mayhem. Joe felt an individual enmity to him.

He didn't consider himself the most urgent of the injured, but Sally was there to help the nurses and she went deathly pale when she saw his bloodstained throat. She dragged him to a doctor and the doctor dropped everything at once.

It still didn't seem bad to Joe. The antiseptics hurt and the stitching was unpleasant, but Joe was more worried

by the fact that Sally was standing by and suffering for him. When he got up briskly from the emergency operating table, the doctor nodded grimly to him.

"That was close! Whoever chewed you was working for your jugular, and he was half-way through its wall when he stopped. A fraction of an inch more and he'd have had you!"

"Thanks," said Joe. His neck felt clumsy with the bandages on it, and when he tried to turn his head the stitches hurt.

Sally's hand trembled on his arm when she led him away.

"I didn't think I'd ever dislike anybody so much," said Joe angrily, "as I did that man while he was chewing my throat. We were trying to kill each other, of course, but, confound it, people don't bite! But he did!"

"Did you kill him?" asked Sally in a shaky voice. "If you did, I don't mind! He should have been—"

Joe halted. There was a row of stretchers. It wasnt too long a line, at that. There was room left^for more in the emergency hospital space. But Joe looked down at the man who'd fought him. He was still unconscious.

"There he is," he said irritably. "I banged him pretty hard. I don't like to hate anybody, but the way he fought—"
Sally's teeth chattered suddenly. She called to one of the security men standing guard over the stretchers. "My—my father is going to want to talk to this man," she said unsteadily. "Don't let him be taken away to thej hospital until my father knows! Please!"
She started away, her face deadwhite and her hand] stonecold.
"What's the matter?" demanded Joe, following her. "S-sabotage," said Sally. Her tone was indescribable.! It had a hint of heartbreak in it.
She went into her father's office alone. She came out] again with him, and he looked stricken. His secretary j was with him, too. Her face was like a mask of marbl She had been a plain woman, and a gloomy one, and morbid one, but at the look on her face Joe turned awa; his eyes.
Then Sally was crying beside him, and he put his arm comfortingly about her and let her sob on his shoulder. But he was completely puzzled.
He didn't find out until later what the trouble was. It was that the man who'd tried so earnestly to tear out his throat was Miss Rose' husband. Her proper married name, obviously, was not Rose. She'd met him during a vacation—the latest one she'd taken—and he was a refugee with an exotic charm that would have fascinated a much more personable woman than Miss Rose. They had a whirlwind courtship and wedding, and after they were married he confided that he lived in deadly terror of emissaries from his native country who might kill him. And of course she was more f ascinated still.
Then, when she went to her new assignment at the Space Platform's Shed, he vanished. Her telephone rang and his anguished voice told her he'd been abducted and if she told the police she'd be tortured to death. He begged her not to do anything to cause him more horrible torment than was already his.
She'd been trying to keep him alive ever since. Once when she couldn't bring herself to carry out an order she'd been given, she received a severed human finger in the mail, and a scrawled and bloodstained note which described unspeakable torment and begged her not to doom him to more.
So Miss Rose had been giving information to one group of saboteurs all the time.
But her husband wasn't a captive. He was the head of that group of saboteurs. He made love to her and married her merely to prepare her to supply the information he needed. And he had only to write a sufficiently agonized note, or at worst gasp tormented pleas on a telephone, to get her to perform any action he desired.
Incidentally, he still had all his fingers when Jim knocked him cold.
Sally had recognized him as the subject of a picture she'd seen on Miss Rose's desk. Miss Rose had hidden it hastily—she'd been crying over it—and told her it was someone she'd loved who was now dead. And this whole disclosure could only have come about by accident,
after some such event as had taken place about the
Platform.
At the moment, though, there was that gigantic object to be gotten aloft. And there was plenty of work to do. There were some small tears in the plating, caused by fragments of the exploded truck. There were* some bullet-holes. The Platform could resist small meteorites at forty-five miles a second, but a .45 caliber bullet could puncture it. These scars of battle had to be welded shut. The rest of the scaffolding had to come down and the rest of the rocket tubes to be affixed and lined and loaded. And there was Cleaning up to be done.
These things occupied the shift that came on at the time of the multiple sabotage assault. At first the work was ragged. But the device of turning security men into news broadcasters worked well. After all, the Platform was a construction job. The men who worked on it were not softies. Most of them had seen men killed before. Before the shift was half over, a definite ^workrhythra was evident. Men had begun to take an even greater pride in* the thing they had built, because it had been assailed and not destroyed. And the job was almost over.
Sally went back to her father's quarters, to try to sleep. Joe stayed in the Shed. His throat was painful, so he didn't want to go to bed until he was genuinely tired. And he was thoroughly wrought up.
Mike was peacefully asleep, curled up in a corner of the outgoing screening room. His fellow midgets

talked satisfiedly among themselves. Presently, to show their superiority to mere pitched battles, they brought out miniature packs of cards and started cardgames while they waited for busses to take them back to Bootstep.
The Chiefs Indian associates loafed comfortably while waking for the same purpose. Later they would put in for overtime, and get it. Haney mourned that he had been remote from the scene of action, and was only responsible for the presence and placing of the machineguns which had very definitely kept the Platform from being blown up from below.
It seemed that nothing else could happen to bother anybody, but there was one thing more.
That other thing happened just two hours before it was time for the shift to change again, and when normal work was back in progress in the Shed. Everything seemed fully organized and serene. Everything inside the Shed was settled down, and nothing had happened without.
There was ample exterior protection, of course, but the outside guard systems hadn't had anything to do for a very long time. Men at radarscreens were bored and sleepy from sheer inactivity. Pilots in jet planes two miles and five miles and eight miles high, had long since grown weary of the splendid view below them. After all, one can get used to late, slanting moonlight on cloud masses far underneath and bright and hostile seeming stars overhead.
So the thing was well timed.
A Canadian station noticed the blip on its radar-screen first. The observer was puzzled by it. It could have been a meteor, and the Canadian observer at first thought it was. But it wasn't going quite fast enough, and it lasted too long. It was travelling under four miles a second, and the minimum speed for meteors is seven. It was headed due south at a hundred and twenty thousand feet. The speed might have been reasonable if it hadn't stayed constant. But it did. There was something travelling southward at four miles per second. It didn't slow. It didn't drop.
The Canadian radarman debated painfully. He stopped his companion from reading a magazine article about the cultivation of lobelias. They discussed it. They decided to report it.
They had a little trouble getting the call through. They became obstinate and insisted. They reported to Ottawa that an object at a hundred and twenty thousand feet was headed south at four miles per second.
There was a further timeless. Somebody in authority had to be waked up. It was accomplished, and a sleepy man in his pajamas said drowsily; "Oh, of course tell the Americans. It's only neighborly!" and padded to his bed to go to sleep again. Then he waked up suddenly in a cold sweat. He realized that this might be the beginning of atomic war. So he set phonebells to jangling
furiously all over Canada, and jet-planes began to boom in the darkness. But jets don't travel four miles a second, nor at a hundred and twenty thousand feet. .
There was only the one object in the sky. It was quite I enough. Over the Dakotas it went higher—to a hun- ' dred forty thousand feet. How this came about is not completely understood, because not all the details of that flight are known. But something like jatos must have fired. And then it started down in a trajectory like that of an artillery shell, but with considerably higher speeds than artillery shells achieve.
It was about this time that the siren in the Shed began its choppy, hiccoughing series of warmup notes.
The news from Canada had arrived. Men were already tumbling out at at least seven airfields, buckling chutepacks and hoping their oxygen tanks would function properly. The radars atop the Shed picked it up.
Small blue white flames; began to rise from the ground and go streaking away in astonishing numbers. ,__
The covers of the guns at the top of the Shed slid aside.
Miles away, jet planes shot skyward. But things travelling
at four miles per second are not easy to anticipate. They
aren't targets by any normal standard.
It didn't look good.
Inside the Shed the sirens howled and all the securit men were snapping.
"Radar alarm! All out! Radar alarm! All out!" And men were moving fast. Some came down from the Platform on hoists, dropping with reckless speed to th'el floor level. Some didn't wait. They slid down one upright! swung around the crosspiece and slid down another verJ tical pipe. For a minute or more it looked as if the scat! folds oozed black droplets which slid down its pipes* But the drops were men. The floor

became speckled and spotted with men running for the exits.
The siren ceased its wailing and its noise went down | and down to a baritone moaning, and that ended. Then ' there was no sound but men moving to get out of the Shed. There were trucks, too. Those that had been loading with dismantled scaffolding roared for the doors to get out and
away. Some men swung on them as they passed. The exit doors swung up to let them go.
But it was quieter in the Shed, at that, than when work went on. The voices of security men hurrying the work-crew could be heard. There was less to hear than ordinary. And it was a long distance across the floor.
Joe stood with his fists absurdly clenched. This could only mean an atom bomb attack. It wouldn't be one of the supposedly dead artificial satellites, turning and diving down out of orbit. There'd been tests of that principle, and it didn't work well. This came across Canada, heading down for the Shed. Somebody meant to find out if a missle at four miles per second could be knocked down. If it couldn't, the Platform wouldn't go up. There'd be a monstrous crater, made most likely by a fifty kil-oton explosion, and there wouldn't even be wreckage or debris where the Shed had stood.
If the missle got here, there'd be no point in getting outside. Nobody could conceivably get out of the total destruction area in time.
Joe heard himself raging. He thought of Sally. She'd be in the area of annihilation, too. And Joe knew such hatred and such fury—because of Sally—as made him forget everything else.
He couldn't run. He couldn't escape. He couldn't fight back. But because he hated, he had to do something to defy.
He found himself moving toward the Platform, his jaws clamped tightly. It was pure, blind, instinctive defiance.
He wasn't the only one to have that reaction. Men running toward the sidewall exits began to get out of breath from their running. They slowed. Presently they stopped. They scowled and raged—like Joe. Some of them looked with burning eyes up at the roof of the shed, though their thoughts went beyond it. The security men repeated, "Radar alarm! Radar alarm! All out!"
Somebody snarled, "The hell with that!"
Joe saw a man walking in the same direction as himself. He was moving deliberately back to the Platform. Somebody else was heading back.
Very peculiarly, almost all the men on the floor ceased
•"£
to run. They tended to gather in little groups. They knew •″. flight was useless. They talked briefly. Profanely. Here and there men started disgustedly back toward the work Tt they'd dropped. Their lips moved in expressions of fur- • ious scorn. Then: scorn was of themselves.
There was a gathering of men about the base of the framework still partly veiling the Platform. They tended to face outward, angrily, and to clench their fists.
Then somebody started an engine. A man began to i climb furiously back to where he had been at work. Quite unreasonably, other men followed him. ; Hammers began defiantly and enragedly to sound. i
The workcrew in the Shed, or a very considerable part of it, went defiantly and furiously back to work. A clamor set up which was almost the normal working noise. It was the only possible way in which these men could express the fury and contempt they felt for anybody who'd try to smash the thing they worked on.
But there were other men wh® did more. There were three levels of jet planes above the Shed, and they could diye. The highest ones got first into the line along which the missile was plunging toward the Shed. Those planes set themselves on collision courses and let go their wing-loads of rockets. They peeled off and got out of the way. Seconds later others from the jet umbrella got into line. A tiny spray of proximity fused rockets blazed furiously toward the invisible enemy.
There were streaks of fire, lighting up a countryside. Countermissile missiles took off from modestly hidden silos near the Shed. They slid skyward, accelerating preposterously. They vanished among the stars.
And these defending plane carried rockets, and the much larger and more powerful ground-to-air missiles

had one; very great advantage. It countered the four mile per second speed of the enemy as an aid to evading counterfire. Interception of an intercontinental missile travelling at that speed would have been nearly hopeless, had crossfire been the only possibility. But the plane rockets—tiny things—and the larger counter missiles, were going up from the target itself. Defending rockets aimed to dive down the throat of the intruder.

They did.

The approaching missile plunged into a miniature hail of rockets. There were a dozen explosions which were pure futility. But then came a spread of larger missiles from the silos about the Shed. Six - eight - ten.

There was an explosion of a ground-to-air missile something over thirty feet long. Nobody saw it. It would have blasted half a city, but it was puny besides the detonation its own explosion set off. A fifty kiloton fusion bomb went off effectively beyond the atmosphere. It made a big blaze of such incredible incandescence that the aluminum paint on jet planes miles below it was scorched and blistered instantly. The light of that flare was seen for hundreds of miles. The second—later on—was heard farther still. And the desert vegetation miles below it showed signs of searing when the morning came.

But the thing from the north was vaporized, utterly, some forty five miles from its target. The actual damage it did was negligible.

The work on the preparation for the Platform's liftoff went on. When the allclear signal sounded inside the Shed, nobody paid any attention.

They were busy.

13

ON THE day of the liftoff there was a number of curious side effects from the completion of the Space Platform. There was a very small country on the other side of the world which desperately gambled its existence on the success of the Platform's flight. It had a very powerful and very truculent neighbor. If the Platform got aloft, it could defy that neighbor. And in a grim gamble, it did.

There was also a last ditch fight in the United Nations, wherein the Platform was denounced and a certain block of associated nations threatened to bolt the international organization if the Platform went aloft. And there had to be a gamble. If the Platform didn'r get out to space, the United Nations would either become a military alliance or something less than a futile debating society. Of course there were less important sidelights. There were already fourteen popular-type songs ready for broadcast, orchestrated and rehearsed and with singers ready to saturate the ears of the listening public with them. They ranged from, *"We've Got a Warship in the Sky,"* Which was definitely jingoistic, to a boy-and-girl melody entitled, *"We'll Have a Moon Just For Us Two."* The tune of the second had been stolen from a hit tune of four years before, which hi turn had been stolen from a hit tune of six earlier, and that had been stolen from a bit of Bach, so it was rgjher pretty if one paid no attention to the words.

And of course there was a super-colossal motion picture epic in color and with musical numbers, changing in its filmcans for simultaneous first run showings in eight different key cities. It was titled *"Toward the Stars,"* and three separate endings had been filmed, of which the one that turned out to be appropriate would be used. One ending had the Platform fail through sabotage and the hero—played by an actor who had interrupted his seventh honeymoon to play the part—splendidly prepared to build it all over again. The second ending closed with the Platform headed for Alpha Centauris, which was hardly the intention of anybody outside of filmdom. The third ending was secret, but it was said that hard-boiled motion picture executives had cried like babies when they saw it in preview.

These, of course, did not seem very important in the Shed. There, work went on at a feverish pace. There was no longer any construction work to be done. In theory, therefore, the members of welders and pipefitters and steel construction unions should have retired gracefully to Bootstrap. Members of building maintainance and rig-

ging and wrecking and other assorte^ unions should have been gathered together in far cities, and screened by security, and then brought to Boptstrap and paid overtime so they could pull up woodblock flooring and unbolt and jack out the proper sections of the Shed's eastern wall.

But there'd have been bloodshed if that had been tried. The man who'd built the Platform were going to see it go up, or else. They'd never have a second chance to see it. It would either work or crash.
So the Platform was made ready for its takeoff by the men who'd made it. A gigantic section—three full gores —of the Shed's wall was unbolted in two places and thrust outward at the top and bottom so they were offset from the rest of the huge halfglobe. They rested on hundreds of wheels which for the first tune touched the sixteen lines of rails laid around the outside of the Shed. And then the monstrous section was rolled around and away. A vast opening resulted, and morning sunlight smote for the first tune upon mankind's very first real spacecraft.
Joe saw the sunlight strike, and his first sensation was of disappointment. The normal slope of the Platform was ungainly, but now it was practically hidden by the solid fuel rockets which would consume themselves in their firing. Also, the floor of the Shed looked strange. It was littered with the clumsy shapes of pushpots, trucked to this place in an unending stream all night long. A very young lieutenant from the pushpot airfield hunted up Joe to assure him that every drop of fuel in every pushpot's tanks had been tested twice, once in the storage tanks and again in its final position in the pushpots. Joe thanked him very politely.
There was no longer any scaffolding. There were no trucks left. There were only two gigantic cranes which could handle the pushpots like so many toys. And the effect of sunlight streaming into the Shed and upon such changes was strange.
Outside, carpenters hammered professionally upon a hasty grandstand of timbers. Most of the carpenters would have been handier wtih rivet guns or welding
torches, but nobody commented. As a plank or timber was spiked in place, somebody wound it with very tawdry bunting. Men were stringing wires to the grandstand, and other men sat up television and movie cameras, and there were security men watching these activities with suspicion. There was a glittering mass of microphones.
Joe was lucky. Or perhaps Sally pulled wires. Anyhow, the two of them had a vantage point for which many other people would have paid extravagant sums. They waited where the circular ramp, between the two skins of the Shed, was broken by the removal of the doorway. They were halfway up the curve at the edge of the great opening, and they could see everything, from the pushpot pilots as they were checked into their contraptions, to the sedate arrival of big brass at the grandstand below. There was a sort of reverberant humming from the Shed, now. It might have been wind blowing across its open section. Joe and Sally saw a grim little knot of security men escorting four civilians *o* a flight of wooden steps that Joe remembered. The civilians went up into the Platform and the wooden stairs were pulled away. There were a few very highly trusted men making final inspections of the Platform's exterior. One was about at the height of Joe and Sally. Other inspectors let themselves down to the floor, but this one did a very human thing. When he'd finished his checkup to the last least detail, he pulled something out of his pocket. It was a tobacco can of black paint. He had a brush. He painted his name on the silvery plates of the Platform, *"C. J. Adams, Jr."* and satisfiedly went down to the ground and walked contentedly away.
The cranes began their task. Each reached down deliberately and picked up a pushpot. They swung those objects to vertical positions and presented them precisely to the Platform's side. They clung there ridiculously. Magnetic grapples, of course. They picked up others. They presented'them the same way. Joe and Sally, at the end of the corridor in the wall, could see the heads of the pilots in their plastic domes.
Music blared from behind the grandstand. The seats were being filled. Naturally, the least imporant person-
ages arrived first. There were women hi costumes to which they had given infinite thought—and nobody looked at them except other women. There was khaki. There were business suits which tended to gather in groups, sliderule men, these, who had done the brain-work on the Platform's design. Then black broadcloth. Politicians, past question. There is nothing less impressive from a height of two hundred feet than a potbellied man hi black broadcloth walking on the ground.
There were military uniforms not of the United States armed forces. They ran heavily to medals, which glittered. / There were more arrivals, and more, and more. The news cameras ground.
The cranes worked methodically. They dipped, and deftly picked up an object shaped like the top half of a

loaf of bread. They swung that thing to the Platform's side. Each tune it clung fast. Many of them clung to the rocket tubes; the same tubes that would presently burn away and vanish. Joe and Sally saw the pushpots hi a new aspect, then, as blunt metal slugs with gaping open mouths which were their airscoops.
The music stopped. Somebody began an oration. There was no audience except the men who had built the Platform, and they were not interested hi fine phrases. But of course this event was broadcast everywhere. Two of the television satellites already hi space made sure that all over the world this sight was seen.
The speaker stopped, and another took his place. Another. One man spoke for less than a minute, and the stands applauded. But the one who followed him made splendid gestures. He talked and talked and talked.
The cranes cleaned up the last of the pushpots. They withdrew. The Platform itself was almost invisible under the clustering, ungainly jetpushers.
The cranes had clanked away but the orator spoke on. Somebody plucked at his arm. He ended abruptly and sat down, wiping his forehead with a huge handkerchief.
There was a roar. A pushpot had started its motor. Another roar. Another. One by one, the multitude of clustering objects added to the dun. The sound became a
sound which was no longer bearable as such. It was a tumult one's ears could not use. It reached a peak and held there. Then, abruptly, all the motors slackened in unison, and then roared more loudly. The group controls within the Platform were being tested. Three—four —five times the tumult faded to the merely unbearable and then grew louder again.
Joe felt Sally plucking at his arm. He turned, and saw a jet plane's underbelly very, very close, and its swept-back wings. It was climbing straight up. Then he saw another jet streaking for the great dome's open door. It moved with incredible velocity. It jerked upward and climbed over the Shed's curve and was gone. But there were others and others and others.
These were the fighters of the jet plane guard. For months on end they'd flown above the Shed, protecting it. Now they were going aloft to relieve the present watchers. They were rising to spread out as an interceptor screen for hundreds of miles in every direetion in case somebody should be so foolish as to try anything more. They would not see the monster hi the Shed again. So in a single line which reached to the horizon, they made this rushing run for the single glimpse which was their right. Joe saw tiny specks, streaking down to queue for this privileged glimpse of the Platform before it rose.
Suddenly they were gone, and Joe felt that tingling sense of pride which never comes of power or splendor or pompous might, but is so certain when the human touch modifies magnificence.
The roaring of the pushpot engines achieved utterly impossible volume. The whole ulterior of the Shed was misty, now, but the morning light shone in.
And the Platform moved.
At first it was a mere stirring. It turned ever so slightly to one side, pivoting on the ways that had supported it. It turned back and to the other side. The vapor thickened. From each jet motor a blast of nearly invisible flame poured down, and the moisture in the earth turned into steam and stray woodblocks into acrid smoke. The Platform turned exactly and precisely back to its original position, and Joe's heart pounded, because he
knew that the turning had been done with gyros, and they had been handled by the pilot gyros for which he was responsible.
Then the Platform moved again. It lifted by niches and swayed forward. It checked, and lurched again, and went staggeringly toward the great opening. Some lower part gouged a furrow in the earthen floor.
The noise increased from the incredible to the inconceivable. It seemed as if all the thunders since tune began had returned to bellow because the Platform moved.
It floated and bumped out of the Shed. It staggered toward the east. Its keel, at this point, was perhaps thrpe feet above the ground, but the pushpots cast up blinding clouds of smoke and nobody could be sure.
There was unscheduled confusion. The smoke and vapor splashed out in every possible direction. Joe saw frantic movement, and realized that the uniforms and the frockcoats were scrambling to escape them. The khaki colored specks which were men seemed to run. The brighter, elaborately dressed dots which were women ran gasping and choking from the smoke. One stout figure toppled, and scrambled up, and scuttled frantically for safety.

But the Platform was in motion now. It was a hundred yards beyond the Shed wall. Two hundred. Three... It gathered speed. A halfmile from the Shed it was definitely clear of the ground. It left a trail of scorched, burnt desert behind.
It moved swiftly, now. Two miles from the Shed it was travelling thirty miles an hour. Three miles, and its velocity had doubled and it was hundreds of feet above the ground. It was still accelerating and still climbing. At four miles and five and six.
It was aloft, climbing with a fine deliberation, with all the hundreds of straining, thrusting, clumsy push-pots clinging to it and pushing it ever ahead and upward.
It went on away to the east. It continued to gain speed. It did not seem to dip toward the Horizon at all. It dwindled from a giant to a spot and then to a little dark speck hi the sky. Eventually even Joe couldn't pretend to himself that he saw it. Even then there was probably a tiny droning noise in the sky, but nobody who had
watched the takeoff from nearby could possibly hear
it.
Then Joe looked at Sally and she at him. And Joe was grinning like an ape with excitement aqd relief and triumph which was at once his own and that of all his dreamings. She hugged him in purest exuberance, babbling that the Space Platform was up, was up, was up ...
* * *
At sundown they were waiting on the porch of the Major's quarters behind the Shed. The Major was there, and Haney and the Chief and Mike and Joe. The Major's whole look had changed, now. He seemed to have shrunk, and he looked more tired than any man should ever be allowed to get. But his job was done, and the reaction was enough to explain everything. He sat in a chair with a glass beside him, and he looked as if nothing on Earth would make him move a finger. But nevertheless he was waiting.
Sally came out with a tray. She gravely passed around the glasses and the cakes that went with them. Then she sat down on the steps beside Joe. She looked at him and nodded in friendly fashion. Joe was inordinately approving of Sally, but he felt awkward hi showing it too plainly hi her father's presence.
Mike said defiantly, "But still it woulda been easier to get it up there if it'd been built for guys like me!"
Nobody contradicted him. He was right. Anyhow, every one of them felt too much relaxed and relieved to enter into argument.
"Everything broke right," Haney said dreamily. "Everything! They got in the jet stream like they expected, and it gave 'em three hundred miles extra speed. They were eight miles up when the pushpots fired then" jatos, and twelve miles up when the pushpot pilots let go. They musta near broke their pilots' necks when they caughtj their motors again! And the Platform's rockets fired just right, makin' flames a mile long—and they were going then— What were they going then?"
"Who cares?" asked the Chief peacefully. "Plenty!
"They had ten per cent of their rockets unfired whe:
they got into orbit," said Mike authoritatively. "When they went through the Van Alien belts their sheathing protected the lot of them, jammed into that special cubbyhole. And they settled into orbit."
"They'll come in sight presently," said the Chief.
Joe and Sally sat watching the west. The Space Platform went around the Earth from west to east, like the old moon, and because of its speed it would do so visibly.
Major Holt spoke suddenly. The austerity had gone out of his manner with his energy.
"You four—you gave me the worst scare I've ever had in my life! But do you realize that the sabotage trick with the two truck-loads of explosive, would have smashed the Platform if it hadn't been for that crazy trick you four planned, and the precautions we took because of it?"
Joe said deprecatingly, "We had luck. Extra good luck."
"There are people called accident prones." The Major said. "Accidents happen all around them, and

nobody knows why. You four—perhaps Joe especially—are not accident prones. You seem to be nonaccident prones. I would hesitate to credit your usefulness to your brains. Especially Joe's brains. I have known him too long. But
—ah—Washington does not look at it in exactly the same way."
Sally touched Joe warningly. But her face was very bright and proud. Joe felt queer.
"Joe," said the Major tiredly, "was an alternate for membership in the Platform's crew. But for penicillin or something of the sort, it made a sick man get well quickly, he'd be up there in the Platform's orbit now. His
—ah—cooperation with higher authorities produced very favorable comments and all four of you were—ah
—very useful in the last stages of the Platform's completion. So it is felt that he should have some recognition. All of you, of course, but especially Joe."
Joe felt himself going white.
"It has been proposed—but remember that I say proposed! It is not official. It has been proposed to offer J©e an appointment as skipper of a ferry rocket, carrying supplies and crew reliefs to the Platform. In the instructions he took as an alternate, he showed up unusually well. And there is the matter of being the—ah—exact opposite of an accident prone. The ferry rockets will carry a crew of four, including the skipper. The skipper's recommendations for membership in his crew will nat-| urally have considerable weight."
Joe was struck dumb. Mike said in a fierce, strained I voice; "Joe! I can do anything a big elephant of a guy can>| do, and I only use a quarter of the grub and air! You've] got to take me, Joe! You've got to!"
The Chief said benignly, "I'm in charge of the engine-1 room, and Haney'll be bos'n—let Joe try to think of] takin' off without us!—and that don't leave you a rating,] Mike, unless you're willing to be just plain crew!"
"That's not official!" Major Holt said warningly. "It'sl not certain!"
Then Sally turned her face away from Joe. She looked| up.
* They saw it. A telescope, perhaps, would have shown! it as the thing they'd worked on and fought for. But it| didn't look just like that to the naked eye. It was just tiny speck of incandescence moving with grave deliberation across the sky. It was a sliver of sunlight, movin| as they watched.
There were a good many millions of people watching it, just then. It floated aloft in emptiness. To some people it meant peace and hope and confidence of a serene old age and a life worth living for their children, and theiij children's children; to some it was a fascinating tect nical achievement. To a few it meant that wars had endec and turmoil was no longer to be the norm of life on earthj and those things meant disaster to those few. But il meant something to everybody in the world. To the pec pie who'd been unable to do anything for it but prajj for it, perhaps it meant most of all.
Joe said quietly, his voice surprisingly returned him.
"We'll be going up there to visit it. All of us."
He realized that Sally's hand was tightly clasped in his She said, "Me, too, Joe?"
"You too."
Joe stood up to watch more closely. Sally stood beside him. The others moved to look. They made a group on the lawn, as people were grouped everywhere in all the world to look up at it.
The Space Platform, a tiny sliver of sunshine, moved sedately across the deepening blue toward the east. Toward the night.
The End.