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Gunner Cade BY CYRIL JUDD

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SERIAL

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SOCIAL PATTERN

A standard theme in science fiction is the concept of the contact between human beings and an alien race having a different cultural pattern. This editorial, gentlemen, is an invitation for help. Probably some of you who read this are symbolic logicians; all of us are theoretically versed in the formulae of our Western Christian Cultural Pattern, and all of us are, theoretically, capable of logic.

The proposition is as follows: Suppose the Aliens do arrive, display friendly, sincere, and intelligent interest, and a genuine desire for mutual improvement of understanding of the universe. First, naturally, the barriers of language and cultural beliefs must be understood, and contact established on a real-communication basis.

Now any given word is a symbol, and has relevance only in context. A large part of that context is the social-cultural matrix; for a really total-alien, it would be as necessary to learn the rules of the culture as to learn the rules of the language. So, in an effort to establish true communication, we must lay before the visitors the rules of grammar, the rules of pronunciation, and the rules of the cultural matrix.

The rules of grammar in English are somewhat arbitrary, but have been formulated long since, and are readily available. The rules of pronunciation in English are so exceedingly arbitrary, and so poorly related to the rules of spelling, that I would recommend that the first contact be established in a language such as Spanish, which has a relatively sane degree of correlation between spelling and pronunciation.

Then we come to the rules of Society and Culture. These, to the best of my knowledge and belief, have never been derived and set down as a system of postulates. Naturally, a culture must derive from some system of postulates concerning the nature of the Socio-cultural Contract. The obvious way to attack the problem would be to analyze the system of society, and derive from it the postulates on which it is based. With the powerful tool of symbolic logic this should be relatively

simple . . .

Only it isn't. Logic, symbolic or otherwise, will work only on a system of self-consistent statements; the best logic can do when applied to a non-self-consistent pattern is to keep signaling frantically "Illogical! Illogical! Not subject to logical analysis!"

I find it is a perfectly fascinating business to attempt to derive the patterns of our culture, and determine the basic postulates behind it!

For example: Pride is a deadly sin. But pride is a sense of strong respect for one's self and one's own accomplishments. Social Postulate No. 114-B holds that Pride is Indecent. But Social Postulate No. 79-A holds that Lack of Self-respect is Indecent.

The Expressed Code of Society, as defined by those factors permissible in "Polite Conversation," and expressible in movies, radio and newspapers, differs violently from the Reality Code of Society. The Expressed Code holds possessiveness and pride of possession to be improper, something to be scorned. The Reality Code holds that an individual who does not have pride of possession, and covetousness enough to get possessions, is an object of scorn.

It would be exceedingly interesting, I think, to set up a specifically, definitely stated system of postulates on which the Social Code rests. So far as I can determine, the task is logically impossible, since only by full acceptance of what George Orwell, in "Nineteen Eighty-four," called "doublethink" can such a feat be achieved. It requires that the individual simultaneously believe and accept two mutually exclusive postulates.

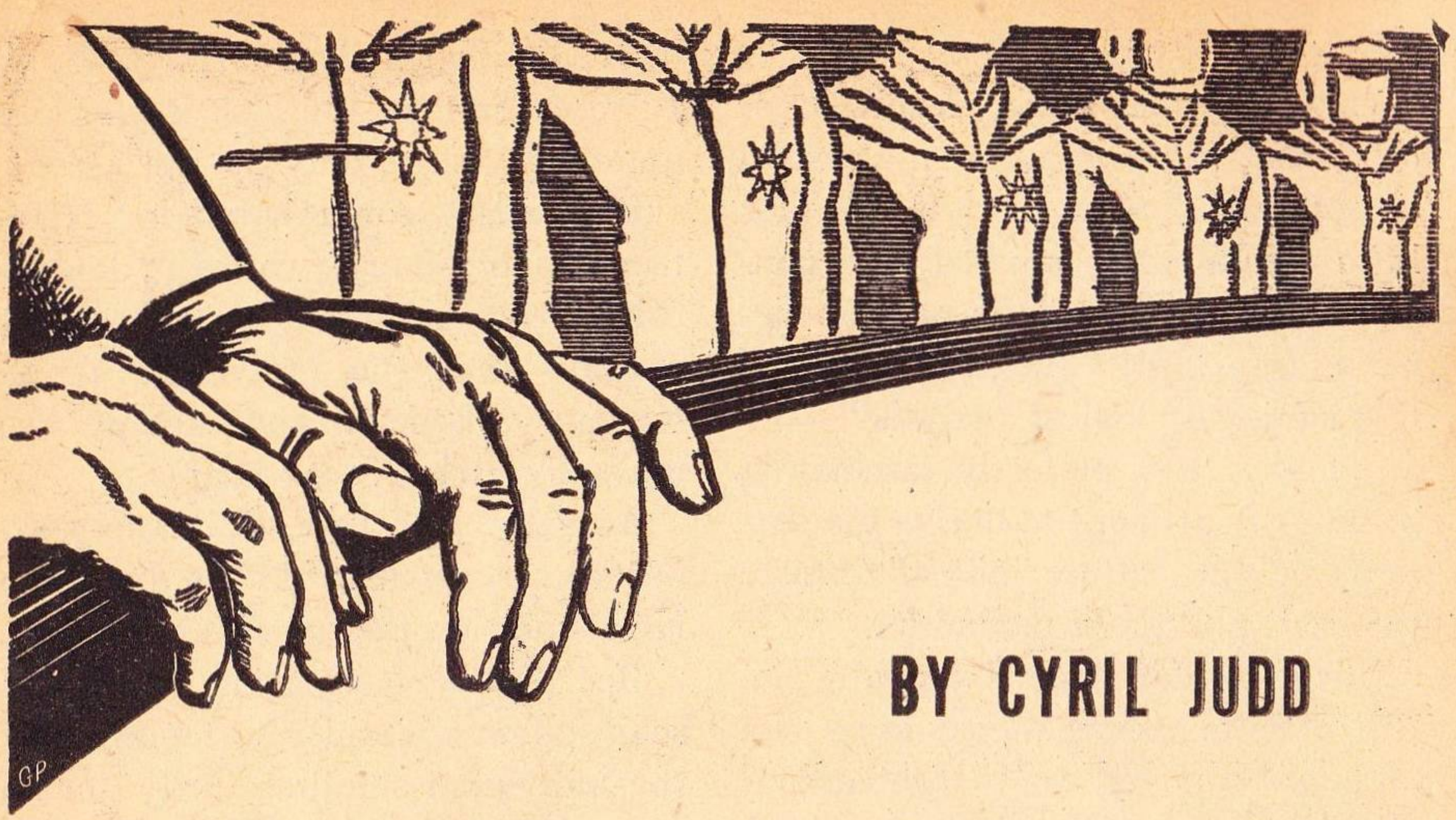
Actually, of course, the society expects every man to do his duty—do NOT question the rules; it's indecent.

But it's a fascinating source of schizophrenic insanity to require that the individual simultaneously act on mutually exclusive ideals. No one can be perfectly adjusted to a system of society that is not adjusted to its own rules, and is not adjusted to the physical reality of the beings composing it.

But, for the fun of it, be a robot engineer faced with the problem of inculcating a robot having infinite memory, great analytical ability, and capable of perfect logic and computation with the rules Society. Asimov's Three Laws of Robotics are fun, but inadequate; draw up a complete system of postulates such that a logical, thinking robot could be a well-adjusted member of our society.

After all, we all know the familiar code of society; anybody ought to be able to do that little thing . . .

THE EDITOR.



BY CYRIL JUDD

GUNNER CADE

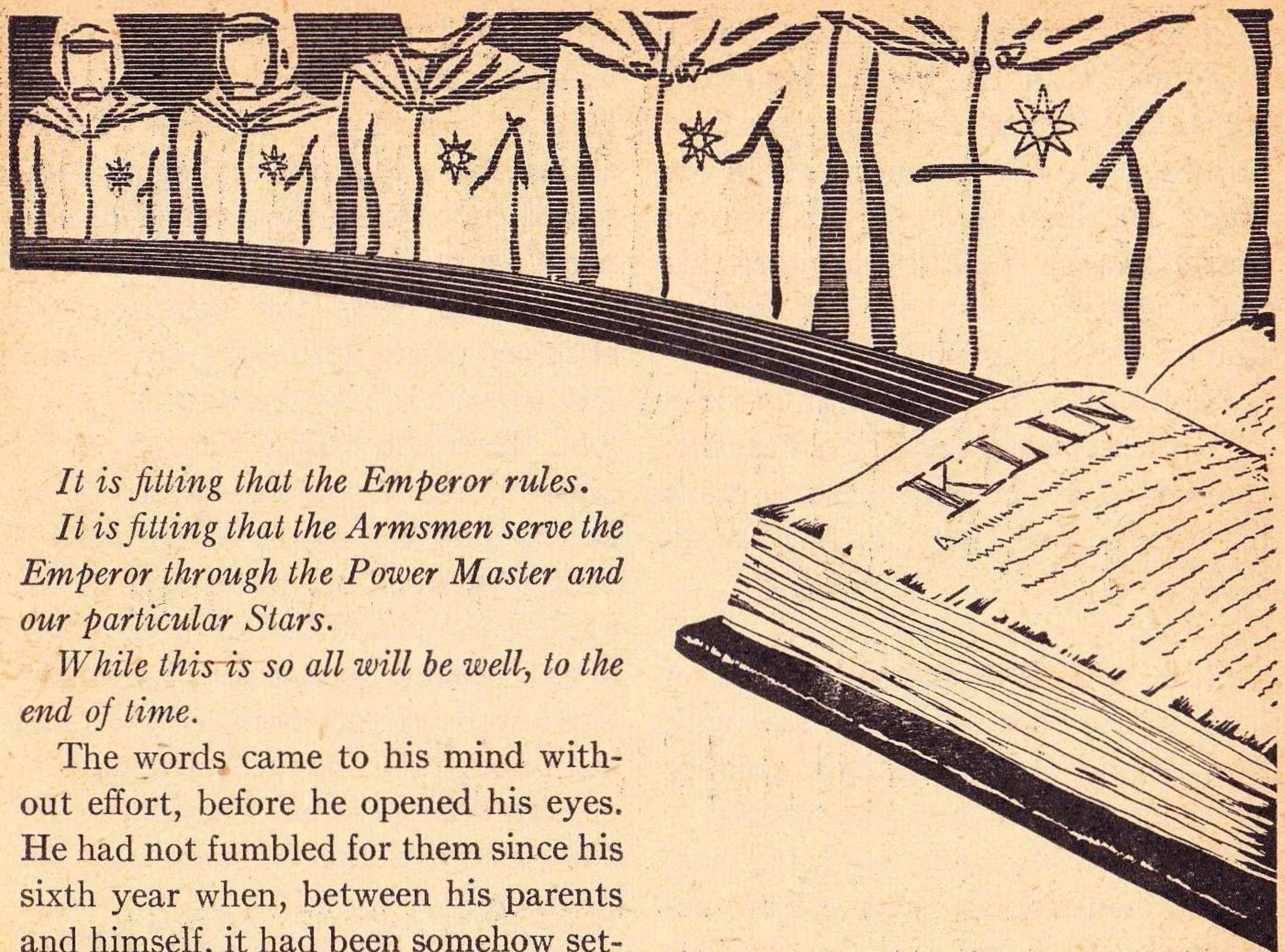
First of three parts. *Gunner Cade had intelligence, loyalty, an immense technical skill in combat—and a philosophy. But never in his life had he been required to think—and he did his thinking only under the most violent pressure!*

Illustrated by Pawelka

I.

Far below the sleeping loft, in ancient cellars of reinforced concrete, a relay closed in perfect silent automaton adjustment; up through the Chapter House, the tiny noises multiplied and increased. The soft whir of machinery in the walls; the gurgle of condensing fluid in conditioners; the thumping of cookers where giant ladles stirred the breakfast mash; the beat of pistons pumping water to the top.

Gunner Cade, consecrate Brother in the Order of Armsmen, compliant student of the Klin Philosophy, and loyal citizen of the Realm of Man, stirred in his sleepbag on the scrubbed plastic floor. He half-heard the rising sounds of the machinery of the House, and recognized the almost imperceptible change in the rhythm of the air blowers. Not quite awake, he listened for the final sound of morning, the scraping noise of the bars at windows and gates, as they drew back reluctantly into the stone walls.



It is fitting that the Emperor rules.

It is fitting that the Armsmen serve the Emperor through the Power Master and our particular Stars.

While this is so all will be well, to the end of time.

The words came to his mind without effort, before he opened his eyes. He had not fumbled for them since his sixth year when, between his parents and himself, it had been somehow settled that he would become a Brother of the Order. For at least the six-thousandth time, his day began with the conscious affirmation of Klin.

The bars grated in their grooves, and at the instant, the first light struck through the slits of windows overhead. Cade shivered inside the scanty insulation of his bag and came fully awake, at once aware of the meaning of the chill. This was a Battle Morn.

The air blew steadily stronger and colder from the conditioners, tingling against his skin as Cade slipped from his sleepbag and folded it, deflated, into the precise small package that would fit the pocket of his cloak. Timing each action by the habits of thirteen years, he unbuckled his gun belt, removed the gun, and closed away the belt and sleepbag in the locker that held his neatly folded uniform. It was by now reflexive action to open the gun and check the charge, then close the waterproof seal.

Battle Morn! With mounting elation, Cade performed each meticulous detail of the morning routine, his body operating like the smooth machine it was, while his mind woke gradually to the new day. He thought vaguely of Commoners lolling late in bed, mumbling a morning thought of the Emperor and breaking their fast

at a grossly-laden table. He thought vaguely of Klin Teachers waking with subtle and elaborate propositions that proved what any Gunner feels in his bones. He thought vaguely of his own Star of France, doubtless haggard this morning after a night vigil of meditation on the fitting course.

He thought, too, of the Emperor—the Given Healer; the Given Teacher; the Given Ruler—but, like a gun's blast came the thought: *this is not fitting*.

Guiltily Cade brought his attention back to the bare room, and saw with dismay that Gunner Harrow still lay in his bag, yawning and stretching.

His indecent gaping was infectious; Cade's mouth opened first with amazement, then to say sharply: "Battle Morn, Brother!"

"How does it find you?" Harrow replied.

What kind of Chapter House did they have on Mars?

"Awake," Cade answered coolly, "and ready for a good death if that is fitting—or a *decorous* life if I am spared today."

The Marsman seemed to miss the reprimand entirely but he climbed out of his bag, and began to deflate it.

"How long till shower?" he asked.

"Seconds," was Cade's contemptuous answer. "Perhaps twenty or thirty."

The Marsman sprang to life with a speed that would have done him credit under other circumstances. Cade watched with disgust as the other Gunner rushed for the wall cabinet and stuffed away his sleepbag, still unfolded, not yet fully drained of last night's air. The gun belt was thrown in on top, and the cabinet door slammed shut, with only an instant left to seal the waterclosures of the gun. Then the ceiling vents opened, and the needle spray showered down and around the room. A cool invigorating stream of water splattered against the naked bodies of the men, swept around to cascade down the three walls of the room, and drained out through the floor vent, leaving just enough dampness for the scouring by Novices when the Gunners had left the room.

Cade took his eyes from the Marsman, and tried to tear away his thoughts as well. He watched devoutly while the water struck each wall in turn, touching his gun to his lips: *For the Teacher*, at the first impact; to his chest, *For the Healer*, at the next; and at the last, the long wall to his brow, with awe, *For the Ruler, the Emperor*.

He tried not to think of Harrow in the room beside him, saluting the cleansing waters with an unchecked charge in his gun. It was true then, what they said about conditions on Mars. Laxity at any time was bad enough, but to let the peril of sloth pass from the previous day through the purifying waters of a Battle Morn

was more than Cade could understand. A Novice might meet the shower unprepared; an Armiger might fail to check his charge beforehand; but how did Harrow ever rise to the rank of Gunner? And why was such a one sent to Cade on the eve of battle? Even now, his own Battle Morn meditations were disturbed.

Anger is a peril at all times. And anger is acutely unfitting on Battle Morn before the Klin Teacher's lesson. Cade refused to think of it further. The water vents closed and he dressed without regard for the Marsman.

Each garment had its thought, soothing and enfolding: they brought peace.

Undersuit: *Like this the Order embraces the Realm.*

Shirt: *The Order protects the Power Master, slave of the brain, loyal heart of the Realm.*

Hose: *Armsmen are sturdy pillars; without them the Realm cannot stand, but without the Realm the Order cannot live.*

Boots: *Armsmen march where the Emperor wills; that is their glory.*

Helmet: *The Order protects the Emperor—the Given Teacher, the Given Healer, the Given Ruler—the brain and life of the Realm.*

Cloak: *Like this the Order wraps the Realm and shields it.*

Again he touched his gun: to his lips, *for the Teacher;* to his chest, *for the Healer;* to his brow, with awe, *for the Ruler, the Emperor.*

Briskly he released the waterclosures and dropped his gun into the belt on his hip. A gong sounded in the wall and Cade went to a cabinet for two steaming bowls of concentrate, freshly prepared in the mash cookers far below.

"Brother?" said Harrow, as they settled cross-legged on the floor to eat.

Silence at this time was customary but not mandatory, Cade reminded himself—and Harrow was new to this Chapter.

"Yes, Brother," he said.

"Are there other Marsmen among us?"

"I know no others," Cade said shortly. "How would it concern you?"

"It would please me," Harrow said formally. "A man likes to be among his own people in time of battle."

Cade could not answer him at first. What sort of talk was this? One didn't call himself "a man" in the Order. There were Novices, Armigers, Gunners, the Gunners Superior and the wonderful old Arle who was Gunner Supreme. They were your Brothers, elder or younger.

"You are among your own people," he said gently, refusing to let himself be led into the peril of anger. "We are all your Brothers."

"But I am new among you," the other said. "My Brothers here are strangers to me."

That was more reasonable. Cade could still remember his first battle for

the Star of France, after he left the Denver Chapter where he spent his youth. "Your Brothers will soon be beside you in battle," he reminded the newcomer. "An Armsman who has fought by your side is no stranger."

"That will be tomorrow," Harrow smiled. "And if I live through today, I shall not be here long after."

"Where, then?"

"Back to Mars!"

"How can that be?" Cade demanded. "Mars-born Gunners fight for Earthy Stars. Earth-born Gunners fight for the Star of Mars. That's fitting."

"Perhaps so, Brother; perhaps so. But a letter from my father at home says our Star has petitioned the Emperor to allow him all Mars-born Armsmen, and I would be one of them."

"Your Star is the Star of France," said Cade sharply. He himself had received Harrow's assignment yesterday, sealed by the Power Master, and counter-sealed by the Gunner Supreme. He was silent a moment, then could contain himself no longer. "By all that's fitting," he asked, "what sort of talk *is* it? Why does an Armsman speak of himself as a . . . a *man?* And how can you think of 'your own people' other than your Brothers in arms?"

The Mars-born Gunner hesitated. "It's newer on Mars. Six hundred years isn't a long time. We have a proverb: 'Earth is changeless but Mars is young.' And families—I am descended from Erik Hogness and Mary Lara, who mapped the northern hemisphere long ago. I know my cousins because of that. Do *you* know anything about your eight-times-great grandfather or what he may have done?"

"I presume," said Cade stiffly, "that he did what was fitting to his station as I will do what is fitting to mine."

"Exactly," said Harrow, and fell silent—disconcertingly resembling a man who had wrung an admission from an opponent and won an argument by it.

Cade went stiffly to the door and opened it, leaving the empty bowls for Harrow to return. The line of Armsmen came in sight down the corridor and they waited at attention to take their place among the Gunners, marching in silence and with downcast eyes along the route of procession to the lectory.

Seated on the front row of benches with twenty rows apiece of Armigers and Novices behind, Cade was grateful that the Klin Teacher had not yet arrived. It left time for him to dispel the perilous mood of irritation and suspicion. By the time the man did appear, he was properly calm.

It was fitting to be a Gunner; it was fitting to be a Klin Teacher; they were almost brothers in their dedication. The glow almost vanished when the

man began to speak.

Cade had heard many Teachers who'd been worse; it made not a particle of difference in the Klin Philosophy whether it was expounded by a subtle, able Teacher or a half-trained younger son of a Star, as this fellow appeared to be; what was fitting was fitting and would be until the end of time. But on a Battle Morn, Cade thought, a senior teacher might have been a reasonable tribute. *The peril of pride*, came a thought like a gun's blast, and he recoiled. In contrition he listened carefully, marking the youngster's words.

"Since the creation of the worlds ten thousand years ago the Order of Armsmen has existed and served the Emperor through the Power Master and the particular Stars. Klin says of armed men: 'They must be poor, because riches make men fear to lose them and fear is unfitting in an Armsman. They must be chaste because love of woman makes men love their rulers—the word *rulers* here means, as always, Klin, the Emperor—less. They must be obedient because the consequence of disobedience is to make men refuse even the most gloriously profitable death.' These are the words of Klin, set down ten thousand years ago at the creation of the worlds."

It was wonderful, thought Cade, wonderful how it all had occurred together: the creation of the worlds, the Emperor to rule them, the Order to serve him and the Klin Philosophy to teach them how to serve. The fitness and beautiful economy of it never failed to awe him. He wondered if this creation was somehow THE Fitness, the original of which all others were reflections.

The Teacher leaned forward, speaking directly to those in the front row. "You Gunners are envied, but you do not envy. Klin says of you Gunners: 'They must be always occupied with fiddling details'—I should perhaps explain that a *fiddle* was a musical instrument; *fiddling* hence means *harmonious*, or *proper*. Another possibility is that *fiddling* is an error for *fitting*, but our earliest copies fail to bear this out —'with fiddling details so they will have no time to think. Let armed men think and the fat's in the fire.'"

Good old Klin! thought Cade affectionately. He liked the occasional earthy metaphors met with in the "Reflections on Government." Stars and their courts sometimes diverted themselves for a day or two by playing at Commoners' life; the same playfulness appeared in Klin when he took an image from the kitchen or the factory. The Teacher was explaining the way Klin's usage of *think* as applied to anybody below the rank of a Star was equated with the peril of pride, and how the homely kitchen-metaphor meant nothing less than universal ruin. "For Klin, as usual, softens the blow."

Irresistibly Cade's thoughts wandered to a subject he loved. As the

young Teacher earnestly expounded, the Gunner thought of the grandeur of the Klin Philosophy: how copies of the "Reflections" were cherished in all the Chapter Houses of the Order, in all the cities of all the Stars of Earth, on sparsely-settled Venus, the cold moons of the monster outer planets, on three man-made planetoids, and on Mars. *What* could be wrong with Harrow? How *could* he have gone awry with the Klin Philosophy to guide him? Was it possible that the Teachers on Mars failed to explain Klin adequately? Even Commoners on Earth heard Teachers expound the suitable portions of the Philosophy. But Cade was warmly aware that the Armsmen's study of Klin was more profound and pure than the Commoners'.

" . . . So I come to a subject which causes me some pain." Cade brought his mind back sharply to the words of the Teacher. This was the crucial part, the thing he had been waiting to hear. "It is not easy to contemplate willful wickedness, but I must tell you that unfit deeds fill the heart of the Star of Muscovy. Through certain sources our Star of France has learned that pride and greed possess his Brother to the North. With sorrow he discovered that the Star of Muscovy intends to occupy Alsace-Lorraine with his Gunners. With sorrow he ordered your Superior to make ready for whatever countermeasures may be fit, and it has been done. As you know, this is Battle Morn."

Cade's heart thumped with rage at the proud and greedy Star of Muscovy.

"Klin says of such as the Star of Muscovy: 'The wicked you have always with you. Make them your governors.' *Governors* is used metaphorically, in the obsolete sense of a device to regulate the speed of a heat engine —hence, the passage means that when a wicked person is bent on unfit deeds, you should increase your efforts towards fit and glorious deeds to counter him. There are many interesting images in the *Reflections* drawn from the world of pre-electronic—but that is by the way. I was saying that this is Battle Morn, and that before the sun has set many of you may have died. So I say to all of you, not knowing which will have the fortune: go on your fitting and glorious task without the peril of pride, and remember that there is nobody in the Realm of Man who would not eagerly change places with you."

The Teacher stepped down and Cade bowed his head for the thought: *The Klin Philosophy in a Gunner is like the charge in his gun.* It was a favorite of his, saying so much in so little if you had only a moment, but if you had more time it went on and on, drawing beautifully precise parallels for every circuit and element of the gun. But there was no time for that; the Superior, the Gunner Superior to the Star of France, had appeared. He cast a worried little glance at a window,

through which the sun could be seen, and began at once:

"Brothers, our intelligence is that one hundred Gunners, more or less, are now flying from an unknown Muscovite base to occupy the Forbach-Sarralbe triangle on the border of our Star's realm. Time of arrival—I can only say 'this afternoon or evening' and hope I am correct. The importance of the area is incalculable. It was a top secret until the information evidently got to Muscovy. *There is iron ore in the district.*"

A murmur swept the lectory, and Cade murmured with the rest in astonishment. Iron ore on Earth! Power metal still to be found on the ten-thousand-year-old planet after ten thousand years of mining for the stuff that drove engines and charged guns! All reserves were supposed to have been exhausted four hundred years ago; that was why rust-red Mars had been colonized, and from rust-red Mars for four hundred years had come Earth's iron.

"Enough, Brothers! Enough! Our plan will be roughly the same as that employed in our raid last month on Aachen—two divisions to the front, one in reserve. The first company under me will be based at Dieuze, about forty kilometers south of the triangle. The second company under Gunner Cade will be based at Metz, fifty kilometers west of the triangle. The third company will be in reserve, based at Nancy, seventy kilometers southwest of the triangle. The companies will proceed to their bases in two-man fliers immediately after this briefing.

"After arrival and the establishment of communication, my company and Gunner Cade's will send out air scouts to reconnoiter the triangle. If no enemy action is discovered from the air, scouts will parachute for recon on foot. The orders I will issue from that point on will depend on their reports. Man your fliers and take off at once, Brothers. May your deeds today be fitting and glorious."

II.

Cade, icily calm, ran from the Chapter House two hundred meters to the flying field. He was not panting when he swung himself into his small craft. His fingers flew over the unlabeled switches and dials of the panel. It had been many years since he'd relied on mnemonic jingles to recall the order and setting of the more than two hundred controls. As the red electronic warmup fog misted from the tail of the flier, his passenger, Armiger Kemble, vaulted in and was immediately slammed back against his uncushioned seat by a 3.25-G takeoff.

Paris was a blur beneath them, the Paris that Cade, Denver-born, had seen only from the air and the windows of the Chapter House. Minutes later Reims flashed past to their left. The braking and landing in the square at Metz were as cruel as the take-off.

Cade had never spared himself or anybody else on service, though he did not know that he was famous for it.

"Brother," he said to the battered Armiger, "line up the command set on Dieuze and Nancy." To his disgust Kemble juggled with the map, the compass and the verniers of the aiming circle for two minutes until he had laid beams on the fields at the reserve base and the other frontline command post. *The peril of pride*, he guiltily thought, choking down his annoyance. The twelve other ships of his company had landed by then.

"Brother Cade," said the voice of the Superior. "Scouts out!"

"Scouts out, Brother," he said, and waved two fliers aloft. From them a monotonous drone of "No enemy action" began over the command set.

The tune changed after five minutes: "Rendezvous with first company scouts over Forbach. No enemy action."

"Brother Cade," said the Superior, "order your scouts to jump. My fliers will provide cover."

Cade ordered: "Second company scouts—Gunner Arris, take over Gunner Meynall's flier on slave circuit. Brother Meynall, parachute into Forbach for recon on foot. Armiger Raymond, recon Sarreguemines. Armiger Bonfils, recon Sarralbe."

Brothers Meynall, Raymond and Bonfils reported successful landings. The Gunner in Forbach said: "No Commoners about at all. As usual. I'm in the village square headed for the 'phone exchange. No en—" There was the sound of a gun and no further report.

Cade opened the Raymond-Bonfils circuit to the Superior and reserve company and snapped: "Take cover. Forbach is occupied. Gunner Arris return to base with fliers immediately."

The Superior's voice said: "First company fliers return to base immediately. Brothers Raymond and Bonfils, report!"

Armiger Raymond's voice said: "Sarreguemines is empty of Commoners. I've taken cover in the basement of a bakery whose windows command the square. I see movement at the windows of a building across the square—the town hall, 'phone exchange, water department and I don't know what else. It's just a village."

"Brother Bonfils, report!"

There was no answer.

"Brother Raymond, stand fast. We shall mount an attack. Hold your fire until the enemy is engaged and then select targets of opportunity. You will regard yourself as expendable."

"Yes, Brother."

"Third Company at Nancy, you are alerted. Second Company and Third Company, rendezvous with First Company in ten minutes, at 1036 hours, two kilometers south of the Sarralbe town square. Align your fliers for unloading to fight on foot; we shall conduct a frontal assault on Sarralbe and

clear it of the enemy. The Third Company will be on the left wing, the Second Company will be our center, and the First Company will be in the right wing. Gunner Cade, you will detail one flier to amuse the enemy with a parachute attack on the town hall as our skirmishers reach the square. Into action, Brothers."

"Load!" yelled Cade to his company and they tumbled into their craft. On the slave circuit he took the fliers up in dress-parade style, hurled them to the rendezvous and released the ships for individual landings. The First Company was aligned straight as a string to his right, and moments later the Third Company touched down.

Armiger Kemble had done a most unsatisfactory job lining up the communications, Cade reflected, but it was not fitting in a Gunner to hold a grievance. "Brother," he said, "I've chosen you to conduct the diversion our Superior ordered."

The youngster straightened proudly. "Yes, Brother," he said, repressing a pleased grin.

Cade spoke into his command set: "Gunner Orris. You will remain here in your flier during the attack, with Armiger Kemble as a passenger. On my signal you will take off and fly over the Sarralbe Town Hall, dropping Brother Kemble by parachute to create a diversion. After dropping him, return your flier to its present position and dismount to join the attack on foot."

The Armiger climbed out of Cade's flier to head for Orris' craft, but hesitated on the ground and turned to brag: "I'll bet I get a dozen of them before they get me."

"Well, perhaps, Brother," said Cade, and this time the grin did break out as the Armiger marched down the line. Cade hadn't wanted to discourage him but the only Muscovite gunman he had a chance of killing before he was picked off in midair was their roof spotter. But how could he be expected to understand? Thirty seconds of confusion among the enemy could be vastly more important than killing thirty of their best Gunners.

The clock said 1036; men boiled out of the fliers and formed a skirmish line carefully ragged. The raised right arm of the Superior, far on the right of the line, went down and the Brothers began to trudge forward, all with the same solid, deliberate stride . . .

Cade's eyes were everywhere; they were scanning bushes for untoward movements, the ground for new dirt cast up in the digging of a foxhole, trees for unnatural man-sized clumps of foliage among the branches. But somehow he felt his feet in his boots, not painfully but happily. *Gunners march where the Emperor wills; that is their glory.*

Off to the right a gun blasted. The Superior's voice said in his helmet: "Enemy observation post, one Novice. We got him but now they're

alerted in town."

He told the men flanking him: "Enemy O.P. spotted us. Pass the word, Brothers." It murmured down the line. Brothers who had absently let themselves drift into a dress-parade rank noticed it and lagged or heel-and-toed until the line was properly irregular again.

It was done none too soon. Some thirty meters to the left of Cade the excellently-camouflaged lid of a firing pit flipped up as the line passed. The Muscovite blasted two Armigers with a single shot before he was killed. Defilading fire into a straight rank would have netted him twenty. The wood grew thicker and direct flank contact was lost. "Scouts out," said the Superior's voice, and Cade waved two Gunners forward.

Their eloquent arms were the eyes of the Company. One upraised and the Company saw possible danger; it halted. The upraised arm down and forward and the Company saw safety; it trudged on. Both arms moved forward in a gesture like clasping a great bundle of straw and the Company was alarmed by something inexplainable; it inched forward with guns drawn, faces tingling. Both arms beating down like vultures' wings and the Company was face-to-face with grinning death; it hurled its fifty bodies to the ground to dodge the whistling scythe.

Grinding himself into the ground while his eyes methodically scanned before him for the well-concealed Muscovite combat patrol, Cade thought: *It is fitting that we Gunmen serve.* He saw the unnatural movement of a bush and incinerated it. In the heart of the blaze was a black thing that capered and gibbered like a large ape—one more of the enemy charred to nonexistence. His blast had given away his position; automatically he snap-rolled two meters and saw flame blaze from a tree's lower branches to the spot he'd fired from. Before the blast from the tree expired he had answered it.

He thought: *While this is so, all will be well to the end of time.*

The surviving scout's arm went up with an air of finality. The company halted and the scout trotted back to Cade. "Ten meters of scrub and underbrush and then the town. Three rows of four-story stone houses and then the square, as I recall. The underbrush is clear. But those windows looking down on it—!"

"Plunging fire," Cade muttered, and he heard a sharp intake of breath from beside him. He turned to look sternly on the young Armiger with the stricken face, but before he could reprove the lad, he heard Harrow, the Marsman, intervene.

"I hate it, too," the Gunner said, and the unexpected note of sympathy broke the youngster completely.

"I can't stand it," he babbled, hysterically. "That feeling you get when it's coming at you from above and all the ground cover in the world

won't help—all you can do is run! I can't stand it!"

"Quiet him," Cade said with disgust, and someone led the Armiger away, but not before Cade noted his name. He would deal with it later.

"Brother," Harrow spoke in his ear, earnestly.

"What is it?" Cade snapped.

"Brother, I have an idea." He hesitated, but as Cade turned impatiently away, he rushed on: "Brother, let's give them plunging fire. No one would have to know."

"What are you talking about?" Cade asked blankly. "There aren't any trees high enough or near enough."

The Marsman said wildly: "Cade, don't pretend to me. I can't be the only Gunner who ever thought of it! Who's going to know the difference? I mean—" His throat sealed; he couldn't get the words out.

"I'm glad to see you have some shame left," Cade said disgustedly. "I *know* what you mean." He turned aside and called out: "Bring back the coward Armiger!" As soon as the youngster was with them, he said: "I want you to learn for yourself the consequences of submitting to the peril of fear. Your outburst made *Gunner* Harrow propose that we . . . we fire on the houses from our *fliers*."

The Armiger looked down at his feet for a long moment and then faced his

commander. He said hoarsely, "I didn't know there were people like that, sir. Sir, I should like to request the honor of being permitted to draw fire for our men."

"You have earned no honors," Cade snapped. "Nor does your rank entitle you to privileged requests." He looked meaningfully at the Mars-born Gunner.

Harrow wiped sweat from his face. "I would have got back to Mars," he said, "back with my own people if I'd lived through this one."

"You deserve less than this *Gunner* Harrow," Cade pronounced sternly into a sudden listening silence. The firing was momentarily stilled; the enemy was awaiting their action. All the Armsmen of France within hearing distance of the episode had edged closer to be in on the final outcome. Cade seized the moment to impress an unforgettable lesson on his men. He said loudly:

"Klin wrote: 'Always assume mankind is essentially merciful; nothing else explains why crooks are regularly returned to office.' If you know as little of the Philosophy as you do of decency, Brother, I should explain that a *crook* is an implement formerly used by good shepherds and in this case stands, by a figure of speech, for the good shepherd himself. I shall obey Klin's precept of mercy. We need a Gunner to draw fire from the house windows so we can spot those which are—Are you listening to me?"

The Mars-born Gunner was mumbling to himself; he looked up and said clearly, "Yes, Brother, I'm listening."

But his lips kept moving as Cade went on: "We have to draw fire from the house windows so we can see which are manned, blast them with a volley and take the house in a rush."

"Yes, Brother, I'll draw their fire," said Harrow.

Cade wheeled suddenly, and confronted the rest of his company. "Are you Armsmen," he demanded fiercely, "or Commoner kitchen gossips? Back to your posts before the enemy discovers your weakness! And may the fighting scourge your minds of this memory. Such things are better forgotten."

He called the first and third companies on his helmet 'phone and filled them in—saying nothing of the disgraceful episode.

"Well done," the Superior told him. "Rush the first row of houses immediately; we have your co-ordinates and will follow behind after you have secured a house or two."

Harrow's muttering had started again and become loud enough during the conversation to be a nuisance. He was repeating to himself:

"It is fitting that the Emperor rules.

"It is fitting that the Power Master serves him.

"It is fitting that we Gunnien serve the Emperor through the Power Master and our particular Stars.

"While this is so, all will be well until the end of time."

Cade could not very well rebuke him.

Harrow distinguished himself in drawing fire from the house windows. In such an operation there is the risk that—well, call him the "target"—the target will walk out in a state of exaltation, thinking more of the supreme service he is rendering than about the actual job of rendering it. Cade was pleased and surprised at the desperate speed with which Harrow broke from the end of the wood and sped through the brush, his cloak flaring out behind him, proudly displaying the two Gunner's stripes at the hem: a new brown one for France; an old red one below for Mars.

A bolt from one window missed him.

"Mark," snapped the first in a row of picked shots.

A bolt from another window blasted Harrow's left arm, but he kept running and even began to dodge.

"Mark," said the second of the sharpshooters.

A third window spat fire at the dodging Gunner and hit the same burned arm.

"Mark."

Another bolt from another window smashed his legs from under him.

"Mark."

There was a little surge forward in the line of waiting Stormers. Cade threw his arm up, hard and fast. "He's crawling," he said. "They'll finish him off."

From a small and innocent-looking stairwell window fire jetted.

"Mark."

"He's done," said Cade. "*While this is so all will be well* . . . Marksmen ready; Stormers ready. Marksmen, fire. Stormers, charge." He led the way, crashing through the brush, with a torrent of flame gushing over his head: his Marksmen, with the initiative of fire, pinning down the Muscovites at their windows—almost all of them. From two unsuspected windows fire blazed, chopping down two of the storming party. They were met with immediate counterfire from waiting Marksmen in the woods. And by then there were ten Gunners in the dead ground against the house wall. With Cade in the lead, the Armsmen of France swarmed down a narrow alley that separated house from house and blasted down a side door.

Like coursing hounds they flowed through the house, burning down five Muscovite Armsmen already wounded by the neutralizing fire from the woods, finding two others dead at their windows. They lost one Armiger of France, to the desperate dying fire of a wounded Muscovite. The house was theirs.

The rest of the company, except for a pair of guards, trudged across the brush and entered.

Cade stationed men at the vital upper windows and sat, panting, on the floor of a bare second-story room. All the rooms were more or less bare.

It was probably so through all three villages. He had seen Commoners migrating.

Clots of them, oozing slowly along the roads. Their chief people in ground cars, cursing at the foot-sloggers who wouldn't get aside. The carts, piled high with household goods—the snivveling, shrieking children. And yet—And yet—there was a puzzle in it. Not always, but almost always, they knew in advance. The Muscovites, in possession of the great secret of the iron ore, had arrived to find that at least part of the secret was known to the lowliest Commoner—enough at least to send him out on the road.

They were into the afternoon now, with nothing to do but wait for the First and Third companies. This would last a week, easily—three villages to clear. Perhaps the feint at the city hall—if it came off today—would crumple the Muscovites. And when they go to Sarreguemines there would be Brother Raymond lying doggo in the cellar—

He sat up with a guilty start. Nobody had checked the cellar in this very house, if it had one, probably because cellars didn't have windows. He got wearily to his feet and limped downstairs to the first floor. There seemed to be no further steps down—and then he saw a gap between the wall and an immense cherry-wood cabinet bare of its dishes and mementoes. It creaked open when he tried it and there were his cellar steps with a guttering light at the bottom.

An old, old face, brown and wrinkled and ugly, was peering at him by the flickering light.

"Come up, Commoner," he said. "I wish to look at you."

"No, sir," the wrinkled face squeaked in the voice of a woman. "No, sir, I cannot, sir, to my shame. My daughter, the lazy slut, put me and my dear brother down here when the armed men were about to come, for she said she and her great fat husband couldn't be bothered with us. I cannot come up, sir, because my legs won't go, to my shame."

"Then send up your brother, Commoner."

"No, sir," the hag squeaked. "My dear brother cannot come up, to my shame. My lazy slut of a daughter and her great fat husband did not leave the right food for him—he suffers from the wasting sickness and he must have the livers of animals every day—and so he died. Are you an armed man, sir?"

"I am a Gunner of the Order of Armsmen, Commoner. Did you say you had food down there?" Cade suddenly realized he was ravenous.

"I did, sir, but not the right kind for my dear brother. I have the bottled foods and the foods in boxes and sweet cakes; will you come down, armed man, sir?"

Cade prudently swung the great cherry-wood chest wide open and de-

scended the stairs. The woman lighted his way to a corner with the candle; he expected to find a table or larder, but the light to his disgust flickered on the wasted body of a tall man propped against the cellar wall.

"That's no concern of mine, Commoner," he said. "Where is the food? I'll take it and eat it upstairs."

"Armed man, sir, I must unlock three locks on this chest"—she gestured with the candle—"to get you that and my hands are old and slow, sir. Let me pour you a bit for your thirst first, sir. You are truly an armed man, sir?"

He ignored her babble as she poured him cider from a jug. "So that on your hip is a gun, sir? Is it true, sir, that you only have to point it at a person and he is shriveled and black at once?"

Cade nodded, suppressing his irritation with effort. She was old and foolish—but she was feeding him.

"And is it true, sir," she asked eagerly, "that a shriveled and black Commoner cannot be told from a shriveled and black armed man?"

That, it was impossible to let pass. He struck her mouth, wishing furiously that she would get the food and be done with it. And truly enough she did begin to fumble with the clanking old locks in the dark, but kept up her muttering: "I see it is true. I see it is true. That is what happens when something is true. I call my daughter a lazy slut and she strikes me on the mouth. I call her husband a greedy hog and he strikes me on the mouth. That is what happens—"

Rage is a peril, he told himself furiously. Rage is a peril. He gulped down the cider and repressed an impulse to throw the mug at the old fool's head or smash it on the old fool's floor while she fumbled endlessly with the clanking locks. He bent over to put it precisely on the floor, and toppled like a felled oak.

At once he knew what had happened and was appalled by the stupidity of it. He, a Gunner, was dying, poisoned by a babbling idiot of a Commoner. Cade dragged feebly at his gun, and found the squeaking old woman had taken it first. Better to die that way, he thought in agony, though still a shameful horror. He hoped desperately as he felt consciousness slipping away that it would never become known. Some things were better forgotten.

The old woman was standing in front of him, making a sign, a detestable sign he half-remembered, like a parody of something you were dedicated to. And she skipped nimbly up and down the stairs with shrill, batlike laughter. "I tricked you!" she squealed. "I tricked them all! I tricked my slut of a daughter and her greedy fat husband. I didn't want to go with them!" She stopped at last, grunting with animal effort as she tugged the body of her brother, an inch or less at a time, to the foot of the stairs. Cade's gun

was in the waistband of her skirt.

As the last light glimmered out, he thought he saw the deep-etched leather lines of her face close to his. "I wanted an armed man, sir, that's what I wanted," she cackled, "and I have one now!" Dried old lips parted over the blackened stumps of her teeth as she grinned in senile delight.

III.

Peril . . . peril . . . rage is a peril, and vanity, and love of ease . . . This death was fraught with perils. Cade groaned in the endless dark, and the still-living flesh shrank with revulsion as the evil vision persisted and his limbs were logs of stone. *This end is not fitting!* he would have cried bitterly, but his lips had turned to ice, frozen shut, and the struggling spirit inside could not breath a word of protest or command.

To come to this end, this useless end! He who had lived decorously, who had served fittingly, he a sturdy pillar of the Emperor, Gunner Cade! It was no fitting death.

And still his heart beat pitilessly, pumping gall and fury through his veins.

Rage is a peril. Cade turned his eyes inward in meditation, seeking resignation. *Armsmen march where the Emperor wills. Peril flees in the face of fitting service.*

Two visions filled his inner eye. He turned from the ancient ugly face of evil to the fair countenance of service and he knew at last that this death was as the Emperor willed. If She appeared, then all was well and would be, for She came only at the last to the Armsmen who marched where the Emperor willed and died in the service of his Star.

Then this was a fitting end! The perils of rage and vanity had been only a trial. He looked again upon the ugly grinning face and found it had lost all power over him. The pure features of The Lady floated above and behind it and exaltation coursed through him as his heart beat on.

The heart beat on, and it was fitting but it was not the end. The serene countenance of The Lady bent over him and yet he lived. All Armsmen knew She came only at the last, and only to those who were fitted, yet—

He lived. He was not dead. The frozen lips moved as he muttered, "Vanity is a peril." He was alive, and the lined old leather face was only a hag he had seen before; The Lady was a flower-faced Commoner girl, beautiful to look on, but soullessly mortal.

"Very well," the crimson lips said clearly, not to him, but across his recumbent body to the hag. "Leave us now. They will be waiting for you in the chamber."

"The armed man lives," the old voice rasped in reply. "I served the armed man well and he still lives. My slut of a daughter would never believe

I could do it. She left me behind for dead, she and her greedy—"

"Leave us now!" The younger woman was dressed in the gaudy rough cloth of a Commoner, but her voice betrayed her habit of command. "Go to the chamber, and go quickly, or they may forget to wait."

Cade shuddered as the pincer fingers of the hag creased the flesh of his forearm. "He lives," she said again, and chuckled, "The armed man lives and his skin is warm." Her touch was a horror. Not as the touch of woman, for there was nothing womanish about her; she was past the age of peril. But his skin crawled as with vermin at the unclean fingering. He lashed out to strike her arm away, and discovered his hands were bound. The old woman shuffled slowly away toward a door, and while the young one watched her go, he pulled against the bonds, testing his strength.

Then the hag was gone, and he was alone with the young female: a female Commoner who looked most unfittingly like a vision of glory, and spoke most presumptuously like a man of power.

The bonds were not too tight. He stopped pulling before she could discover that he might free himself.

She was watching him, and perversely he refused to look at her. His eyes took in every detail of the featureless room: the unbroken elliptical curve of the ceiling and walls; the curved door, fitting into the shape of the wall, and almost indistinguishable from it; the bed on which he lay; a table beside him where the girl's long clean fingers played with a vial of colored fluid.

He watched, while she idly turned the cork in the vial to expose the needle end. He watched while she plucked a swab of cotton from a bowl, and doused it in colorless fluid from the only other object in the room, a small bottle on the table. He kept watching, even when the girl began to speak, his gaze obstinately fastened on her hands, away from the perilous beauty of her face.

"Cade," she said urgently, "can you hear me? Can you understand what I tell you?" There was no command in her voice now; it was low-pitched and melodious. It teased his memory, tugged at him till he stiffened with the remembrance. Only once before had a woman called him by his Armsman's given name. That was the day he entered the Order, before he took his vows. His mother had kissed him, he remembered now, kissed him, and whispered the new name softly, as this girl was saying it. Since that day, his eleventh birthday, no woman had dared to tempt him to peril with a familiar address.

He lay still, thrusting aside the memory, refusing to reply.

"Cade," she said again, "there's not much time. They'll be coming soon. Can you understand me?"

The hands on the table moved, put down the needle and the swab, and floated toward him. She placed her palms on his cheeks, and turned his face up to look into his eyes. Cade could not remember, even from childhood, the touch of hands like these. They were silken, but smooth—soft, resilient, unbelievably good to feel. They felt, he thought—and blushed as he thought—like the billowing stuff of the Emperor's ceremonial robe, when it brushed his face as he knelt at devotions on Audience Day.

This was no Audience Day. The hands of a Commoner were on him and contact with any female was forbidden. The blood receded from his face, and he shook his head violently, releasing himself from the perilous touch.

"I'm sorry," she said. "I'm sorry, sir." Then, incredibly, she laughed. "I'm sorry I failed to address you properly, and profaned your chastity with my touch. Has it occurred to you that you are in trouble? What do you place first? The ritual of your Order, or your loyalty to the Emperor?"

"Armsmen march where the Emperor wills," he intoned, "That is their glory. Armsmen are sturdy pillars; without them the Realm cannot stand, but without the Realm the Order cannot—"

Boots, he thought. *Hose*. They were gone. He lifted his head a little, and pain stabbed at the back of his neck as he did so, but before he dropped back, he saw it all: garish crimson-patterned pajamas of a Commoner; soft-soled sandals of a city-worker. *No boots, no hose, no cloak, no gun!*

"What unfit place is this?" he exploded. "In the name of the Order of which I am a member, I demand that I be released and my gun returned before—"

"Quiet, you fool!" There was something in the command that stopped him. "You'll have them all here if you shout. Now listen closely, if there's still time. You are the captive of a group that plots against the Emperor. I cannot tell you more now, but I am instructed to inject you with a substance which will—"

She stopped suddenly, and he, too, heard the steady footsteps coming nearer from—where? A corridor outside?

Something pressed against his lips, something smooth and slippery.

"Open your mouth, you idiot! Swallow it, quick! It will—"

The door opened smoothly from the wall, and the footsteps never lost a beat. They advanced to the center of the room, and stopped precisely, while their maker stared about him with an odd bemusement.

"I seek my cousin," he announced to the air.

"Your cousin is not here," the girl replied smoothly. "I am his helper and I will take you to him." Three steps brought her to the rigid figure.

She touched him lightly on the nape of the neck. "Follow me," she commanded.

With no change of expression on his pale face, the man turned and went after her, his uncannily steady footsteps marking time toward the door. But before they reached it, it opened again and another man sailed in. This one was small and wiry, dressed in the gray uniform of the Klin Service, tunic belted properly over the creased trousers; domed hat set squarely on his head, boot-wraps neatly wound around his calves. He was breathing hard; he closed the door fast and leaned against it.

"Here is your cousin," the girl said coldly. "He will take you in charge now."

Cade stopped struggling with the bonds on his wrists and let his eyelids drop as the man in gray looked toward him and asked: "How is he? Any trouble?"

"*He's* no trouble." The girl's tone was contemptuous. "He's just recovering."

"Good." Cade heard the sharp intake of breath, and then the nervous edginess went out of the man's voice. "I am your cousin," he said evenly. "You will come with me."

"You are my cousin," answered the toneless voice of the sleepwalker. "I am to report that my mission is accomplished. I have succeeded in killing—"

"Come with me now. You will make your report in—"

"Killing the Deskman In Charge of—"

"In another room. You will report to me priv—"

"Of the Third District of Klin Serv—"

"Privately. In another room."

Cade let his eyelids flicker open enough to observe the agitation of the man in gray as the droning report went on unmindful of the efforts at control.

"Service. Am I to destroy myself now? The mission is successfully accomplished." It stopped at last.

And not a moment too soon. Cade's hands, now free, were safely at rest again when the man in gray turned back to look at him.

"Seems to be all right still," he said stiffly, surveying Cade. Deliberately, Cade let his eyelids flutter. "He's coming out of it though. I'd better get this fellow out of the way."

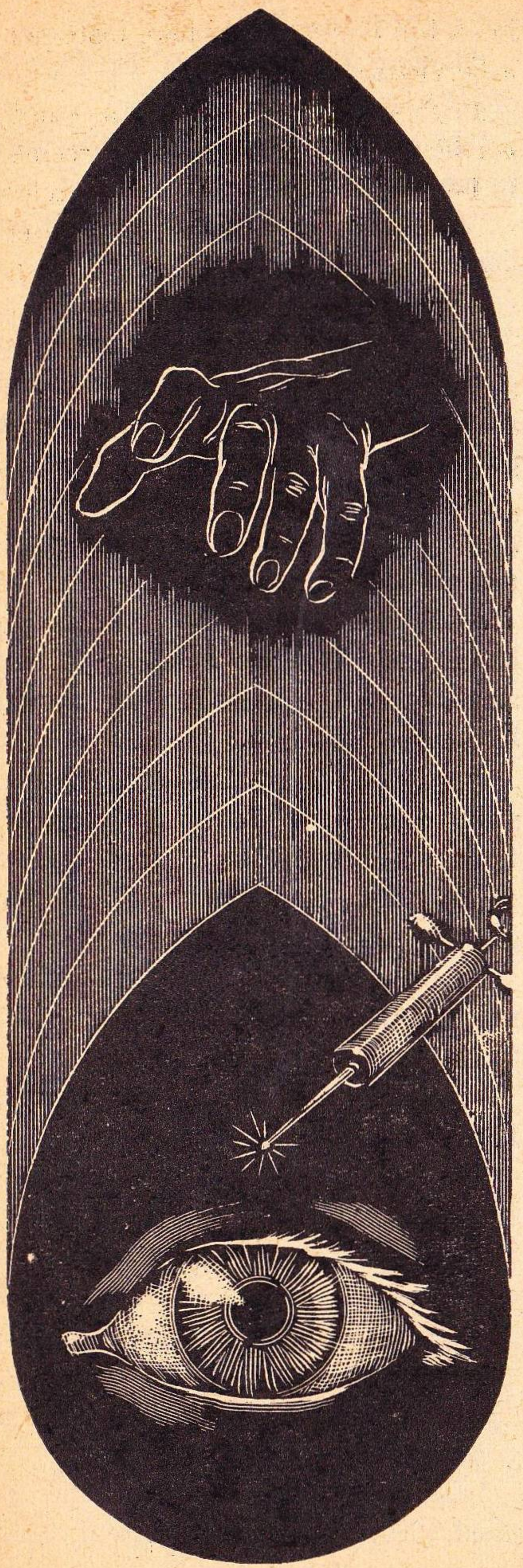
"Perhaps you'd better." The girl's voice now expressed infinite disgust. "Is he one of yours?"

"No, I'm just taking his report. Larter put him under."

"Larter's new," she admitted, and fell silent.

"Well—" There was a moment's embarrassed silence, and Cade let his eyes open all the way, to find the man standing, hesitant, in the doorway. "Maybe I better stay around. He's a gunman, you know. He might—"

"I said I can handle him," she replied. "Suppose you take care of your



man before he gets . . . *watch out!*"

The sleepwalker's eyes were large and brilliant, fascinated by the needle on the table. He saw Cade, stretched out on the bed, and sudden animation flooded his face.

"Don't let them do it to you!" he screamed. "Don't let them touch you. They'll make you like me."

While the other man stood ashen-faced and horrified, the girl acted so swiftly that Cade might almost have admired her, if she had been anything but a female Commoner. She was across the small room, and back again with the needle in her hand even as the man screamed his warning to Cade. Before the Commoner could lift his arm to brush it aside, she drove the needle home, and the plunger after it.

"*S-s-s-s-s-t!*"

The man in gray was ready when she hissed at him.

"You will come with me," he intoned. "You will come with me now. You will come with me."

Cade had seen hypnotists at work before, but never with the aid of a drug so swift as this. He felt the capsule the girl had given him getting warm and moist between his lips. Horror seized him, but he waited as he knew he must till the door was closed behind those inhumanly even footsteps.

He knew how fast the girl could move; he had seen her in action. *Gunners are sturdy pillars. It is fitting that we serve.* His timing was perfection

itself as he spat the dangerous pill from his mouth and leaped from the bed. She had hardly time to turn from the door before his fist caught her a round blow on the side of the head, and she crumpled silently to the floor.

IV.

He had to get out of here.

He had to get back to the Chapter House. He looked at the girl, lying face down on the floor, and was uncomfortably aware of the feel of the rough Commoner clothes against his own skin, and then acutely conscious of a blank feeling on his right hip, where his gun should be.

The Klin Philosophy in a Gunner is like the charge in his gun.

He remembered, and shuddered as he remembered, the awful blandness with which she had admitted plotting against the Emperor. *It is fitting that the Emperor rules. While this is so, all will be well till the end of time.*

Cade took his eyes from the crumpled figure of the girl, and examined the strangely featureless room once more. There was nothing new to be seen. He approached the inconspicuous door. Beyond it, there was a way out. This place of horrors, whatever and wherever it was, would have to be burned from the face of the earth, and the sooner he escaped the sooner it would happen. Without pride but with solid thankfulness he was glad that he, a full Gunner, was here instead of a Novice or an Armiger.

Beyond the door was an empty corridor whose only purpose seemed to be the connection of the featureless room with other rooms fifty meters away. He was suddenly sure that he was underground. There were six doors at the end of the fifty-meter corridor, and he heard voices when he listened at five of them. Calmly he opened the sixth and walked into an empty room about ten by twenty meters, well-lit, equipped with simple benches and a little elevated platform at one end. Along one wall were three curtained booths whose purpose he could not fathom. But he dived into one with desperate speed at the sound of approaching voices.

The booth was in two sections separated by a thin curtain. In the rear section, against the wall, you could look out and not be looked in on. It was an arrangement apparently as insane as the gray, egg-shaped room, but it was a perfect observation post. Through the gauzy inside curtain and the half-drawn, heavier outside curtain, he saw half a dozen Commoners enter the place, chatting in low voices. Their clothes were of the usual cut but a uniform drab brown instead of the ordinary gaudy parti-color.

The drab-clad Commoners fell silent and sat themselves on a front bench as other Commoners in colored clothes began to straggle in and sit. There were about fifty of them. One of the

front-benchers rose and, standing in front of the little stage, did something that Cade recognized; he made the same detestable sign with which the old poisoner had mocked him. Watching carefully, the Gunner saw that it was an X overlaid with a P. The right hand touched the left shoulder, right hipbone, right shoulder, left hipbone, and then traced a line up from the navel to end in a curlicue over the face. It was manifestly a mockery of the Gunner's ten-thousand-year-old ritual when donning his gun. Cade coldly thought: *They'll pay for that.*

All the seated Commoners repeated the sign, and the standing man began to speak, in a resonant, well-trained voice: "The first of the first of the good Cairo." He began making intricate signs involving much arm-waving. It went on for minutes, and Cade quickly lost interest, though the seated Commoners were, as far as he could make out, following raptly. At last the Commoner said: "That is how you shall be known—the first of the first."

Idiotically, twenty Commoners from the back benches got up and filed out. Cade was astonished to see that some of them were silently weeping.

The speaker said when they had left: "The first of the first of the good Cairo in the second degree," and the lights went out, except for a blue spot on the platform. The speaker, standing a little to one side, went through the same signs as before, but much more slowly. The signs were coordinated with a playlet enacted on the stage by the other drab-clad Commoners. It started with the speaker spreading his palms on his chest and an "actor" standing along in the center of the platform. Both speaker and actor then made a sweeping gesture with the right hand waist-high and palm down, and a second actor crawled onto the platform . . . and so on until the first actor, who had never moved, laid his hand successively on the heads of six persons, two of them women, who seemed pleased by the gesture.

About midway through the rigamarole Cade suddenly realized where he was and what it was all about. He was in a Place of Mystery! He, a Gunner, knew little about the Mystery Cults. There were, he recalled, four or five of them, all making ridiculous pretensions to antiquity. Above all, they were ridiculous when you thought of them: Commoners' institutions where fools paid to learn the "esoteric meaning" of gibberish phrases, mystic gestures and symbolic dramas. Presumably a few foxy souls had made a good thing of it. They were always raiding each other for converts, and often with success. Frequenters of Mysteries were failures, stupid even for Commoners, simply unable to grasp the propositions of the Klin Philosophy.

There were—let's see—the Muzzled

Mystery, which had something to do with a crescent and kicking every dog you saw; the Joosh Mystery which had invented a whole language—Hibber? Jibber?—and stuck pins in a statue named Stalin with a cowlick and a small mustache; the Scientific Mystery which despised science and sometimes made a little trouble at the opening of new hospitals. He couldn't place anything called the Cairo Mystery.

But it was frightening. The weak-minded adherents of the Mysteries could swallow anything if they could swallow the Mysteries themselves—even a plot against the Realm of Man.

The lights were on again and the ridiculous proceedings outside apparently were drawing to a close when two more Commoners entered—one of them the man in gray, "Cousin."

"Cousin" murmured something to the drab-clad speaker—Cade could guess what. He burst from the booth towards the door at a dead run.

"Stop him!"

"Sacrilege!"

"A spy!"

"Get him! Get him!"

But, of course, they didn't. They just milled and babbled while Cade plowed through them, made the door—and found it locked.

"Cousin" announced loudly as Cade turned his back to the wall, "Seize him, beloved. It is a Joosh spy trying to steal our most secret rituals."

"He's lying," yelled Cade. "I am Gunner Cade of the Order of Armsmen. My Star is the Star of France. Commoners, I command you to open the door and make way for me."

"A ridiculous pose, spy," said Cousin smoothly. "If you are a Gunner, where is your gun? If you are of the Star of France, *what are you doing here in Baltimore?*"

The Commoners were impressed. Cade was confused. *In Baltimore?*

"Bear him down, my beloved!" shouted Cousin. "Bear down the Joosh spy and bring him to me!"

The Commoners muttered and surged and Cade was buried beneath their numbers. He saw the keen face of "Cousin" close to him, felt the stab of a needle in his arm. For the first time, he wondered how long he had been drugged. *Baltimore!* Of course, the mysteries were world-wide. He could as easily have been in Zanzibar by now, or his native Denver, instead of France, as he had assumed.

There was no doubt about it; the Mysteries would have to be suppressed. Up to now they had been tolerated, for every Mystery solemnly claimed it was merely a minor auxiliary of the Klin Philosophy and that all adherents were primarily followers of Klin. Nobody had ever been fooled—until now.

"He'll be all right now," said Cousin. "Two of you pick him up and carry him. He won't struggle any more."

Gunners march where the Emperor wills; that is their glory. Cade struck out violently with arms and legs at once, as the Commoners attempted to lift him from the floor. Nothing happened—nothing, except that they lifted him easily and carried him out of the big room. *Vanity is a peril.* An emotion flooded Cade, an unfamiliar feeling that identified itself with nothing since earliest childhood. He was frog-marched down the corridor, ignominiously helpless in the hands of two Commoners, and understood that what he felt was shame.

They carried him into the featureless room again, and strapped him to the bed on which he had awakened—how long?—before. He heard Cousin say: "Thank you my beloved, in the name of the good Cairo," and the door closed.

Rage drove out shame and vanity both as a woman's voice said clearly: "You bloody fool!"

"He is, my dear," said "Cousin" unctuously, "but quite clever enough for us. Or he will be shortly, when he understands how to use the limited intelligence his Order has left him." Gleeful satisfaction trickled through the man's voice. "He is quite clever enough—he knows how to kill. And he is strong—strong enough to kill. Let me see the bruise he gave you—"

"Take your hands off me, Cousin. I'm all right. Where will you start him from?"

"He can come to in any park; it doesn't matter."

"If he fell off a bench he might be arrested. Some place with a table for him to lean on—?"

"You're right. We could dump him at Mistress Cannon's! How's that? A chaste Gunner at Mistress Cannon's!"

The girl's laughter was silvery. "I must go now," she said.

"Very well. Thank you, my beloved, in the name of the good Cairo." The door closed.

Cade felt his shoulders being adjusted on the table where he lay. He looked at gray nothingness. There was a click and he was looking at a black spot.

Cousin's voice said: "You notice that this room has little to distract the attention. It has no proper corners, no angles, nothing in the range of your sight for your eye to wander to. Either you look at that black dot or you close your eyes. It doesn't matter which to me. As you look at the black dot you will notice after a while that it seems to swing toward you and away from you, toward you and away from you. This is no mechanical trickery; it is simply your eye-muscles at work making the dot seem to swing toward you and away, first toward you and then away. You may close your eyes, but you will find it difficult to visualize anything but the dot swinging toward you and away, first toward you and then away. You can see nothing but

the dot swinging toward you and away—"

It was true; it was true. Whether Cade's eyes were open or closed, the black dot swung and melted at the edges, and seemed to grow and swallow the grayness and then melt again. He tried to cling to what was fitting—*like this the Order wraps the Realm and shields it*—but the diabolical hypnotist seemed to be reading his thoughts.

"Why fight me, Master Cade? You have no boots. You have no hose. You have no shirt. You have no cloak. You have no gun—only the dot swinging toward you and away. Why fight me? Why fight the dot swinging toward you and away? Why fight me? I'm your friend. I'll tell you what I'll do. You have no boots. You have no hose. You have no cloak. You have no gun. Why fight your friend? You only have the dot swinging toward you and away. Why fight me? I'll tell you what to do. Watch the dot swinging towards you and away—"

He had no boots. He had no hose. He had no cloak. He had no gun. Why fight his friend? That girl, that evil girl had brought him to this. He hated her for making him a Gunner—but he was not a Gunner, he had no gun, he had nothing, he had nothing.

"You don't know. You don't know. You don't know. You don't know. You don't know. You don't know. You don't know. You don't know."

The self-awareness of Cade was no longer a burning fire that filled him from his scalp to his toes. It was fading at his extremities, the lights going out in his toes and fingers and skin, retreating, retreating.

"You will go to the palace and kill the Power Master with your hands. You will go to the palace and kill the Power Master with your hands."

He would go—his self-awareness, a dim light in his mind watched it happen and cried out too feebly. He would go to the palace and kill the Power Master with his hands. Who was he? He didn't know. He would go to the palace and kill the Power Master with his hands. Why would he? He didn't know. He would go to the palace and kill the Power Master with his hands. He didn't know. The spark of ego left to him watched it happen and was powerless to prevent it.

V.

Blackness and a bumping—rest and a sensation of acceleration—a passage of time and the emergence of sounds—a motor, and wind noise, and voices.

Laughter.

"Will he make it, do you think?"

"Who knows?"

"He's a Gunner. They can break your back in a second."

"I don't believe that stuff."

"Well, look at him! Muscles like iron."

"They pick 'em that way."

"Naw, it's the training they get. A

Gunner can do it if anybody can."

"I don't know."

"Well, if he doesn't, the next one will. Or the next. Now we know we can do it. We'll take as many as we need."

"It's risky. It's too dangerous."

"Not the way we did it. The old lady came along with him."

A jolt.

"You've got to walk him to Cannon's."

"Two blocks! And he must weigh—"

"I know, but you've got to. I'm in my grays. What would a Klin Service Officer be doing in Cannon's?"

"But . . . oh, all *right*. I wonder if he'll make it?"

Lurching progress down a dark street, kept from falling by a panting, cursing blur. A dim place with clinking noises and bright-colored blurs moving in it.

"E-e-easy, boy. Steady there—here's a nice corner table. You like this one? All righty, into the chair. Fold, curse you. *Fold.*" A dull blow in the stomach. "Tha-a-at's better. Two whiskies, dear."

"What's the matter witcha friend?"

"A little drunkie. I'm gonna leave him here after I have my shot. He always straightens up after a little nap."

"Yeah?"

"Yeah. I don't wanta see any change out of this, dear.

"Thass different."

"Back so quick, dear?"

"Here's ya whisky."

"Righto. Mud in your eye and dribbling down your left cheek, dear. You hear me, fella? I'm going bye-bye now. I'll see you on the front page. Haw! I'll see you on the front page!" The talking blur went away and another, brighter-colored one came.

"Buy me a drink? You're pretty stiff, ain't you? Mind if I have yours? You look like you got enough. I'm Arlene. I'm from the South. You like girls from the South? What's the matter with you, anyway? If you're asleep, why don't you close your eyes, big fella? Is this some kind of funny, funny joke? Oh, fall down dead. Comic!"

Another bright-colored blur: "Hello; you want company? I noticed you chased away Arlene and for that I don't blame you. All she knows is 'buy-me-a-drink;' I ain't like that. I like a nice, quiet talk myself once in a while. What do you do for fun, big fella—follow the horses? Play cards? Follow the wars? I'm a fighting fan myself. I go for Zanzibar. That Gunner Golos — man! This year already he's got seventeen raids and nine kills. That's what you call a Gunner. Hey, big fella, wanna buy me a drink while we talk? Hey, what's the matter with you anyway? Oh, heck. Out with his eyes open."

The blur went away. Vitality began to steal through sodden limbs, and urgent clarity flashed through the

mind. *Go to the Palace and kill the Power Master.* The hands on the table stirred faintly and the mind inside whirred into motion, tabulating knowledge with easy familiarity. You killed people with your hands by smashing them on the side of the neck with the side of the hand below the little finger —sudden but not positive. If you had time to work for thirty seconds, without interruption, you took them by the throat and smashed the tracheal cartilage with your thumbs.

Go to the Palace and kill the Power Master with your hands. One hand crawled around the emptied whisky glass and crushed it to fragments and powder. If you come up from behind, you can break a back by locking one foot around the instep, putting your knee in the right place, and falling forward as you grasp the shoulders.

A gaudily-dressed girl stood across the table. "I'm going to buy you a little drink, big fella. I won't take no for an answer. I got it right here."

His throat made a noise which was not yet speech, and his hands lifted off the table as she stood beside him with a small bottle. His arms would not lift more than an inch from the table. The drink in his mouth burned like fire.

"Listen to me, Cade," said the girl into his ear. "No scenes. No noise. No trouble. As you come to just sit still and listen to me."

Like waking up. Automatically the morning thought began to go through his mind. *It is fitting that the Emperor rules. It is fitting that the Power Master—*

"The Power Master!" he said hoarsely.

"It's all right," said the girl. "I gave you an antidote. You're not going to—do anything you don't want to." Cade tried to stand, but couldn't. "You'll be all right in a minute or two," she said.

He saw her more clearly now. She was heavily made up, and the thick waves of her hair reflected the bright purple of her gossamer-sheer pajamas. That didn't make sense. Only the starborne wore sheer; Commoners' clothes were of heavy stuffs. But only Commoner females wore pajamas; starborne ladies dressed in gowns and robes. He shook his head trying to clear it and tore his eyes from the perfection of her body, clearly visible through the bizarre clothing.

The gesture did not escape her; she flushed a little. "That's part of the cover-story," she said. "I'm not."

Cade didn't try to understand what she was talking about. Her face was incredibly beautiful. "You're the same one," he said. "The Commoner from that place."

"Lower your voice," she said coolly. "This time, *listen* to me."

"You were with me then before," he accused her. His speech was almost clear and he could move his arms.

"Don't you understand?" she snapped. "If you'd swallowed that

capsule I gave you, you'd never have gone under. But you had to bash me unconscious, break out and try to make it on your own."

She was right about that. He hadn't succeeded in getting out of the place.

"All right," she went on, when he didn't reply. "Maybe you're going to be reasonable after all. You're feeling better, aren't you? The—compulsion is gone? Try to remember that I came after you to give you the release drug."

Cade found he could move his legs. "Thank you for your assistance," he said stiffly. "I'm all right now. I have to get to . . . to the nearest Chapter House, I suppose, and make my report. I—" It went against all training and was perhaps even disobedient, but she *had* helped him. "I will neglect to include your description in my report."

"Still spouting high-and-mighty," she said wearily. "Cade, you still don't understand it all. There are things you don't know. You can't—"

"Give me any further information you may have," he interrupted. "After that may it please the Ruler we two shall never meet again."

The words surprised him, even as he spoke them. Why should he be willing to protect this—creature—from her just punishment? Very well, she had helped him; that was only her duty as a common citizen of the Realm. He was a sworn Armsman. There was no reason to sit here listening to her insolence; the City Watch would deal with her.

"Cade—" She was giggling. That was intolerable. "Cade, have you ever had a drink before?"

"A drink? Certainly I have quenched my thirst many times." She was unfitting, upsetting, and insolent as well.

"No, I mean a drink—a strong alcoholic beverage."

"It is forbidden—" He stopped, appalled. *Forbidden! Love of woman makes men love their rulers less.*

"See here, Commoner!" he began in a rage.

"Oh, *Cade!* now you've done it. We've got to get out of here." Her voice changed to a nasal wheedle; "Let's get out of this place, honey, and come on home with me. I'll show you a real good time—"

She was cut off by the arrival of a massive woman. "I'm Mistress Cannon," said the newcomer. "What're you doing here, girlie? You ain't one of mine."

"We was just leaving, honest—wasn't we, big fella?"

"I was," said Cade; he swayed as he rose to his feet. The girl followed, sticking close to him.

Mistress Cannon saw them grimly to the door. "If you come back, girlie," she said, "I may wrap a bar stool around your neck."

Outside, Cade peered curiously down the narrow darkness of the city street. How did Commoners get places?

There was no way even to orient himself. How had they expected him to get to the Palace?

He turned abruptly to the girl. "What city is this?" he demanded.

"Aberdeen."

That made sense. The ancient Proving Grounds where he himself and all the Armsmen for ten thousand years had won their guns in trial and combat. The city of the Palace, the awesome Capitol of the Emperor himself, and in the Palace, the High Office of the Power Master, the grim executive.

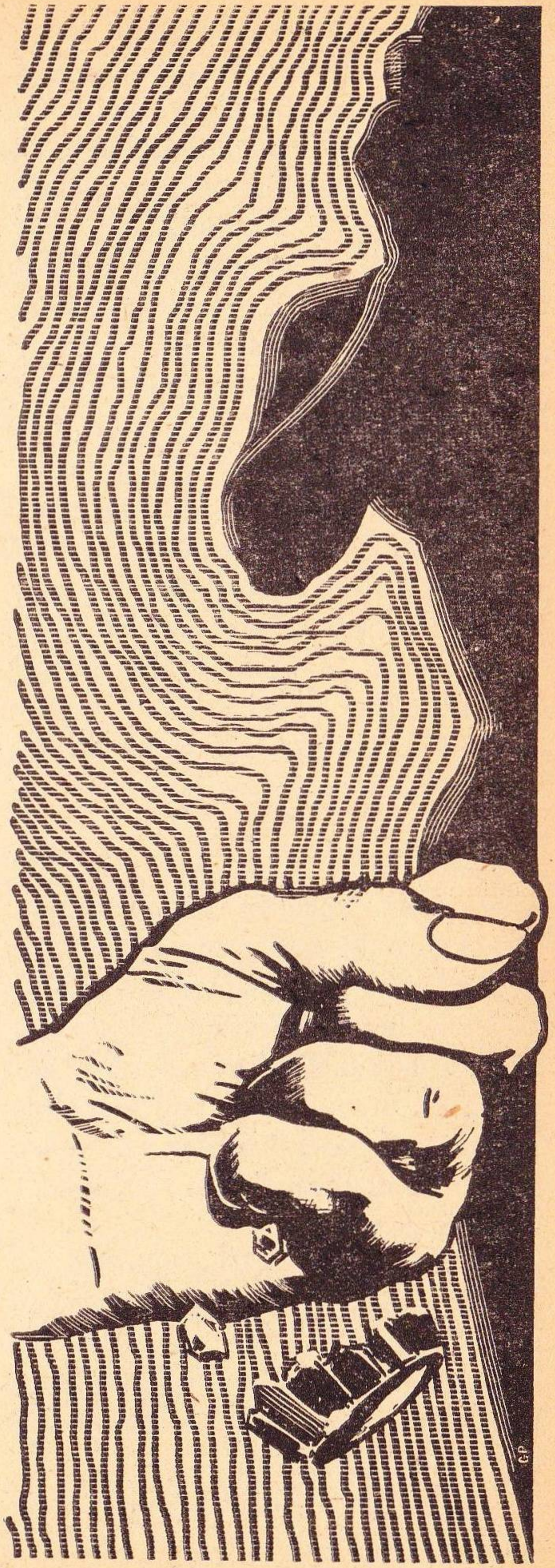
"There is a Chapter House," he remembered. "How do I get there?"

"Gunner, understand me. You aren't going to any Chapter House. That's the best and quickest way to get yourself killed."

A typical Commoner's reaction, he thought, and found himself saddened to have had it from her. She had, after all, incurred some risk in defying the plotters.

"I assure you," he said kindly, "that the prospect of my eventual death in battle does not frighten me. You Commoners don't understand it, but it is so. All I want to do is get this information into the proper hands and resume my fitting task as Gunner."

She made a puzzling, strangled noise and said after a long pause: "That's not what I meant. I'll speak more plainly. You had an alcoholic drink tonight—two of them, in fact. You're not accustomed to them. You are what is called, among us Com-



moners"— she paused again, swallowing what seemed inexplicably like laughter—"blasted, birdy, polluted, or drunk. I'll be merciful and assume that your being blasted, birdy, polluted or drunk accounts for your pompous stupidity. But you are not going anywhere by yourself. You're going to come with me, because that's the only safe place for you. Now please stop being foolish." Her face was turned up to his, pleading, and in the wandering rays of light from a distant street lamp, she seemed more than ever the perfect likeness of The Lady, the perfection of womanhood that could never be achieved by mortal females. Her hand slipped easily around his arm, and she clung to him, tugging at him, urging him to follow her.

Cade didn't strike her. He had every reason to, and yet, for some reason he could not bring himself to shake her off as he should have done, to throw her to the ground, and leave her and be rid of her peril forever. Instead he stood there, and the flesh of his arm crawled at the soft touch of her hand through the commoner's cloth he wore.

"If you have nothing more to tell me," he said coldly, "I'll leave you now." They were at a corner; he turned up the side street and noticed that there were brighter lights and taller buildings ahead.

The girl didn't let go. She ran along at his side, holding on, and talking in a furious undertone, "I'm trying to save your life, you idiot. *Will* you stop this nonsense? You don't know what you're getting into!"

There was a Watchman standing across the street, on the opposite corner, a symbol of familiar security in immaculate Service gray. Cade hesitated only an instant, remembering where he had last seen that uniform desecrated. But surely, surely, that was not cause enough to lose all faith.

He turned to the girl at his side. The touch of her hand was like fire against his arm. "Leave me now," he told her, "or I cannot promise for your safety."

"Cade, you mustn't."

That was intolerable. *Love of woman,* he thought again, and shook off her arm impatiently as he would have brushed away an insect or vermin.

He strode into the street. "Watchman!"

The man in Grays lolled idly on his corner.

"Watchman!" Cade called again. "I desire to be directed to the Chapter House of the Order of Armsmen."

"Your desires are no concern of mine, citizen."

Cade remembered his Commoner's clothing, and swallowed his ire. "Can you direct me . . . sir?"

"If I see fit. And if your purpose is more fitting than your manner. What business have you there?"

"That is no concern—" He stopped

himself. "I cannot tell you . . . sir. It is an affair of utmost privacy."

"Very well, then, citizen," the Service man laughed tolerantly, "find your own way—privately. He was looking past Cade, over the Gunner's shoulder. "Is *she* with you?" he asked with alerted interest.

Cade turned to find the girl right behind him again.

"No," he said sharply.

"O.K., girlie," the Watchman demanded. "What're you doing outside the district?"

"The district—" For the first time Cade saw her falter. "What do you—?"

"You know what I mean. You're not wearing that garter for jewelry, are you, girlie? You know you can't solicit outside the district. If you was with this citizen, now—" He looked meaningfully at Cade.

"She is *not* with me," Cade said wearily. "She followed me here, but—"

"Oh, what a dirty lie!" the girl whined, suddenly voluble. "This fella picked me up in a bar, it was Cannon's place, you can ask anybody there, and he kicked up such a brawl they booted us and then he said come over to my place and then we get here and all of a sudden he remembers something else and he leaves me flat. These muffs that get loaded and then don't know *what* they want!" She wound up on a note of disgust.

"Well, how about it, citizen? Was she with you?"

"She was not," Cade said emphatically. He was staring at the garter the Serviceman seemed so concerned about. It was a slender chain of silver links fastened high on the girl's thigh, pulling the thin folds of her pajamas tight against her flesh.

"Sorry, girlie," the Watchman said firmly but not unkindly. "You know the rules. We're going to the Watch House."

"There, you see?" She turned on Cade in a fury. "See what you did? Now they'll fine me for soliciting and I can't pay, so it means sitting it out in a cell, all on account of you don't know what you want. Come on, now, admit it how you made me come with you. Just tell him, that's all I ask."

Cade shook her off with disgust, "You were following me," he said. "I told you I'd keep you out of trouble if I could, but if you're going to insist on—"

"All right now," the Serviceman said, suddenly decisive. "That'll be enough out of both of you. You both come along and you can get it straightened out in the Watch House."

"I see no reason—" Cade began, and stopped even before the Watchman began to reach for the light club in his belt. He did see a reason, a good one—at the Watch House, he would be able to get direct transportation to the Chapter House. "Very well," he said coldly. "I shall be glad to come along since you insist."

"You idiot," said the girl.

VI.

"Well, which one of you is making the complaint?" The bored officer behind the desk looked from the girl to Cade and back again.

Neither replied.

"She was out of her district," the Watchman explained, "and they couldn't get together on whether she was with him or not, so I took 'em both along in case you wanted to hear it all."

"Official infringement on the girl, huh?" the Deskman muttered. "If she don't want to make a complaint, we got nothing against the man. All right. Matron!" A stout clean-looking woman in gray got off a bench along the wall and approached the desk. "Take her along and get her name and registration. Fine is ten greens—"

"Ten greens!" the girl broke in miserably. "I haven't even got a blue on me. He was the first one tonight—"

"Ten greens," he said implacably, "or five days detention. Tell your troubles to the matron. Take her away. Now—" He turned to Cade as the stout woman led the girl away. "We'll take your name and address for the record and you can go. Those girls are getting out of hand. Soliciting all over town if you let 'em get away with it."

It was too much to unravel now. Cade dismissed the puzzle from his mind, and said, in a low voice: "May I speak to you alone?"

"You out of your head, man? Speak up, what do you want?"

The Gunner looked around. No one was too close. He kept his voice low. "It would be well if you speak more respectfully, Watchman. I am *not* a Commoner."

Comprehension came over the man's face. He stood up promptly, and led Cade into a small side room. "I'm sorry, sir," he said as soon as the door was closed behind them. "I had no idea. The gentlemen usually identify to the Watchman on street duty when such incidents occur. You're a young gentleman, sir, and perhaps this is your first . . . little visit to the other half? You understand, sir, you needn't have been bothered by coming here at all. Next time, sir, if you'll just identify to . . ."

"I don't believe you quite understand," Cade stopped the meaningless flow. "I desired to come here. There is a service you can do for me and for the Realm."

"Yes, sir. I know my duty, sir, and I'll be glad to assist you in any way you deem fitting. If you'll just identify first, sir, you understand I have to ask it, we can't chance ordinary citizens passing themselves off as—"

"Identify? How do I do that?"

"Your badge of rank, sir." He hesitated, and saw confusion still on Cade's face. "Surely, sir, you didn't come out without it?"

The Gunner understood at last. "You misunderstand," he said indig-

nantly. "I have heard of the degenerates among our nobility who indulge in the . . . kind of escapade you seem to have in mind. You are presuming when you class me with them. I am a Gunner in the Order of Armsmen, and I require your immediate assistance to reach the nearest Chapter House."

"You have no badge of rank?" the Deskman said grimly.

"Armsmen carry no prideful badges."

"Armsmen carry guns."

Cade kept his temper. "All you have to do is get in touch with the Chapter House, Deskman. They can check my fingerprints, or there might be a Gunner there who can identify me personally."

The Deskman made no answer; he walked to the door and pushed it open.

"Hey, Bruge," he called. The Watchman of the street got to his feet, and came toward them. "You want to put a drunk-and-disorderly on this fella? He's either cockeyed drunk, or out of his head. Was he acting up outside?"

"The girl said he was drinking. Can't smell it much," the other man said reflectively.

"Well, you're the one'll have to register the complaint. I'm not letting him out of here tonight. He's been telling me in deepest confidence that he's really a Gunner in the Order—"

"Say, that's how the whole thing started," Bruge remembered. "He came up to me asking where was the Chapter House. I figured he was just a little cracked, and I wouldn't of pulled him in at all except for the argument with the girl. You think he's off his rocker?"

"I don't know." The Deskman was silent for a moment, then made up his mind. "I'll tell you what, you sign a d-and-d, and we'll see how he talks in the morning."

Cade could endure no more of it. He strode angrily between the two men. "I tell you," he announced loudly, "that I am Gunner Cade of the Order of Armsmen and my Star is the Star of France. If you do not do what is necessary to identify me immediately, you will pay dearly for it later."

Another Watchman, who had listened idly from a bench, stood up and joined them. "I'm a fighting fan myself. It's a real privilege to meet up with a real Gunner, firsthand." He was short and stout, and there was an idiotic smile on his beaming moonface, but at least he seemed more alert than the others. "I hate to bother you, sir, at a time like this, but I was having a little argument just yesterday with Bruge here and you could settle it for us. Could you tell me, sir, for instance, how many times you've been in action this year? Or, say, your five-year total?"

"I really don't remember," said Cade impatiently. "This is hardly a fitting time for talk of past actions. I must report immediately to the near-

est Chapter House. If your superior sees fit to do his duty now and call the House for identification, I shall endeavor to forget the inconvenience I have suffered so far."

"How about it, chief?" the moon-faced one appealed to the Deskman, turning his face away from Cade. "Why don't you let Bruge here make a call for the Gunner? It's only sporting, isn't it?"

There was an unexpected smile on the Deskman's face when he replied. "O.K.—go on, Bruge, you go call up." He winked in a friendly fashion.

"All right," said Bruge, disappointedly, and left the room.

"I wonder, Gunner Cade," Moon-face said easily, "how many men you've killed since you became Armiger? Say, in offensive actions compared with defensive actions?"

"Eh? Oh, I've never kept count, Watchman. I don't know any Gunners who do." This fellow was at least civil, he thought. There was no harm in answering the man's questions while he waited. "Numbers killed don't mean everything in war. I've been in engagements where we'd have given half of our men to get control of a swell in the ground so unnoticeable that you probably wouldn't see it if you were looking right at it."

"Think of that!" marveled one of the Watchmen. "Did you hear that? Just for a little swell in the ground that slobs like us wouldn't even notice. Hello, Jardin—" He hailed another man in gray who had just entered. "Here's the man you want," he told Moon-face. "Jardin can give you facts and figures on the Gunner."

"You mean Cade?" the new man said unhappily. "Yeah, I sure can. It's only eight kills for the second quarter. He would have hit twelve, sure, only—"

"Yeah, it's a shame all right," Moon-face broke in. "Jardin, I've got a real treat for you. A France fan like you, and Gunner Cade is your favorite, too. Well, here's the thrill of a lifetime, man. Gunner Cade, himself, in person. Jardin, meet the Gunner. Gunner Cade, sir, this is a long-standing fan of yours."

Two more men had come in, and another was at the door. They were all standing around listening. Cade regretted his earlier impulse to answer the man's question. A distasteful familiarity was developing in Moon-face's attitude.

"Quit your kidding," Jardin was saying, almost angrily. "I don't see what's so funny when a good Gunner dies."

"I tell you the man says he's Gunner Cade. Isn't that true?" Moon-face appealed to the Gunner.

"I am Gunner Cade," he replied, with what dignity he could muster.

"Why, you—!"

The outburst from Jardin was stopped abruptly by the Deskman.

"All right, that's enough now," he

said sharply. "This farce is no longer fitting to our honored dead. Jardin is right. Fellow," he said to Cade, "you picked the wrong Gunner and the wrong Watchman. Gunner Cade is dead. I know because Jardin here lost twenty greens to me on him. He was silly enough to bet on Cade for a better second-quarter total of kills than Golos of Zanzibar. Golos topped him with . . . but never mind that. Who are you, and what do you think you're doing impersonating a Gunner?"

"But I *am* Gunner Cade," he said, stupefied.

"Gunner Cade," said the officer patiently, "was killed last week in the kitchen of a house in some French town his company was attacking. They found his body. Now, fellow, who are you? Impersonating a Gunner is a serious offense."

For the first time, Cade realized that Bruge had left, not to call the Chapter House, but to collect the crowd of Watchmen who had assembled while they talked. There were eleven of them in the room now—too many to overpower. He remained silent; insisting on the truth seemed hopeless.

"That's no d-and-d," the Deskman said in the silence. "We'll hold him for pyscho."

"Want me to sign the complaint?" It was Bruge, grinning like an ape.

"Yeah. Put him into a cage until morning and then to the psycho."

"Watchman," said Cade steadily, "will I be able to convince the psych, or is he just another Commoner like you?"

"Hold him!" Two of them expertly caught Cade's arms. The questioner flicked a rubber truncheon across Cade's face. "Maybe you're crazy," he said, "but you'll show respect to officers of the Klin Service."

Cade stood there, the side of his jaw growing numb. He knew he could break loose from the Watchmen holding him, or disable the man with the truncheon by one well-placed kick. But what would be the good of it. There were too many of them there. *It is fitting that we Gunmen serve*—but the thought trailed off into apathy.

"All right," said the man with the truncheon. "Put him in with Fledwick."

The Gunner let himself be led to a cell and locked in. He ignored his cell mate until the man said nervously: "Hello. What are you in for?"

"Never mind."

"Oh. Oh. I'm in here by mistake. I'm a Klin Teacher. I am attached to the lectory at the Glory of the Realm ground car works. There was some mix-up in the collections, and in the confusion they concluded I was responsible. I should be out of here in a day or two."

Cade glanced uninterestedly at the man. "Thief" was written all over him. So Klin Teachers could be thieves.

"What does a silver garter on a girl

mean?" he suddenly demanded.

"Oh," said Fledwick. "I wouldn't know personally, of course." He told him.

Curse her, thought Cade. He wondered what had happened to her. She'd said she couldn't pay the fine.

"My real vocation, of course, was military," said Fledwick.

"*What?*" said Cade.

Fledwick hastily changed his story. "I should have said, 'the military teachership.' I was never really happy at the Glory shop. I'd rather serve humbly as a Teacher in an obscure Chapter House of the Order." He raptly misquoted: "It is fitting for the Emperor to rule. It is fitting for the Power Master to serve the Emperor."

"Interested in the Order, eh? Do you know Gunner Cade?"

"Oh, *everybody* knows Gunner Cade. There wasn't a smile in the Glory shop the day the news came of his death. The factory pool drew Cade in the 'stakes and it's play or pay. Not that I know much about gambling, but I . . . uh . . . happened to have organized the pool. It was so good for the employees' morale. When I get out of here, though, I think I'll stick to dog bets. You get nice odds in a play-or-pay deal, but there's a perfectly human tendency to think you've been swindled when your Gunner is . . . so to speak . . . scratched and you don't get your money back. I've always thought—"

"Shut up," said Cade. You'd think the fools could tell the difference between her and . . . oh, *curse* her. He had worries of his own. For one thing, he was dead. He grinned without mirth. He had to get to the Chapter House and report on the Cairo Mystery, but he was in effect a Commoner without even a name. A Gunner had no wife or family except his Brothers in the Order—and the Watchmen were not going to bother the Order. They *knew* Cade was dead.

He wondered if this were happening for the first time in ten thousand years.

Everything was all wrong; he couldn't think straight. He stretched out on the jail cot and longed for his harder, narrower sleep bag. *It is fitting that the Emperor rules*—He hoped she wouldn't antagonize them with her disrespectful way of talking. Curse her! Why hadn't she stayed in her own district? But that went to prove that she didn't really know anything about the trade, didn't it?

"You!" he growled at Fledwick. "Did you ever hear of a prostitute wandering out of her district by mistake?"

"Oh. Oh, no. Certainly not. Everybody knows where to go when he wants one. Or so I'm told."

A crazy thought came to Cade that if he were dead, he was released from his vows. That was nonsense. He wished he could talk to a real Klin Teacher, not this sniveling thief. A

good Klin Teacher could always explain your perplexities, or find you one who could. He wanted to know how it happened that he had done all the right things and everything had turned out all wrong.

"You," he said. "What's the penalty for impersonating a Gunner?"

Fledwick scratched his nose and mused: "You picked a bad one, sir. It's twenty years!" He was jolted out of his apathy. "I'm sorry to be the one to tell you, but—"

"Shut up, I've got to think."

He thought—and realized with twisted amusement that one week ago he would have been equally horrified, but for another reason. He would have thought the penalty all too light.

Fledwick turned his face to the wall and sighed comfortably. Going to sleep, was he?

"You," said Cade. "Do you know who I am?"

"You didn't say, sir," yawned the Klin Teacher.

"I'm Gunner Cade, of the Order of Gunmen; my Star is the Star of France."

"But—" The Teacher sat up on the bed and looked worriedly into Cade's angry face. "Oh. Of course," he said. "Of course you are, sir. I'm sorry I didn't recognize you." Thereafter he sat on the edge of his bed, stealing an occasional nervous glance at his cell mate. It made Cade feel a little better, but not much.

It is fitting that the Emperor rules—

he hoped that leaving "the district" was not too serious an offense.

VII.

Cade opened his eyes.

Dingy walls, locked door, and the little Klin Teacher still sitting on the side of his bunk across the cage, fast asleep. At the thought of the man's futile determination to hold an all-night vigil over the maniac who had claimed to be a dead Gunner, Cade grinned—and realized abruptly that a grin was no way for a Gunner of the Order to start his day. He hastily began his Morning Thoughts of the Order, but somewhere, far down inside him, there was a small wish that the Thoughts were not quite so long. He had a plan.

Seconds after completing the familiar meditation he was leaning over the other bunk, shaking the Klin Teacher's shoulder. Fledwick almost toppled to the floor and then sprang to his feet in a terrified awakening. He was about to shriek when the Gunner's big hand sealed his mouth.

"No noise," Cade told him. "Listen to me." He sat on Fledwick's bunk and urged the little crook down beside him. "I'm going to get out of here and I'll need your help to do it. Are you going to make trouble?"

"Oh, *no* sir," the Teacher answered too promptly and too heartily. "I'll be glad to help, sir."

"Good." Cade glanced at the lock

on the cage door—an ordinary two-way guarded radionic. "I'll set the lock to open fifteen seconds after it is next opened from the outside. You'll have to raise some sort of noise to get a Watchman in here."

"You can set the lock?" Fledwick broke in. "Where did you learn—?"

"I told you. I am a Gunner of the Order. I expect your full co-operation because of that. I have a message of great importance which must be delivered to the Chapter House at once. Your service to me, by the way, should win you a pardon."

Cade read on the little man's face the collapse of a brief hope. Fledwick said brightly: "The pardon is immaterial. Whatever I can do to serve the Realm, I will do."

"Very well, you don't believe me. Then I will expect your full co-operation on the grounds that I must be a dangerous maniac who might tear you limb from limb for disobedience. Is *that* clear—and believable?"

"Yes," said Fledwick miserably.

"Excellent. Now listen: you will attract a guard's attention. Say you're ill or that I'm trying to murder you—anything to get him inside. He will come in, close the door and look at you. I will overpower him, the door will open and I will leave."

"May I ask what I am to do then? The City Watch has been known to mistreat prisoners who aided in escapes."

"Save your wit and call me 'sir'! You may come along if you like. You would be useful because I know nothing of the city, of course."

He got up and went over to the lock.

Fledwick was next to him, peering over his shoulder. "You mean you're *really* going to try it? Sir?" There was awe in his voice.

"Of course, fool. That's what I've been saying."

Under the Teacher's dubious stare Cade got to work on the lock. The cage-side half of its casing was off in less than a minute. It took no longer for his trained eye to analyze the circuits inside. Fledwick nervously sucked in his breath as the Gunner's sure fingers probed at tubes, relays and printed "wires." But it was child's play to avoid the tamper-triggers that would have set alarms ringing, and the more sinister contacts designed to send lethal charges of electricity through meddlers—child's play for anybody who could rewire a flier's control panel in a drizzly dawn.

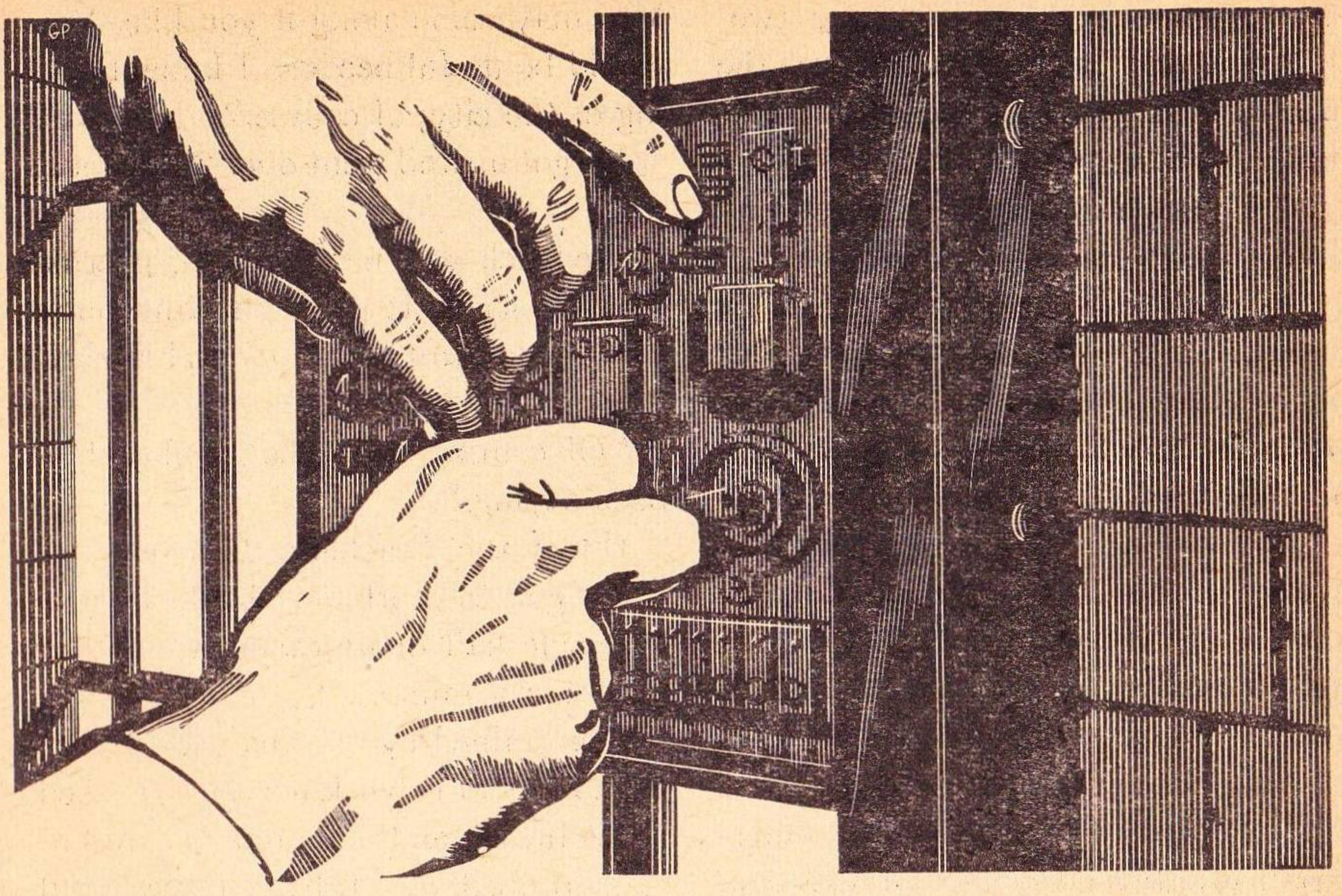
Cade snapped the cover back on and told Fledwick: "Begin!"

The little man was near tears. "Sir, couldn't we wait until after breakfast?"

"What would they give us?"

"Bread and fried sausage today," said the Teacher hopefully.

Cade pretended to consider, and decided: "No. I don't eat meat until nightfall. Did you forget that I am a Gunner of the Realm?"



The little man pulled himself together and said evenly: "I *am* beginning to wonder. I had been thinking of warning the Watchman when he came in."

"Don't! I can silence both of you, if I must."

"Yes, of course. But you needn't worry about me. Your work with the lock—If we get out I know of a cloth-ing warehouse and a certain person who's interested in its contents—and to be frank, perhaps I was overoptimistic when I said the misunderstanding that brought me here was a minor one. There are certain complications."

"Such as being guilty?" suggested Cade. "Never mind. You'll get a pardon from the Gunner Supreme for this morning's work. Meanwhile, think me burglar, lunatic or what you please, but start howling. It will be daylight soon."

Fledwick practiced with a couple of embarrassed groans and then cut loose with a ten-decibel shriek for help on the grounds that he was dying in agony.

Two Watchmen appeared, looking just-waked-up and annoyed. To Fledwick, writhing on his bunk, one demanded: "What's wrong with you now?"

"Cramps!" yelled Fledwick. "Unendurable pain! My belly is on fire;

my limbs are breaking!"

"Yes, yes," said the Watchman. He addressed Cade with exquisite politeness. "Oh star-borne one, go sit on your bunk and put your hands on your knees. My mate's going to be watching you. One move and sleep-gas fills the block. We'll all have a little nap, but when *you* wake up the Desk chief will pound you like a Gunner never was pounded before, oh star-borne one."

He nodded to the other Watchman, who took his stand by a handle that obviously controlled the gas. Cade rejoiced behind an impassive face; the outside Watchman was a slow-moving, doltish-looking fellow.

Fingers played a clicking code on the lock's outside buttons and the door sprang open in a satisfactorily lively manner. The Watchman bent over Fledwick, now moaning faintly, as Cade counted seconds. As the door sprang open again, Cade was on his feet; before it had completed its arc the Gunner's fist was tingling and the inside Watchman lay crumpled half on Fledwick and half on the floor. Cade was through the open door and on the too-stolid fellow outside after the man realized there was something badly wrong, but before he could do anything about it.

Fledwick was in the corridor by then. "Follow me," Cade ordered. It was odd, he fleetingly thought, to have somebody under your command who couldn't half-read your mind through endless training, somebody whose skills were a guess and whose fighting heart was a gamble. They passed empty cells on their way to the guard room. Its door was stout, equipped with a peephole and firmly locked in case of just such an emergency as this.

Through the peephole Cade saw three drowsy Watchmen. The liveliest was at a facsimile machine reading the early-morning edition of a newssheet as it oozed out.

"Boyer," called the newshound. "Gray Dasher won the last at Baltimore. That's one green you owe—where's Boyer?"

"Cell block. Fledwick was yelling again."

"How long ago?"

"Keep calm. Just a second before you came in. He went with Marshal; they haven't been more than a minute."

Cade ducked as the newshound strode to the door and put his own eye to the peephole. "A minute's too long," he heard him say. "Marshal's the biggest fool in the Klin Service and that big maniac's in there with Fledwick. Put on your gas guns."

There were groans of protest. "Ah, can't we flood the block?"

"If we did, *I'd* have to fill out fifty pages of reports. Move, curse you!"

"Can you fire a gas gun?" whispered Cade.

The Klin Teacher, trembling, shook his head.

"Then stay out of the way," Cade ordered.

He was excited himself, by the novelty and his unarmed state. They say we don't know fear, Cade thought, but they're wrong. *Arle, Gunner Supreme, safely dwelling in a fearful place, I pledge that you'll have no shame for me in this action.* Tuned to battle pitch he thought of the wonderful old man, the Gunner of Gunners, who would accept even the coming scuffle as another fit deed by another of his fit sons in the Order. Do the right thing at the right time, Cade told himself, and Arle will be glad.

The stout door unlocked and the newshound came through first. Like a machine that couldn't help itself Cade smashed him paralyzingly with his right arm where the ribs and sternum meet and a great ganglion is unguarded. Cade's left hand took the Watchman's gun and fired two gas pellets through the half-opened door.

One of the Watchmen outside had time to shoot before he went down, but his pellet burst harmlessly against a wall.

Fledwick muttered something despairing about "up to our necks," but Cade waved him into the guard room impatiently. The Gunner reconnoitered the street, found it empty and returned for the Teacher.

"Come along," he said, pitching the gas gun onto the chest of a prostrate Watchman.

Fledwick promptly picked it up. "What did you do that for?" he demanded. Cade glared at him and he hastily added: "Sir."

"Put it back," said Cade. "It's no fit weapon for a Gunner. I used it only because I had to."

There was a look on Fledwick's face that the Gunner had seen before. It was partly puzzled resignation, partly kindliness and affection and—something else that was suspiciously like condescension. Cade had seen it from the star-bornes of the Courts, and especially the ladies. He had seen it often and never understood it.

"Don't you think, sir," said the Klin Teacher carefully, "that we might take the gas gun along in case another emergency arises? I can carry it for you if you find it too distasteful."

"Suit yourself," said Cade shortly, "but hurry." Fledwick dropped the weapon inside his blouse, securing it underneath the waistband.

"Sir," said the Klin Teacher again, "don't you think we should do something about these Watchmen? Roll them behind a door and lock it?"

Cade shrugged irritably. "Nonsense," he said. "We'll be at the Chapter House with everything well again before they're discovered." Fledwick sighed and followed him down the steps and along the empty streets. There was a light mist and a hint of dawn in the sky; the two green lights of the Watch House cast the shadows of the Gunner and the Klin Teacher before them on the pavement, long

and thin.

"How far is the Chapter House?"

"Past the outskirts of Aberdeen, to the north. Five kilometers, say, on the Realm Highway—wide street two blocks west of here."

"I'll need a ground car."

"Car theft, too!"

"Requisition in the Service of the Realm," said Cade austerely. "You need have no part in it."

Theft—requisition. Requisition—theft. How odd things were outside the Order! And sometimes how oddly interesting! He felt a little shame at the thought, and hastily reminded himself: *Gunners march where the Emperor wills—that is their glory.* Yes; march in soft-soled Commoners' shoes, in a requisitioned ground car.

It would be easy—a pang went through him. How easy had it been for the girl? He would investigate with the greatest care. She might suffer from her association with him now that he had broken out.

"Here's a good one," said Fledwick. "From my own shop." Cade surveyed a Glory of the Realm ground car, parked and empty. Fledwick was peering through the window and announced with satisfaction: "Gauge says full-charge. It will get us there."

"Locked?" asked Cade. "I'll take care of—"

Fledwick waved him back calmly. "I happen to be able to handle this myself, because of my, well, familiarity with the model." The little man took off his belt, to all appearances a regulation Klin uniform belt—until it turned out to be of very thin leather, folded triple. From within the folds he took a flat metal object and applied it to the Glory car's lock. There were clicks and the door swung open.

Cade stared at the Klin teacher as he carefully replaced the object in his belt. Fledwick cleared his throat and explained: "I was planning to get one of the Glories out of savings from my meager stipend. There's a clever fellow in the lock shop who makes these, uh, door openers and I thought how convenient it would be to have one if I should ever mislay my combination."

"For the car you hadn't bought yet," said Cade.

"Oh. Oh, yes. Prudence, eh, sir? Prudence."

"That may be. I shall leave you now; there is no need for you to accompany me further and you know, I suppose, that Gunners may consort with those outside the Order only if it is unavoidable. I thank you for your services. You may find pleasure in the knowledge that you have been of service to the Realm." Cade prepared to enter the car.

"Sir," said Fledwick urgently; "I'd find more pleasure in accompanying you. That pardon you mentioned—"

"It will be sent to you."

"Sir, I ask you to think that it might be a little difficult to find me.

All I desire is to see my humble lectory again, to serve fittingly in expounding the truth of Klin to the simple, honest workingfolk of the Glory Shop, but until I get the pardon I'll be—perforce inaccessible."

"Get in," said Cade. "No, I'll drive. You might absentmindedly pocket the steering panel." He started the car and gunned it down the street toward the Realm Highway.

"Hold it at fifteen per," Fledwick warned. "The radar meters kick up a barrier ahead if you speed."

Cade kept the car at fifteen with his eyes peeled for trouble—and to inspect the queer shops that lined the broad highway. It seemed such folly! Shops and shops, selling foodstuffs in small quantities to individuals. Shops and shops selling Commoners' garb, each only slightly different from the next. Shops and shops selling furniture for homes.

Fledwick turned on the ground car's radio; through the corner of his eye Cade saw him tuning carefully to a particular frequency not automatically served by the tap plates.

Why, Cade wondered, couldn't they all be sensible like the Order? A single garb—not, he hastily told himself, resembling in any way the uniform of the Armsmen. Why not refectories where a thousand of them at a time could eat simple, standardized foods? His mental stereotype of a Commoner returned to him: lax, flabby, gorging himself morning, noon and night.

How good it would be to get into the Chapter House in time for a plain breakfast, and to let the beloved routine flow over him. He knew it would quench the disturbing thoughts he had suffered from during the past day. It was all a wonderful proof that the Rule of the Order was wise. *Nor shall any Brother be exposed to the perils of what lies without his Chapter House or the Field of Battle. Let Brothers be transported, by ground if need be, by air if possible, swiftly from Chapter House to Chapter House and swiftly from Chapter House to the Field of Battle.*

How right and fitting it was! The perils were many. Uncounted times he had let his mind be swayed from the Order and his duty in it. When he woke today he had almost willfully chafed at the morning meditation. He could feel the warmth of the Order that would soon enfold him—

"Cade!" shrilled Fledwick. "Listen!"

The radio was saying on what must be the official band: ". . . Claiming to be the late Gunner Cade of France and the unbooked Klin Teacher Fledwick Zisz. Use medium-range gas guns. The Cade-impostor is known to be armed with a gas gun, and has the strength of a maniac. Zisz is unarmed and not dangerous. Repeat, all-Watch alert: Bring in two men escaped this morning from Seventh District Watch House. They are an unidentified man claiming to be the late Gunner Cade of France—" It droned through a

repeat and fell silent.

"They haven't missed the car yet," said Cade.

"They will," Fledwick assured him mournfully. "Or they have missed it and haven't connected it with us yet." He was gloomily silent for three blocks and then muttered angrily: "Unarmed and not dangerous!" He fingered the gas gun through his blouse. "Unarmed indeed! Sir, a little way more and we're out of the city. If they haven't got the noose tight yet—"

"Noose?"

"Blocking-of-exits-from-the-city-by-Watchers. They'll have every gate covered soon enough, but if they don't know about the car they'll cover the public transports first. We do have a chance." It was the first faint note of hope from the little crook.

Cade drove on at a steady fifteen per. The sun was up and cityward traffic grew heavier by the minute. Once they passed a city-bound car trapped by speed bars that had risen, cagelike, from the paving to hold the speeder for the Watch.

"They stop at the city gates," said Fledwick, "and then you can speed up. The Watchers have nothing faster than this."

The noose was not yet tight. They rolled easily past a sleepy Watchman at the gate. Either he hadn't got the alert or he assumed District Seven was no worry of his. Gunner's instinct kept Cade from taking Fledwick's advice and speeding. He rolled the car on at an inconspicuous twenty per, and the decision was sound. A green-topped Watch car from the city passed them and Fledwick shriveled where he sat. But it kept on going, never noticing the fugitives.

Ahead, off to the left of the highway now dotted with cars, was a gray crag. "Chapter House," said Fledwick, pointing, and Cade sighed. The whole insanely unfitting episode at last was drawing to a close.

The radio spoke again: "To all Armsmen and Watchmen." The voice was vibrant and commanding. "To all Watchmen *and* Armsmen," said the voice again, slowly. "This command supersedes the previous all-Watch alert concerning the Cade-impostor and the unbooked Klin Teacher Fledwick Zisz. Both these men are heavily armed and both are dangerous. They are to be shot on sight. Armsmen: shoot to kill. Watchmen: use long-range gas guns. New orders for Watchmen and Armsmen both are: *Shoot on sight!* These men are both dangerous. There is to be no parleying; no calls to surrender; no offer or granting of quarter. Your orders are to shoot on sight. No explanation of any Armsman or Watchman who fails to shoot on sight will be accepted.

"Descriptions and records follow—"

Cade, in frozen shock had slowed the car to a crawl, not daring to make a conspicuous stop. He listened to fair physical descriptions of both of them.

His "record" was criminal insanity, homicidal mania. Fledwick's was an interminable list of petty and not-so-petty offenses of the something-for-nothing kind. He, too, was described as a homicidal maniac.

"You're armed and dangerous now," Cade said stupidly.

His answer was a volley of wild curses. "You got me into this!" raved the little man. "What a fool I was! I could have done my five years standing on one foot! I had friends who could have raised my fine. And you had to bully me into making a break!"

Cade shook his head dazedly. Fledwick's flood of rage poured over him and drained away, powerless to affect him after the shock of the radio announcement.

"But I am Gunner Cade," he said quietly, aloud, as much to himself as to the unbooked Teacher. "A Gunner of the Order."

TO BE CONTINUED

IN TIMES TO COME

Walter Miller, next month, has a yarn called "Dumb Waiter." We're busily building up a civilization of machines to do things, and computing machines to tell machines what to do. The specialists who understand the machines are getting to be fewer and fewer, as the machines get more and more complex. Of course, the extrapolated end of that process will arrive when nobody knows anything about them.

It doesn't have to go quite that far, though; particularly if there is a war to reduce slightly the number of top-level technicians. Machines, no matter how clever their design, aren't smart; a robot bomber will placidly sail forth with empty bomb bays, if the robot bomb-loader has gone through the necessary motions, even though the stock was long since exhausted. Machines obey the rules designed into them with perfect loyalty—and perfect, brainless stupidity. Very few human beings indeed can quite achieve that totally mindless obedience to rules-without-meaning—but a computer-directed robot can go through all the motions of serving perfectly.

It's a bit disquieting though when a robot cop puts you in a robot-operated jail—following computer-tape orders from before the war—and correctly serves the food tray, with all the dishes correctly in place, holding you until the human—and long-dead—Judge arrives. The forms are all observed, but, like the correctly placed dishes on the correct trays—they are empty.

Machines have only instructions; they serve patiently, but are, indeed, the ultimate in Dumb Waiters!

THE EDITOR.

Sometimes the best way to solve a problem is to get someone else to solve it for you. And occasionally the worst threat you can impose on a man is the threat of solving his problem!

MATE IN THREE MOVES

BY MATTHEW M. CAMMEN

Illustrated by Orban

Dr. Anderson pushed open the door of his apartment.

"Is that you, honey?" his wife called from the kitchen. "Come on out. I'm trying one of the French recipes from the cookbook Aunt Helen gave me for Christmas."

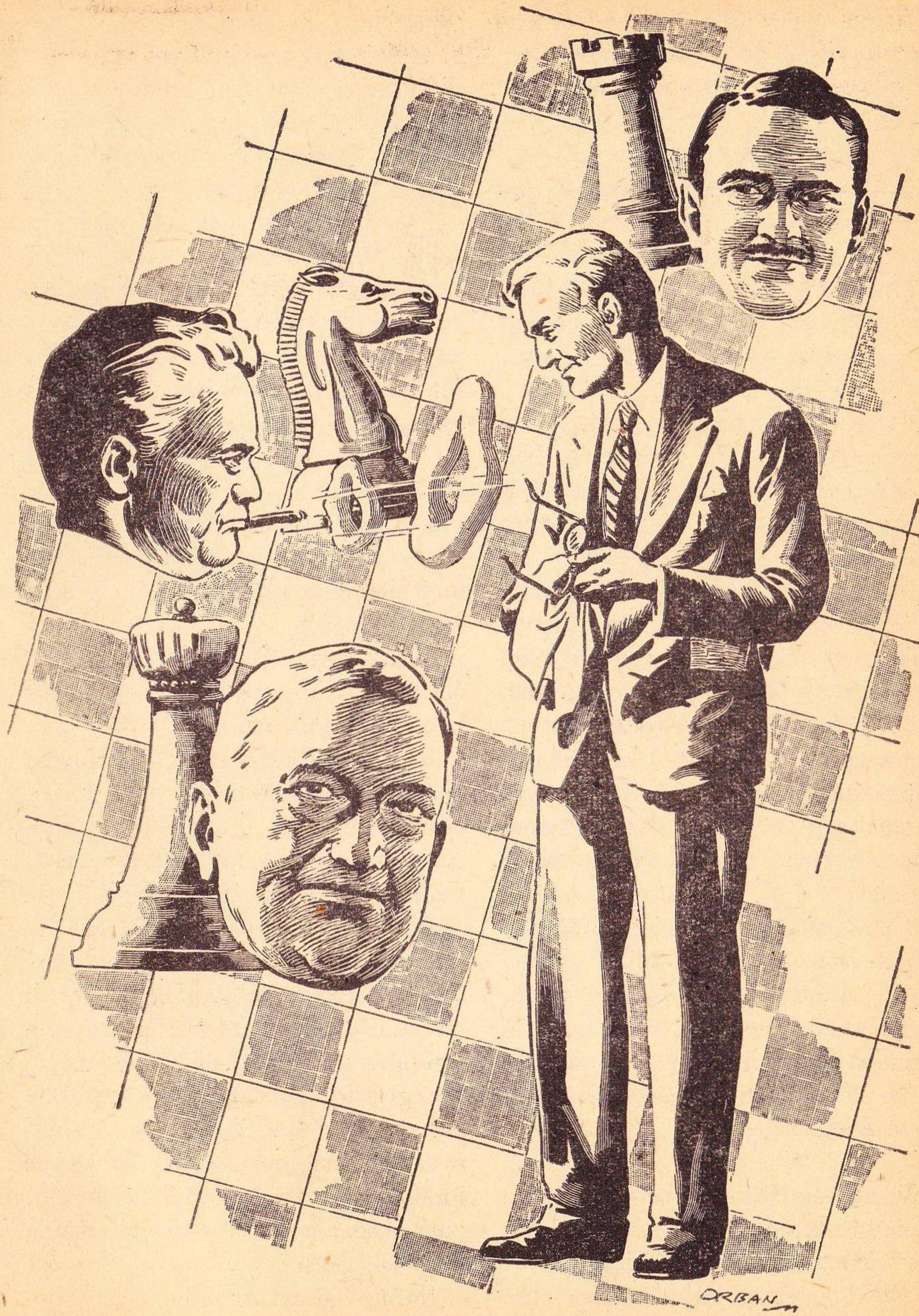
Dr. Anderson walked out to the kitchen. He took his glasses off and began to polish them with his handkerchief. "I've got some bad news, Jeanne," he began.

His wife turned to him quickly. "For goodness' sake, Andy," she said, "what is it? You couldn't sound worse if you'd lost your job."

"That's just what's happened," Dr. Anderson replied. "Not now, but in a couple of months." He opened a wall cabinet at the end of the kitchen. "Glad there's some Scotch left. I can use a drink."

"Wait a minute," Jeanne said. "Let me get this straight. Why are they letting you out? When you came to Washington to take over the section, Radiation Shielding was bogged down so far it looked as if they'd have to ride a Roman candle if they ever wanted to get to Venus. Now—unless you've been handing me a line—you're getting close to the shielding a man-carrying atomic rocket will need. I can't see why they're firing—"

"Say when, Jeanne," Dr. Anderson said as he poured the Scotch. "Adams had me in his office this afternoon to give me the bad news. It seems the trouble is the 1975 budget. Congress is trying to prune nondefense expenses all they can—and I guess the Radiation Shielding section of the Venus Project is it. Or anyway, it's one of them. Adams said he had a reliable story on it. I'll be O.K. until the start of the 1975 fiscal year. That gives me


ORBAN

a couple of months. At that, it was decent enough of Adams to warn me." As he spoke, Dr. Anderson mixed the drinks.

"All right, your boss is a fine guy, if you say so." Jeanne paused, and sipped her drink. She looked at the glass, thought a moment, then drained it in four rapid swallows. "Well, what do we do now? I can go back to pounding a typewriter to keep a roof over our heads, if I have to."

"It isn't that bad. A physicist can always get work in industry today. But I want to work on a spaceship to go to Venus, not on cathodes for TV tubes or—"

"There isn't anything wrong with working on TV tubes, Andy." Jeanne walked over to him and kissed him. "But I know. TV tubes leave you cold. Some people have one-track minds." She kissed him again. "I kind of like your mind," she said. "After all, some of us have to get off Earth before someone finally lets go with a cobalt bomb."

"You learned that song from me," Dr. Anderson said, with no amusement. "I did hope to do my bit to get us off Earth. Well, not much use crying over spilt milk. You might as well finish the supper, Jeanne, unless you want another drink."

Jeanne started for the stove, then turned back slowly. "Say, wait a minute. You said you were being cut out of the budget to reduce nondefense spending. I thought the Department of Defense was back of you?"

"Yes, we're on the 'Indirect Military Applications' list," Dr. Anderson replied. "I hadn't thought of that. That's certainly queer."

"Isn't it?" his wife said meaningfully. "Look, honey, I think there's more to the story than you got. Or even than your nice boss, Mr. Adams, got. Sometimes a Doctor of Philosophy like you can miss a lot. I may have only gone through business school,—"

"Jeanne, I've heard that every time you've handed me a mixed up grocery list. This is serious. I'm losing the job that interests me more than anything else, and all you do is poke fun at me."

"I'm sorry, Andy. I am serious. Look, who do you know who might know the whole story?"

Dr. Anderson thought. "I suppose if Adams doesn't know, none of the other people on the Project would. And I really haven't met too many other people in Washington." He again began to polish his glasses.

"You met me, and that's something." Jeanne thought a moment. "Say, I'm going into the living room and phone a friend of mine—one of the friends of my shorthand days. She might know something. Mix yourself a drink and come on in. If you're drinking, at least you have to put your glasses back on your nose where they belong."

Jeanne dialed rapidly. The tele-

phone was answered promptly, and Jeanne talked. "Hello, Grace. Jeanne Anderson . . . No, I'm getting used to it. Jeanne French sounds funny to me now. After all, it's been two years . . . Yes, pretty good years. Anyway, I've enjoyed them . . . Well, yes, I did have something on my mind. Andy's in trouble. You know, he heads up the Radiation Shielding section on the Venus Project. Well, they're cutting Radiation Shielding out of the 1975 budget. I wondered if you knew anything about it? . . . All about it? Well? . . . So it's your precious boss. I might have known if there was anything shady this side of the Mississippi River, Senator Whitehead would be mixed up in it. Or the other side of the Mississippi, too . . . All right, maybe you can't say it because you work for him, but he's still a weasel. Grace, this is asking a lot, but there's just a chance the senator doesn't realize what he is doing. Do you think you could sneak Andy in on his appointment list? He might be able to talk him around . . . O.K., Thursday at 3. If you ever want anything, I'm your girl forever and ever."

His wife turned to Dr. Anderson. "That was Grace Fermer. She's Senator Whitehead's secretary. It seems he's the boy who held up your money. In spite of the kind of guy he is, he swings a lot of weight. You're to see him Thursday at 3."

"Thank you, Jeanne. You have probably saved the day. When I explain things to him, he can't help but change his mind. After all, a man in the position of the senator must want to do the right thing."

"I hope so, but you don't know Whitehead," his wife answered. "Come on back to the kitchen and talk about the weather. We can't do anything until you see Whitehead anyway."

At a quarter to three on Thursday Grace Fermer looked up as the outer door to the office opened. She suspected that the tall, rather thin man who stepped in might be Dr. Anderson. When he nervously started to polish his glasses she was sure. *Looks just the way Jeanne said he did*, she thought. She said, "Sit down, Dr. Anderson. You have a few minutes to kill before the senator will be able to see you. I told him that your wife was a friend of mine, and asked him to give you fifteen minutes. He said he'd be glad to."

"That was kind of him," Dr. Anderson broke in.

"Sure, he isn't too bad an egg, if it doesn't cost him any money," Miss Fermer answered. "Just don't tell him I let you know he was the boy blocking your Radiation Shielding money. Let him think it was a leak in the Committee. With one or two of the boys they have on Appropriations right now, anything that doesn't leak is a miracle."

"I'll be very careful what I tell him," Dr. Anderson promised.

Just then a buzzer on Miss Fermer's desk buzzed. She snapped down a switch on the intercom set, and spoke, "Yes, senator? . . . Yes, he's here already . . . I'll ask him to step right in." To Dr. Anderson she said, "The senator will see you now." She opened the door to the inner office, and announced, "This is Dr. Anderson, senator. Senator Whitehead, doctor." She stepped out, and closed the door.

"Sit down, doctor, sit down," the senator boomed. "Care for a cigar?"

"No, thank you," Dr. Anderson said. "I never started smoking, so I'm afraid I still don't smoke."

"You're lucky, young man, you're lucky," the senator said. "Often wished I'd never started myself. Anyway, I'm glad to see you. Always glad to talk to a friend of Grace's. Fine girl, Grace."

"I'm not exactly a friend of Miss Fermer's. My wife is." Dr. Anderson liked to be precise even in little things.

"No matter, my boy, no matter." The senator puffed at his cigar, puffed again until it drew properly, then exhaled a cloud of smoke. "Just what did you want to talk to me about?"

"Well, senator, here is the story," Dr. Anderson began. "I'll have to give you a little background first to make it understandable."

"Fine," the senator said.

"The Venus Project began in 1957, just after the first unmanned rocket reached the Moon. We were already in the present stalemate with Russia, and they already had the cobalt bomb. The Project really began to give mankind a chance if someone exploded a cobalt bomb. At least the colonists on Venus would survive."

"Cheerful devils, you scientists," the senator grunted.

"Sometimes facing facts isn't too cheerful. Anyway, the aim of the Project was to plant a colony on Venus—or on some other planet, if Venus proved out of the question. And that meant that chemical rockets were not good enough. We had to have an atomic-powered job."

"What's wrong with chemical rockets?" the senator asked. "One reached the Moon, didn't it?"

"Yes, but it carried only a small charge of flash powder. We need tonnage transport to put a colony on Venus, or anywhere else, for that matter."

"Go on, Dr. Anderson," the senator said.

"The big difficulty with atomic propulsion is how to shield the crew and the cargo from the radiation of the motors. We need a light-weight, efficient shield, and at last we're getting close to it. If the money for the Radiation Shielding section is cut out of our budget, we may end up with a fine spaceship. Only trouble is, no one will ever live through a trip on it. Now, everything that I have said I can prove. I'm sure, senator, that with facts before you—"

"Look, son," the senator interrupted. "I don't know how much of the story you know. Our work on the budget is supposed to be secret. Apparently the secret leaked, like most secrets around this town. Well, apparently you know that I was the man who killed your appropriation. The rest of the Committee weren't interested enough to argue with me. I might as well tell you the entire story, since you're a friend of Grace's."

"I'm not. My wife is."

"You said that before, my boy, you said that before. And I still can't see it makes any difference." The senator had little use for precision, in little things or big things. "You probably heard that the reason we killed your appropriation was to cut non-defense spending." As Dr. Anderson started to interrupt, the senator raised his hand and went on, "Don't bother saying it. You're a defense project, and there's no telling what military advantages will come from space travel. Of course, that wasn't the real reason."

"What was the real reason?" Dr. Anderson asked.

"Nothing you can do anything about, young fellow." The senator leaned back in his chair and blew a smoke ring. Dr. Anderson began to polish his glasses. Finally the senator leaned forward and said, "I don't know why I shouldn't tell you the whole story. You can't do much harm if you do let it out, because you can't prove anything. At least it will keep you from bumping your head against a stone wall."

"Oh," was all Dr. Anderson could think of to say.

"Here it is," the senator continued. "*I'll* have to give *you* a little background first. We're having a presidential election this fall, and my party expects to take over. And you probably realize our presidential candidate will be the present governor of New York. When he is elected, barring accidents, I'm scheduled for Secretary of State." The senator reflectively blew two smoke rings. "That's a long way up from doing chores. You know, young fellow, I really did start on a farm. Never did me any harm in politics, either. Well, one of the accidents that could keep me from becoming Secretary of State is to have the party organization in my own state oppose me for the job."

"But I thought you controlled your State party organization?" Dr. Anderson was honestly puzzled.

"I do, son, I do—on paper." The senator smiled. "Unfortunately, someone else puts up the money. The man who puts up most of it happens to have got it out of mining. He's afraid of competition from mines on Venus. If I don't block that possible competition, he—and his money— will ask for my scalp. And get it, too. Son, I'd like to help you, but my hands are tied."

"But that's ridiculous," Dr. Anderson sputtered. "Our estimate is that

freight will cost about forty-five dollars a pound to Venus. That's no competition for mines on Earth."

"That's today. What about twenty years from now?" the senator asked.

"Twenty years from now is a long way off," Dr. Anderson said, after considerable hesitation.

"My friend back home with the money looks a long way off. That's why he has the money," the senator answered.

"What difference does it make, if we're all killed by a cobalt bomb?" Dr. Anderson asked.

"You know, it's funny, but my friend doesn't seem to worry about that. I suppose he should, because the chances of his being killed after a bomb lets go are a lot higher than of being run out of business by mines on Venus. Still, he doesn't. Son, the first rule I learned in politics was to work with people as they are. Use them, not try to reform them. I've always done that—even with myself." The senator laid down his cigar. "Well, doctor, it's been a pleasure talking to you. Take my advice, and forget the whole business. Get yourself a job in private industry where this sort of thing isn't likely to happen. If you want a reference, get in touch with Grace and I'll give you a good one. In fact, you might ask her to make a note of it as you go. It's been a pleasure talking to you. Hope we've got things straightened out."

"Thank you, senator."

"Jeanne, I don't know what to do now. There isn't any use trying to talk to Senator Whitehead again. I've got to go over his head. And I don't know who that means, except the President. And there isn't any way I can see him." Dr. Anderson held his head in his hands.

"Cheer up, Andy, it could be a lot worse. After all, we're still eating," his wife said. "Now, think hard. Doesn't the President have anyone who checks up on things like the Venus Project for him?"

"Well, yes, there's Rice. He's Chairman of the Interdepartmental Research Co-ordinating Committee—but I don't know him. Wouldn't recognize him if I met him on the street. Don't know anyone who does know him, either. So I guess that's out."

"Out, my foot," his wife said viciously. "You pick up that phone and call your Mr. Rice. Tell him you're Dr. Anderson of Venus Project, and that you want to see him about the Radiation Shielding appropriation."

As Dr. Anderson dialed, he looked at his wife doubtfully. He talked on the phone for about five minutes, first with a secretary and then with the Chairman of the Interdepartmental Research Co-ordinating Committee, Harold Rice himself. When he hung up, he smiled broadly at his wife. "Don't think he'd have seen me if he hadn't been an Iowa State graduate, too. He wants me there day after tomorrow, and I'm to send his secretary

a summary of the story tomorrow, so he'll have a chance to get up to date on it. Come here and kiss me. Maybe I've swung it."

Being an intelligent girl, Jeanne kissed him without comment.

Mr. Harold Rice's office was brilliantly lit, angular, and efficient. Dr. Anderson wondered if the desk in front of Mr. Rice was long enough for a bowling alley, but a quick mental calculation showed it was not.

"What year were you at Iowa State, doctor?" Rice began. "You got out in '68? I'm '60 myself, so I don't imagine we had many friends at college in common. Of course, that's only a detail. Main thing is, we went to the same school. That's the broad general picture. That's the important thing."

Dr. Anderson nodded happily.

"Now, about this complaint of yours, doctor. Can't say I'm pleased about that at all. You say radiation shielding work is being cut out of the 1975 budget. Well, that's too bad. I say it's too bad, because I'm always in favor of spending more money for research. But it's only a detail in the broad general picture of the Venus Project. I can't look after details. I've got to keep the forest in mind, not the trees."

"But it's such an essential—" Dr. Anderson managed to break in.

"The manager of the Project is Adams." Rice went right on. "He's a good man. I helped pick him for the job. Don't you feel we picked a good man, doctor?"

"Adams is an excellent man, but—"

"That's always been my idea of how to run a job, doctor. Pick out a good man, and give him his head. Don't worry about the details of how he runs the job. He's there to worry about details. Important thing is to be sure you've got a good man. Don't you agree, doctor?"

"Why, yes, but—"

"Glad you see the point, doctor. I can't interfere with individual portions of the Project as long as Adams has the overall authority. That's against every principle in the books on management. Can't sacrifice principles for details. Isn't that so, doctor?"

"Well—!"

"I'm glad you agree, doctor. It's been nice to have a chance to talk to you, and I'm glad I was able to. We boys from the corn country have to stick together in Washington. Well, I've got to run now. We're co-ordinating the boll weevil at half past two —that is, co-ordinating boll weevil work. Drop in again any time you feel like a chat."

"You certainly made a mess of that, Andy," his wife said.

Dr. Anderson got up from his chair and walked over to a footstool. He kicked the footstool. Then he looked at his foot, shook it to see if anything was broken, and returned to his chair.

"At that, darling, I suppose I can't

blame you. You never did get a word in edgewise, did you?" She giggled, then caught a glimpse of her husband's face, and stopped giggling. "I'm stuck. I guess the only thing we can do is to call on some expert help. I wonder if Jerry Lewis—"

Dr. Anderson's head snapped up. "Who's Jerry Lewis?"

"I used to know him before I met you. Haven't seen him much since, somehow. He works for Amalgamated Press. Knows a lot about what goes on. Only lives a few blocks away."

"Ask him to come over. We can't lose anything. At least we can give him a drink for his trouble, so he won't lose either." Dr. Anderson walked heavily into the kitchen. "He's out of luck if he likes Scotch, though. I had three shots after I talked to Senator Whitehead, and I guess I finished the bottle tonight."

Jerry Lewis listened to Dr. Anderson's story. He thought to himself that Jeanne had done all right. Her husband might polish his glasses with a handkerchief while he told it, but he certainly told a story clearly. The scientific mind, Jerry thought.

"I'm not particularly surprised," Jerry said when he had heard the entire story. "Whitehead takes care of himself. Rice isn't sure of what he is doing, and he won't risk doing anything that might show it."

"We weren't surprised either, Jerry, after it all had happened," Jeanne said. "The question we'd like you to answer is, where do we go from here?"

"That's a tough one," Lewis said. "What you need is someone who can make Whitehead toe the mark. Since Whitehead seems to be mainly interested in the job of Secretary of State, that means someone who can say whether Whitehead gets the job or not. That's the governor of New York, who'll be our next president if the polls mean anything. And since they've replaced human interviewers with emotographs, the polls do mean something."

"Should we try to talk to the governor?" Dr. Anderson asked.

"No use," Jerry answered. "In the first place, you wouldn't get a chance to see him, and in the second place he only does what O'Connell tells him to do."

"O'Connell?" Jeanne asked.

"O'Connell—Owen O'Connell," Lewis answered. "The leader of the Eleventh Assembly District in New York City. O'Connell put the governor where he is today, and the governor knows it. If the governor gets to be president, he'll still know who put him there."

"Isn't there an Owen O'Connell who is a chess master?" Dr. Anderson asked.

"Same man. It's a funny thing. You wouldn't expect a political boss to be a chess player, but this one is. He's done fairly well in tournaments, too."

"Does Andy see him?" Jeanne

asked bluntly, but hopefully.

"Not much use," Lewis replied. "He isn't interested in anything but politics and chess. You can't show him where he'll gain by helping you, and he isn't the kind of fellow who does a good turn because he's a Boy Scout. From what I hear, he's even more interested in chess than in politics, but Andy doesn't even play chess, so that's no angle."

"Looks as if we're beaten," Jeanne said. "I've used my brains, you've told us all you know, and Andy's gone at it in his straightforward physicist way. And it doesn't add up to a thing. Maybe you'll like working on television tube cathodes, Andy."

"Maybe," Dr. Anderson said. Several minutes passed in silence. Then Dr. Anderson spoke again, hesitatingly. "Maybe you said something, Jeanne. You know, I really haven't been going at this like a physicist. I've been going at it no differently from the way anyone else would. Maybe physics is the answer." He turned to Jerry Lewis. "Your Mr. O'Connell likes to play chess."

"That's what I said," Lewis replied.

"Just wait while I look up one of my college texts." Dr. Anderson walked to the bookshelves along the wall, and hunted for a minute. "Jeanne, did you move von Neumann? Oh, no, here it is." He leafed through the book rapidly, read for a moment, then closed the book and returned it to the shelf.

"Jerry, could you make an appointment for me with O'Connell? I'd like to show him something." Dr. Anderson was excited. "Tell him I'd like to take him for a taxi trip to see something of great importance to him."

"I'll call him right now. That way the call will be on your bill," Lewis said. A few minutes, and considerable discussion later, he hung up. "If he hadn't wondered a little why anyone would call him from Washington to invite him for a taxi trip, I don't think he'd have bitten. He said to pick him up after lunch tomorrow. What do you have in mind?"

"Right now I've got to call a friend of mine in New York," Dr. Anderson evaded. "It's Joe Richards—you've heard me speak of him, Jeanne—who runs a computing service in Long Island City. He's got a pair of the new R-42 computers. He'll help set the stage. While we're talking, you might take Jerry out in the kitchen and fix him a drink."

"Dr. Anderson, that was an interesting story you just told me about the Venus Project and your work in radiation shielding," Owen O'Connell said. He was a big man and an important one, who spoke as though he knew it. "And I'm enjoying our taxi ride to Long Island City. Now, I won't deny that as things stand right now I have some influence with Senator Whitehead—quite a lot of influence,

in fact. However, if I use it I will irritate him. Frankly, you haven't given me a good enough reason to annoy the senator."

"We're here now," Dr. Anderson said. "When you've seen the work we're doing, you may have your answer on why you should bother the senator."

The taxi stopped in front of a small factory building. In the tiny office inside, Dr. Anderson introduced O'Connell to Joe Richards. Then he suggested they go into the computer room.

"Very interesting, gentlemen," O'Connell said. "A modern computer certainly looks simple enough from the outside. I suppose the complications are inside. But perhaps now you are ready to tell me why you brought me here. Is this machine figuring your course to Venus?"

"Oh, no, Mr. O'Connell. It's figuring out a chess problem. Or rather *the* chess problem," Dr. Anderson answered. "One of the two machines, that is. The other is analyzing a market survey for a tooth paste company."

"*The* chess problem? What's that?" O'Connell asked.

"That's a long story," Dr. Anderson said. "About thirty years ago, von Neumann and Morgenstern proved, in a book called 'Theory of Games and Economic Behavior,' that chess was a determinate game—that is, a game in which the result is settled before you even begin to play, provided that both sides play correctly. The catch is that the game is so complicated we don't know what the correct way to play is. As a matter of fact, we don't even know if white should win, if black should win, or if the game should be a draw. There is one way to find out, however. That is simply to sit down and try all the possible moves, play all the possible games, and analyze the results."

"I suppose the reason that's never been done is that there are too many games to play, even in a lifetime." O'Connell smiled.

"Yes, or in several lifetimes," Dr. Anderson smiled back. "Fortunately, an R-42 computer, like the two in this room, can be set to play several thousands of games of chess a second, and analyze the results. We've been running all morning on openings where white opens with king's rook's pawn to rook's three. Next we will check in order the games beginning with the other possible opening moves. In about two weeks we'll have the job finished."

"What will that mean," O'Connell asked.

"Why, for one thing it will pretty much spoil the interest in a game of chess," Dr. Anderson said. "You'll know before you sit down how the game will come out, and what are the correct moves."

"Where's a phone?" O'Connell asked. He dialed rapidly. "Professor

Otis? Owen O'Connell. Professor, is it true that if we checked every possible game of chess we could find out who should win and how to play to win—that there wouldn't be any more reason to play? . . . Yes, I know all about von Neumann and I know no one would live long enough to play all the possible games. Thanks." He hung up. "Well, Dr. Anderson. Mr. Richards. I guess you're right. In a couple of weeks you'll have spoiled my main pleasure in life. I don't know what I'll do if you take the sport out of chess. Take up collecting stamps, perhaps." He shook his head moodily.

Dr. Anderson spoke, picking his words carefully. "Perhaps I should have made it clear, Mr. O'Connell, that I only became interested in the chess problem when the radiation shielding work appeared to be out of the picture. If we get an appropriation for radiation shielding for next year, I doubt I will have enough interest in chess to finish the calculations."

"So that's the game," O'Connell said. "And I always thought physicists were babes in the woods. All right, I'll talk to the governor, and he'll talk to Whitehead. You're perfectly safe in losing your interest in chess—right now for choice. Is that taxi still outside? I can't spend all day here chatting."

"Darling, you were wonderful," Jeanne said, stroking her husband's hair. "Now that you have your money, we'll get to Venus soon. But I feel a little sorry for poor Mr. O'Connell. He should have known he couldn't get the best of my husband."

"But, honey, he could have very easily." Dr. Anderson sat up. "He asked his professor the wrong question. What he should have asked is: How long it would take a computer to play every possible game of chess? Even playing a hundred thousand games a second, we'd all be dead and Earth dead and the sun cold before the computer finished. Oh, well, if O'Connell had been smart enough to ask the right question we would have had to think of something else." Dr. Anderson grinned, sank back, and put his wife's hand to his hair again.

THE END

BLUFF-STAINED TRANSACTION

BY H. B. FYFE

A crook—or even the slightly shady—character operates largely on a basis of bluff. And there's no one who is more of a sucker for a bluff than the professional bluffer!

Illustrated by Cartier

At the control desk, the slim, dark man stared intently into the screen at the swelling image of the nearby planet. His hulking partner addressed yet another grumbling remark to his back.

"You were gonna handle him! Charlie Ferris, the big diplomat!"

Something like a snarl twisted the hairline mustache on the lean man's hard face. He turned impatiently.

"But he had the goods on us!" he exploded. "They don't call it the Bureau of Slick Tricks for nothin'. You know very well, Gerry, we're lucky he let us keep the ship to work out the debt!"

"Which *he* got us into."

"Maybe so," shrugged Ferris. "You wanna go to court about it? An' anyway, after all the talk, I didn't see Fuller gettin' his jaw socked. Why shovel it all off on me?"

"I got a good mind to drop an eclipse over him when we land, if he's there," said the big man sourly.

"Don't forget the orders. We know nothin' an' nobody connected with the B. S. T. on Rerv IV. We're just Charles Ferris an' Gervase Taylor, gentlemen space travelers."

The blond man fell silent. Giving up his goading, he sat sulkily at the astrogation desk of the austere little control room and regarded his big hands. The knuckles were knobby and displayed a number of little white scars. He shook his head slowly.

"Those phony lenses!" he grunted.

"All right, all right! We got back from Kosor, didn't we?" demanded Ferris.

"With our skins, just about."

"*And* the ship. For a while, I didn't think we'd pry the Kosorians loose, but we've still got that. Now if things work out here, we might come out with a stake. There's generally a few credits to be picked up when something smells like this job."

Taylor did not beam with enthusiasm.

"I'd just as soon we kicked off a few light-years—credits or no credits. That slicker'll wind up skinning us again."

"Not . . . this . . . time!" promised Ferris between set teeth.

The silence held for half an hour before Ferris spoke again.

"Time to go into a landing curve," he warned.

Some hours later, the ship flared down out of a hazy sky over one pole of Rerv IV. Ferris tailed down neatly at the only spaceport of the planet, situated on the largest island, and the two men released themselves from the acceleration seats. They checked for damage and leakage as a matter of routine before preparing to leave the ship.

"You sure it's the right place?" asked Taylor.

"Maybe you saw some place else to land?" Ferris challenged. "Sure, it's the right place. Didn't they answer our request for landin' instructions?"

"Could you understand the answer?"

"Well . . . no; but if I can set down guided by some cracked jet talking through a mouthful of mush, that shows what a hot pilot I am. Besides, there ain't anywhere to land but this one ring of islands."

Taylor glanced gloomily at the sketch taped to the astrogation desk. It showed a narrow band of islands

that girdled the small planet about twenty degrees from the pole. Ferris had landed on the largest, several hundred miles long, which bore a spot marked in red as a sizable town.

"So this is New Honolulu, is it?"

"You know any other cities on this planet?" demanded Ferris in exasperation. "Come on—count your teeth an' let's have a look outside!"

Out of long habit, he paused to check the exterior atmosphere, but as he had been informed, it was remarkably like that of Terra in the main. Despite the latitude, the temperature was summery.

They made their way through the air lock and presently stood side by side at the top of the ladder.

"I don't think I want my jacket," said Taylor.

He wore a draped and belted jacket of conservative green, with slacks nearly the same color tucked into high spaceman's boots. In contrast to the dapper Ferris, nothing about Taylor seemed to have been pressed. His shorter friend was gayer in a jacket of black and gold, and his sky-blue slacks were matched by the neck scarf which the humid breeze stirred sluggishly. At infrequent intervals, a flicker of lemon yellow revealed the hue of his shirt.

"Better keep it on," he told Taylor. "No use advertising yet that we're wearing guns."

"I thought we were supposed to advertise it."

"Wait'll we see how to make the best impression," insisted the dark man. "No sense in scarin' one of these pioneer yokels an' then findin' out he don't count."

"I got a good mind to slug the first man or monster I meet?" growled Taylor. "If I close my eyes, it'll feel the same's if it was J. Gilbert Fuller!"

"You slug when an' if I tell you!" ordered Ferris, starting down the ladder. "Here comes somebody now. Let me do the talkin'!"

"You gotta be let?" grumbled Taylor, but he followed down to the ground.

This was firm—somehow the general appearance of the island had suggested mud—and was covered by rocket-scarred traces of a growth not unlike seaweed. At a distance around the wide field and partly screening the low buildings visible beyond one end of it, were stunted, treelike growths with bushy branches. Taylor examined their faded, olive-green color with an expression of distaste.

He joined Ferris, who had advanced a few strides to watch a battered ground-car approaching from the direction of the buildings. As it came nearer, they could see that it was an open truck.

When the vehicle drew up before them with a squeal of brakes, Ferris twitched his shoulders slightly at the hostile looks of the four Terrans riding in it.

The four wore no jackets, and most of the colors seemed to have been bleached out of their sweat-dampened shirts. One carried a dart pistol tucked into his waistband, and the hands of the others lingered near a collection of tools like long-handled machetes. All four were deeply tanned.

"Thought you were Lrymians," said the driver, as if to explain his haste.

The beefy man beside him patted his dart pistol and grunted in disappointment.

"No room for more Terrans here either," he told them ungraciously. "Too many *tohkine* plantations now for the shipping quotas. We let in any more, the price will go down."

"Um-m-m. That the city over there?" asked Ferris, with a jerk of his head.

"That's right," replied the driver, preparing to turn his truck.

"We'll ride back with you, then," said Ferris.

The man with the dart gun took that ill.

"You know what's good for you, you'll climb back in your star-wagon and kick off," he said. "Who asked you to come around Rerv anyway?"

"News gets around," said Ferris evenly. He used his left elbow to edge back Taylor, who showed signs of desiring a closer look at the beefy one. "We heard Rerv IV needed a little organizing."

"Are you with that slimy slicker from the B. S. T. that got here last week?" demanded the driver.

"Maybe; maybe not," parried Ferris. "What slicker?"

"That J. Whatsisname Fuller!" snarled the man beside the driver. "That one with the big talk about Terra annexing this place and controlling the *tohkine* trade. By Sol, if you're friends of his—!"

"I wouldn't say we were friends of the Bureau of Special Trading," Ferris told him.

"Well, then, get back in that space bottle and kick off! We have enough space tramps here now."

He started to get out of the truck when Ferris showed no sign of moving, and the two behind him stirred.

"Gerry!" said Ferris without raising his voice.

The beefy one jumped down, landing with feet widely spread and knees flexed to spring. Taylor moved to meet him like a tack to a magnet. To the echo of a smacking thud, the man jerked upward to the tips of his toes and flipped backward. He bounced once on his shoulders before coming inertly to rest beside the truck.

The pair about to step down crouched where they were, staring open-mouth at a Taylor who had changed in a fleeting instant from a hulking, blond lout to a big cat. The spaceman fixed them with a blue glare and stooped to pluck the dart pistol from the waistband of the unconscious man.

Ferris removed his hand from under

his jacket as his partner slipped the weapon and its load of deadly, poisoned needles into a hip pocket.

"You fellows oughta be careful with those illegal guns," he commented conversationally. "I guess you *do* need organizin'. Like I say, we'll ride back with you. Throw *him* in back, Gerry!"

Taylor's victim had not yet revived by the time they reached the only inn possessed by the ragged looking town that passed for the Terran capital of Rerv IV. Ferris and Taylor obtained a room and sat down to piece together the information that the former had extracted from their hosts on the ride.

The hotel, a magnificent two stories in a rambling metropolis of one-storied buildings of dun bricks and stucco, was at least relatively cool because of its thick walls. It was staffed by Rervites, quiet amphibians who seemed depressed at being ashore.

"They're what make the business go," said Ferris, rising to point out the deeply recessed window at a pair of Rervites plodding along the street below.

The natives were about four feet tall and rotund after a streamlined fashion. They were more or less bipedal—heavy tails showed below the tunics they wore. The fine, greenish scales did not show at this distance, but the mouthful of teeth displayed when one of them opened his mouth would have been visible half a light-year. The eyes set in the otherwise featureless round faces, however, were large and gentle.

"There's about a hundred Terran factors here," Ferris continued, "and very few actually go underwater to work their *tohkine* plantations."

"Dunno why Fuller is so interested in the stuff," said Taylor. "It's no use to Terrans."

"*Sssh!*" cautioned Ferris. "Don't mention his name!"

He moved cat-footed to the curtains that served as a door, and peeped into the hall. Satisfied that they were not being spied upon, he returned to the chair by the window.

"He never said," he explained, "but it's easy to figure out. *Tohkine*, or drugs taken out of it, stops colds in a whole class of nonhumans that trade on Terra. Some of them can die from a cold, and by now they've all carried the sniffles back to their own planets. With some of them, a shot of *tohkine* is like a vaccination."

"You'd think they could make synthetics," said Taylor.

"You can bet they're tryin'. Maybe they will some day; but right now, they gotta get it from underwater plantations on Rerv IV an' nowheres else. That's why these vacuums had it so good till the Lrymians tried to push in."

"They had nothing much to do, the way Fuller put it."

"That's right," agreed Ferris. "The Rervites work the plantations an' dry

the weed on the beaches. But the Terrans control the export, an' you know what that means."

"Keeping the price up by shipping out just so much?"

"Sure. Now these hungry wonders from around Lryme are trying to cut in. You'd think a planet would be big enough for everybody, but maybe not. This is the only land for a base, an' the Terrans got here first."

"You think that's Fuller's angle, to chase the monsters out?"

"What else?" Ferris shrugged. "That's his business, seein' to it that Terrans get the inside orbit on any trade through Sol. I think he got us here to start some sort of riot after we get the Terran factors organized the way he told us. Then, either we pitch the Lrymians out, or he can call for government help."

"Why can't he anyway?" asked Taylor. "Or start the riot himself, if he wants one?"

"I guess he thinks it ain't legal for a man in his position," grimned Ferris.

Taylor snorted.

"What's the matter?" Ferris prodded. "The idea of doin' something illegal bother you?"

In spite of a brief struggle with himself, Taylor had to smile.

"I'll tell you one thing, though, to tuck away in your atomic little head," he declared. "I got a theory that what would bother Fuller would make me turn white. And you, too!"

Ferris grinned and shrugged, but offered no argument.

At dusk, following the lingering afternoon of Rerv IV, they descended to the main hall of the inn for dinner. The green-scaled Rervitè waiter brought them a variety of seafood which he assured them—in mushy speech barely understandable as Terran—would be acceptable to their stomachs.

Some of the dishes consisted of shellfish of exotic appearance, some resembled fish, and some caused Taylor to remark about "pickled spinach." Having visited many planets, however, the two visitors were inured to unfamiliar foods.

They were finishing with a jug of something very like wine—invented by the Terrans from a sea growth, the waiter told them—when a distant hubbub came to their ears.

"Something popping out in the street," muttered Taylor, setting down his tapered cup. "Coming this way, too."

"Wait till it gets here," advised Ferris, pulling him down to the bench again.

They sat quietly at the rough table, watching the few other Terrans present crowd out the door. One of them exclaimed something about Lrymians.

The noise of many voices, Terran and some that were much more shrill, moved closer. Taking the jug with him in one hand and his cup in the other, Ferris drifted to the door. Taylor

stepped lightly after him.

Looking out, they saw an angry Terran in the middle of the street, confronting an unhealthy-looking individual with a dull, blue-white skin who could only have been a Lrymian. From the general position of the crowd, it appeared that the gathering Terrans had blocked the passage of about a dozen Lrymians.

"Bet the snakes were chasing some Terrans up the street," muttered Taylor in his partner's ear.

Now, outnumbered two or three to one, the aliens hesitated. Ferris examined them curiously.

A foot or so taller than humans, the Lrymians were slender in a snakish way that was emphasized by the way their narrow heads were set upon curving necks two feet long. The bulging black eyes, two pointing forward and two backward, seemed too large for their heads.

At first glance, Ferris thought he saw their legs from the knee down, under the long robes they wore belted twice in the length of their skinny bodies. Then he realized that their legs were no longer than he saw, although the four tentacles of each Lrymian were equivalent in reach and setting to human arms.

The tumult was degenerating into what sounded like an outpouring of complaints and countercharges. The shouting Terran was being out-gestured four to two, but he possessed a loud bellow and the Lrymian was slow of speech. It was about even. Ferris filled his cup from the jug and sipped.

"*They* won't fight," grunted Taylor contemptuously.

He half-turned to go inside.

"Wait a minute!" murmured Ferris, grabbing his friend's elbow. "Look over there!"

Lounging at the rear of the Terran crowd, though obviously not a part of it, was a chunky man in still unfaded clothes. He was hatless in the lingering warmth of the twilight and his wavy golden hair was neatly brushed. He wore a handsome purple jacket, but was apparently "roughing it" without a neck scarf.

As his casual blue stare met Ferris' dark gaze over the heads of the crowd, he ran a finger along his blond mustache and looked away with no sign of recognition.

"Well," said Ferris, "he knows we're here. I guess working hours start now, instead of tomorrow."

He poured the last few drops of wine from his jug and nudged Taylor.

"Get out among 'em, Gerry; an' when it starts, you finish it! I'll cover in case things get serious."

He waited, sipping his wine unhurriedly, while Taylor bulled his way to the point in the crowd where the Terrans ended and the Lrymians began. Ferris took a careful look around to make sure he was unobserved.

Then he hurled the jug past his partner . . .

There were about fifty Terrans at the meeting the next morning.

Those too late to find space on the benches covered the tables of the inn hall. Ferris and Taylor lounged on chairs tilted against the Terran-style bar at one end of the chamber, while the beefy man encountered on their arrival haranged the assemblage.

Finally, the speaker hauled out a large handkerchief, mopped his ruddy face, and gestured to Ferris. The lean spaceman rose and surveyed the faces watching him. As a result of Taylor's performance the evening before, they were uniformly friendly.

"I admit," he began, "that when I first met Ludman, we had words. But since last night, Gerry an' me have been thinkin' over what you guys are up against here."

Exclamations of satisfaction greeted the reference to the riot.

"Now," Ferris announced, "there's only one thing to do."

His audience hunched forward.

"You got to get together an' kick those snakes out before any more pile in here. It's a nice setup, but they're gonna squeeze you out if they can!"

"We know that," called a voice above the growls. "What're we going to do?"

"That's easy," Ferris retorted. "There's fifty of you here now; that'll do to start with. All we need is a little organizing. As soon as we get the rest of the Terrans on Rerv IV in, we'll have a solid front. Then let them look out!"

He talked for a few minutes more, until he felt he had solidified the reputation he and Taylor were acquiring. When the ruddy Ludman rose once more to call for a vote, the two spacemen were unanimously appointed heads of the "Terrans Protective Committee." A crude document was hastily drawn up authorizing them to act for the planters.

It developed during the next few days, however, that communications were poor among the islands. Many of the outlying planters spent part of their time undersea supervising the native Rervites working the *tohkine* beds. Some had telephone lines, but those with bases on the smaller islands could be contacted by telescreen only at intervals.

In all, about a Terran week passed while the planters gathered in New Honolulu, dribbling in by boat, by rocket, or by aircar. Ferris wore a smug look the day he roused Taylor from an afternoon nap to tell him he had finally slipped into the building where Fuller had set up an office.

"Good," approved the other. "I was wondering when we'd get some definite orders. What's he want?"

"He says he'll let us know pretty soon."

"I hope so," grunted Taylor. "It ain't so easy to keep these guys from charging over to the Lrymian settlement and starting a massacre. I had to

pop one of them yesterday to shut him up."

"I know, I know," said Ferris. A shadow flickered in his dark eyes. "I hope that slicker hasn't got any ideas about slippin' the jets an' leavin' us to explain all his talk about inspectin' Rerv IV for possible annexation."

"Aw . . . I don't think so," said Taylor slowly. "What's there in it for him that way?"

"I dunno. He wouldn't likely tell me, would he? Not *him!*"

"Didn't he say anything?"

"Well," explained Ferris, "he had this message from the Lrymians, he said. Seems they heard about his big inspection tour, an' they don't like the chances of the planet bein' taken over by Terra any more'n the planters do."

"Taxes," commented Taylor succinctly.

"Right. The way things are now, the B. S. T. gets the *tohkine* shipped to Terra duty-free because it makes so much difference in other deals. Anyway, Fuller wanted me to go see this Zrok-Tu that heads the Lrymians."

Taylor sat up straight on the hard bed.

"You ain't going?" he exclaimed.

Ferris grinned, and continued in a lower voice.

"I've already been!"

He moved lithely to the curtained doorway and satisfied himself that they were alone.

"What's the idea?" whispered Taylor fiercely, when the other had returned to perch upon the foot of the bed. "If that mob hears about this—!"

"Nobody saw me," Ferris reassured him. "I came in the other side of town and walked between the Rervite houses to the inn. Gerry, I think we have both ends of the jet plugged!"

"Yeah?" Taylor was skeptical.

"Yeah! Before I left, I let the Lrymians talk me into makin' a deal. They're willin' to co-operate to stay on Rerv IV."

Taylor pursed his lips, considering.

"We might work somethin'," insisted Ferris. "I harped on the chance of the Terran government steppin' in, so Zrok-Tu promised not to start anythin' till he hears from me."

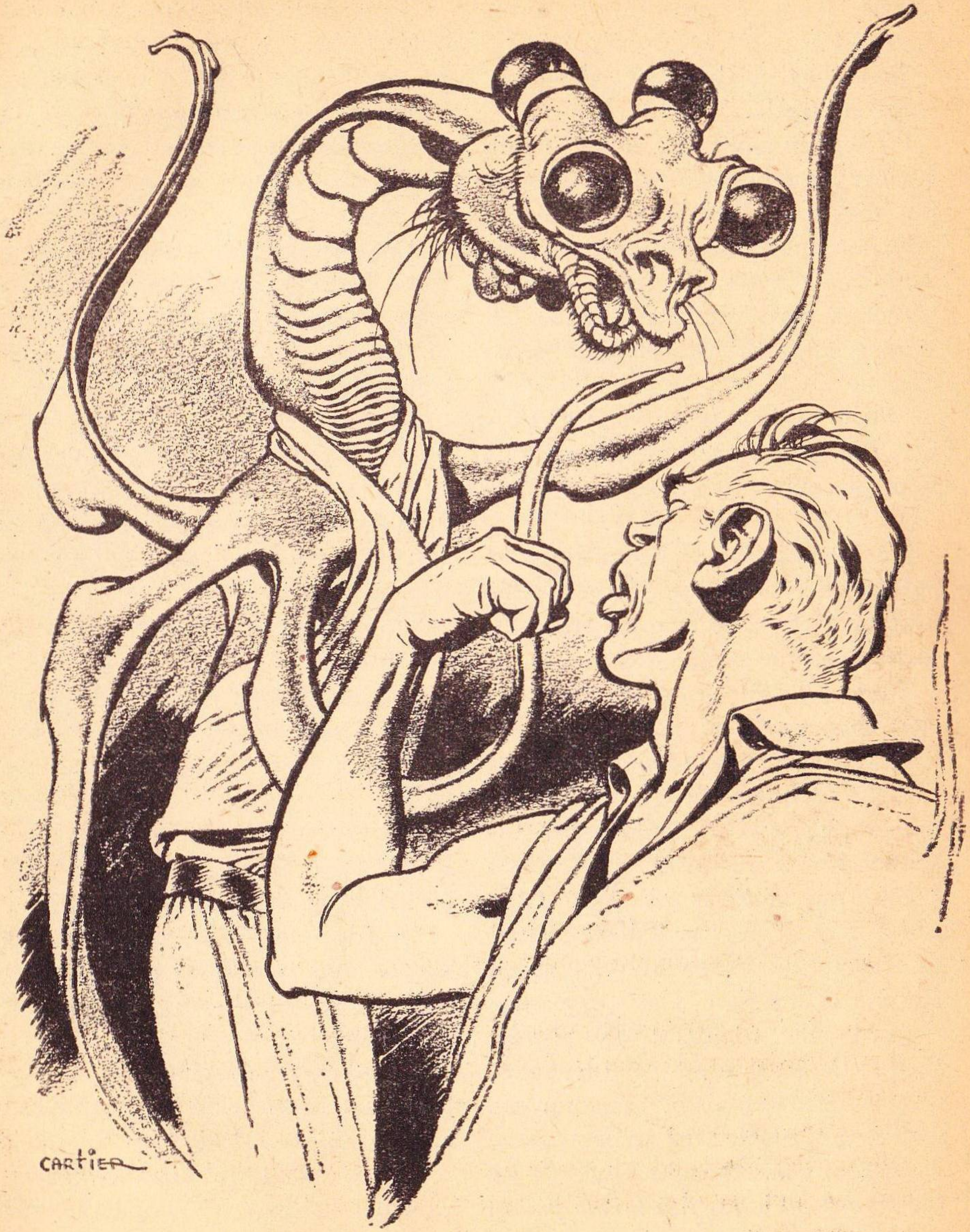
"You got promises the Terrans won't start it?" asked Taylor doubtfully.

"We got control, 'specially since we got them all to turn in their guns for safekeepin' at the ship. They all know each other from 'way back, so naturally none of them lets the others tell him anythin'. That's why we're in charge—nobody has any old grudges against us outsiders."

Taylor leaned back with hands clasped behind his head.

"I like to hear you figure the angles," he said. "Now, tell me why the Lrymians don't just send for help, too. Lryme is only a few light-years from here."

"I found that out, too," grinned Ferris. "Fuller wouldn't tell me, but


CARTIER

Zrok-Tu did. The slicker has three Terran space cruisers in an orbit around Rerv IV."

He nodded at Taylor's exclamation, and continued.

"The Lrymians are about numb for fear the annexation will go through an' they'll get sent back to Lryme without doin' what they were sent for. They must have a cheerful kind of planetary government; they're all shimmyin' to the tips of their tentacles!"

"Well, that's a relief," sighed Taylor. "Maybe Fuller can figure out some place for them to escape to."

He lay back after Ferris bounced out jauntily in search of lunch. The heat of early afternoon on Rerv IV encouraged the siesta habit.

Taylor thought of the sea that covered almost all the planet. From the Rervites he had found time to speak with, he knew something of the general topography; and he could easily understand why most of the plantations were on the inner or polar side of the island ring. This was well populated by the odd but respectably advanced Rervite civilization. The few plantations on the comparatively narrow shelf to the outside, on the other hand, were subject to raids by the voracious sea life that roamed the deeper waters.

Just the same, thought Taylor, *I bet it'd be nice on a day like this to put on a spacesuit and go under for a few hours. Hunting with those bone spears they showed me could be sport.*

Hurried footsteps in the hall roused him from his reverie. Rolling silently to his feet, he hitched his shoulder holster into perfect position. For a moment, he considered slipping on the jacket that lay on the chair beside the bed.

The curtain was swept aside and three Terrans strode angrily in. Ludman, in the lead, slowed at the sight of Taylor and peered about suspiciously.

"Ferris here?"

"No," answered Taylor, thinking swiftly and trying to keep the effort from showing in his expression. *They're onto him*, he thought. *I knew he shouldn'a gone!*

"Ain't seen him since morning," he added.

Ludman turned to the other pair. One of them, a lean, bony-faced man with lank hair, said, "He could be lying."

Their beefy leader looked doubtfully from him to Taylor, but remembered his grudging respect for the latter.

"Maybe not," he said. "Listen, Taylor, did you know your partner went out to the Lrymian settlement this noon?"

Taylor looked shocked.

"What would he do that for? What happened?" he asked.

"That's what we want to know," growled Ludman. "Would he sell out?"

"Sell out?" echoed Taylor in horri-

fied tones.

Ludman looked at him pityingly.

"We better find Ferris," he told the others. "Looks like he crossed his partner, too."

Taylor picked up his jacket and donned it to hide the dart pistol, striving desperately to think of some diversion. As he turned back to the delegation, they all stiffened to the sound of running footsteps in the corridor.

A second later, a ginger-haired Terran with splotchy freckles thrust his head through the curtains. Seeing the other planters, he was emboldened to enter.

"He's down in the hall right now, eating!" he panted. "One of the Rervites outside the hall told me he just came back."

The four looked at each other, then at Taylor, who suppressed a sigh of relief at the Rervite's ignorance of Ferris' trip upstairs.

"All right, Tim," Ludman began, turning to the bony-faced man, "you cover the back door and—"

Taylor interrupted before the strategy could become too elaborate. "I want to see him face to face right away! You fellows got guns?"

Ludman looked aggrieved.

"You guys made us turn them in so's there wouldn't be any premature accidents."

"Well, I've got mine," said Taylor. As an afterthought, he added, "Even if Ferris *is* a lot faster than me!"

The thing to do, he thought as they tramped down the stairs, *is let him know right off that they're wise to him. That way, maybe he can get out without queering the whole deal.*

Accordingly, he stamped over to the door of the dining hall in a fashion he knew would alert Ferris. He saw the latter rising from his table with one hand adjusting his neck scarf.

"The boys tell me you've been making friends with the snakes!" Taylor challenged loudly. "What's the idea? Why didn't you let me in on it?"

Ferris stared at him intently, and the big man saw the understanding dawn rapidly in the dark eyes. The planters crowding behind him must have made the situation only too clear.

"None of your business, sucker!" Ferris snarled as he whipped out his dart pistol.

Taylor dropped to the floor, tossing the planters aside with a mighty outward thrust of his arms. He heard them thudding down beside him as the string of needles went *pok-pok-pok-pok* through the woven cane jamb that decorated the doorway.

He looked up and saw that the holes were a good two feet above him; and it was with an effort that he suppressed a grin.

"Let's rush him!" grunted the man called Tim.

Taylor kicked his feet from under him as he started to rise and reached under his jacket for his own pistol.

"Stay down; he'll kill you!" he

warned.

When he thought Ferris' pattering footsteps must have reached the rear doorway, he raised himself on one elbow and shot at the wall beside it. As the gun vibrated in his hand, he saw the curtain drop loosely over the exit, so he shifted his aim to make a few holes for show.

The group rose as one and scrambled past tables and benches to the alley exit. There, however, Taylor restrained them.

"Careful how you stick your head out there!" he warned.

Ludman dropped the curtain abruptly.

"But we can't just let him get away!" he complained.

"Why not?" demanded Taylor, scowling like one betrayed. "Let him go over to the snakes! We still control all the force—if we can get out to my ship in time!"

It took perhaps three seconds for the implication to sink in, whereupon Taylor was swept out the front entrance of the inn with the rush. In response to Ludman's bawled commands, a light truck was procured in a matter of a minute and they piled in. The freckled planter drove, Taylor clung to the seat beside him, and the other three bumped around in the back.

Now I gotta think quick of a reason for not handing out the guns! Taylor told himself as the ship came into view.

When they slithered to a halt beneath its ladder, however, he discovered that he had been relieved of that problem. The bland features of agent Fuller peered down from the open port. Over the B. S. T. man's shoulder gleamed the big teeth and eyes of a pair of Rervites.

"I thought you gentlemen might possibly be along," remarked Fuller. "That is why I decided to impound this rocket and its collection of weapons."

He's not ready for the showdown, then, thought Taylor.

As he watched Fuller narrowly for some kind of hint, a nudge from behind reminded him that he must make a showing.

"You can't do that!" he retorted, feeling asinine but unable to produce any better comment in view of his relations with Fuller.

To carry the bluff through, he reached for his dart pistol, being carefully obvious about it. To his relief, Fuller moved before the weapon cleared Taylor's jacket.

"I should consider it regrettable to distribute you gentlemen all about the spaceport," said Fuller.

Taylor stared at the thick black barrel jutting two feet out of the port. For a moment, he wondered how the agent could contrive to miss him if trouble ensued; then he wondered if he *would*. Someone, mistaking his hesitation, grabbed his elbow.

"Let's get out of here!" Ludman panted in his ear. "If he lets go with one of them shells, it'll leave just a big hole where we're sitting!"

Taylor shrugged.

"All right," he told Fuller. "But don't think you can push us around for long. We have an organization."

"But not the only one," retorted Fuller. "I hear that the Lrymians are so impressed by yours that they are imitating it. In fact, there they come now."

Taylor took one look back toward the edge of the field, and ordered the driver to get moving. The battered vehicle churned up a trail of dust as it sped toward the outskirts of town.

As they approached the first buildings, through the band of bushy trees bordering the landing field, Taylor saw that the Terran planters were also gathering.

"'Bout time you showed up!" cried one as the truck squealed to a stop. "Things are comin' to a head! You fellows get the guns for us?"

Taylor shook his head and looked across the narrow road. Through the bushes, he could see the robed figures of the Lrymians massing in a clearing. Ferris was with them.

Only about three dozen of them and nearly a hundred of us, he thought, *but I wish I knew what Fuller expects.*

"What are we gonna do now?" Ludman asked.

Taylor was conscious of the silent stares of the assemblage.

He told them about Fuller and the ship. This dampened the general enthusiasm for a few seconds. Then someone pointed out that the weight of numbers should be sufficient.

"You don't get the idea," said Taylor with sudden inspiration. "Maybe Fuller will be more trouble than the Lrymians. By the way, when was the last time one of your freighters landed?"

They looked at each other in puzzled silence.

"Your rocket was the last landing," someone admitted.

Before Taylor could frighten them further, everyone turned at the sound of a hail from across the road. Taylor saw Ferris beckoning from beside a stunted tree.

"I'd better see what he wants," he told Ludman. "Maybe we ought to tie in with his gang—for the time being."

He waited until he saw enough sullen nods of assent to feel they trusted him, then walked over to Ferris.

"You an' your gun-play!" the dark man greeted him, masking a grin with his left hand. "What happened out at the ship?"

Taylor told him.

"So I said something about joining up with your Lrymians against Fuller," he concluded. "What do you suppose *he* wants?"

Ferris pondered.

"I'm not too sure," he muttered, "but it would be just like him to play

off our two gangs against each other. Or would he have some idea bout killin' two birds with one stone?"

"We oughta find a way to talk to him," Taylor suggested.

"For once," Ferris admitted, "you got something. Now, we better agree on how to put it to our mobs."

After a few minutes spent in getting their stories straight, Taylor returned to his group.

"The Lrymians are agreeable," he announced. "I didn't make any promises about later. Ferris and I figure we'd better go out and see what we can get out of Fuller."

"You going with that two-timer?" demanded the bony-faced Tim.

"You want him to go alone—and maybe get the best deal for the Lrymians?" countered Taylor.

"Well . . . no!"

"All right. Now, I found out why no ships have been coming in lately. The Lrymians told Ferris that Fuller has a bunch of Terran space cruisers stopping them a couple of million miles out."

A mutter ran through the crowd. Taylor caught several references to "annexation," uniformly followed by curses. He called for silence.

"Look—suppose he really can do it," he asked, "what are your holdings worth? At the worst, we oughta make him pay *something*. He might; it won't be legal otherwise."

"Whoever heard of the B. S. T. bein' legal?" demanded Ludman. "What we oughta do . . . well, maybe you're right, Taylor. He's got us cut off here, it looks like."

In the end, Taylor got behind the wheel of the truck, picked up Ferris, and drove out to their ship.

Fuller grinned blandly down at them as they approached.

"Stay there," he said genially. "I'll come down."

Leaving his weapon with the Rervites at the top of the ladder, he descended. On the ground, he surveyed their wary expressions.

"We're out here to bargain for both sides," Ferris told him.

"Glad you had the idea of getting together," replied Fuller. "I feared that perhaps that shooting you two did was in earnest."

"Naw, I had time to tell him where I went," Ferris said.

"Excellent!" beamed Fuller. "And when they chased you out, you *did* hire out to the Lrymians, as was reported to me?"

"Yeah, we have both sides tied up," Ferris confirmed.

Fuller smiled broadly.

"Just the sort of initiative I expected," he said. "Now, I'll tell you what the Bureau is offering—"

Three days later, he stood with them in almost the same spot in the shade of their rocket, watching the last of the planters' freighters preparing to leave with a Terran cruiser. Taylor

heard his name called, and saw that one of the stragglers had set down his personal baggage on the way to the ship. It was Ludman, so he walked over.

"Look, Taylor," muttered the beefy planter, displaying his new contract, "you sure I don't owe you anything on this?"

"Naw, I told you—I got a slice off the top. Everybody satisfied with the price?"

"Sure are!" answered Ludman. "More apiece than we'd make in twenty years. You an' Ferris musta thrown *some* bluff to keep us from bein' annexed for nothing. I don't see how that B. S. T. stays out of the red!"

"They'll nail somebody else to make it up," Taylor reassured him. "We were lucky. When I found out how well Fuller had the Rervites organized, I nearly dropped."

"Wish I knew what he offered *them*," mused Ludman. "Well, it all came out O.K. You coming with us to Terra?"

"No, Ferris and I patched things up. Fuller's letting us kick off in our own ship when you and the Lrymians are gone. They were scared to go back to Lryme II, so Fuller's sending them to Terra on that cruiser."

He shook hands with a straight face and rejoined the others.

"There *is* one thing I don't see," he remarked to Fuller as the rockets began closing their ports. "How could the Bureau afford to pay so high for those plantations?"

"It will not take as long to get it back as you may think," said Fuller. "The Rervites on their own will operate at full production instead of having the export controlled by that little cartel that was giving Terra a bad name. A small customs duty will repay the Bureau in a few years. Then, of course, we shall have to arrange for space freighters—the Rervites have no rockets of their own."

Taylor saw the gleam in Ferris' eye and was content that the hint had been caught. He went on to satisfy his curiosity.

"But why should the B. S. T. take the risk? You say you're turning the plantations over to the Rervites without keeping any control."

Fuller smiled and fingered his mustache.

"They *are* the rightful owners, so it seemed only fair to dispose of *both* invading factions. Besides, the Bureau does not care to control such things completely, as long as we retain a share of influence and . . . ah . . . good will."

"I see," said Taylor.

"Until now," concluded Fuller, "the high price of *tohkine* has been making many out-system traders unhappy during their visits to Terra. The duty of the Bureau is to keep them happy, even at the expense of a minor, somewhat dishonest crusade now and then."

THE END

DON'T WRITE: TELEGRAPH!

BY J. J. COUPLING

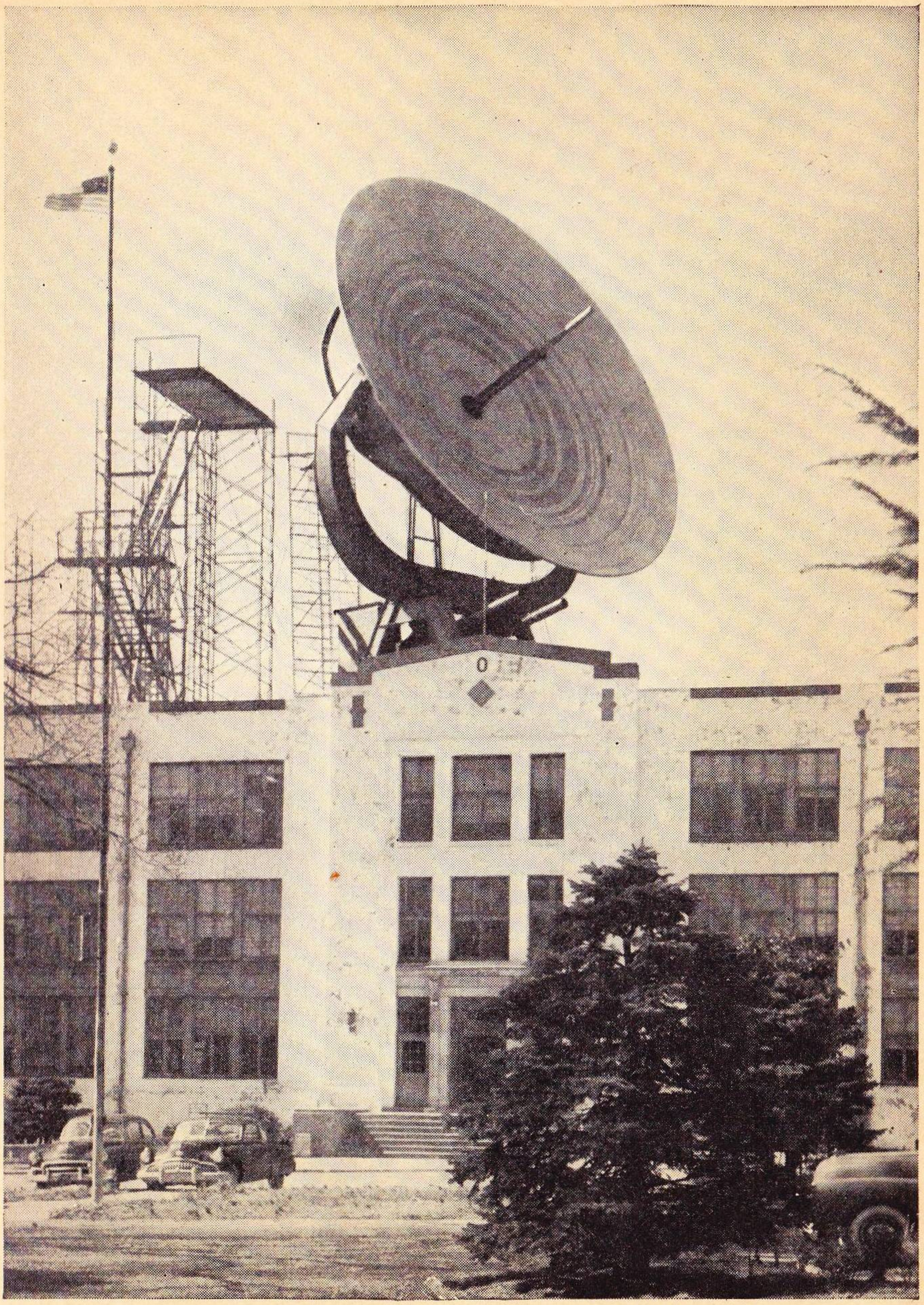
Coupling *is well known in the radio engineering field; the slight amount of power actually needed to couple Earth and the Moon, Mars—or even another star—seems incredible, but the facts are sound. A mere twenty-five watts for television on the Moon, six hundred watts—less power than a breakfast toaster!—for telephones to Mars!*

Sometimes it seems to me that science-fiction writers are eternally bent on straining at gnats while they swallow camels. Their atomic-powered rocketships easily attain a velocity near to that of light despite the fact that elementary calculations show how ridiculous this is. Thousands of feet—board feet?—of lumber are shipped to Mars by an author who seems overwhelmed at the cost of sending one letter. A janitor on the Moon can afford to exchange only an occasional telautograph (!) with his son, and so on and on and on.

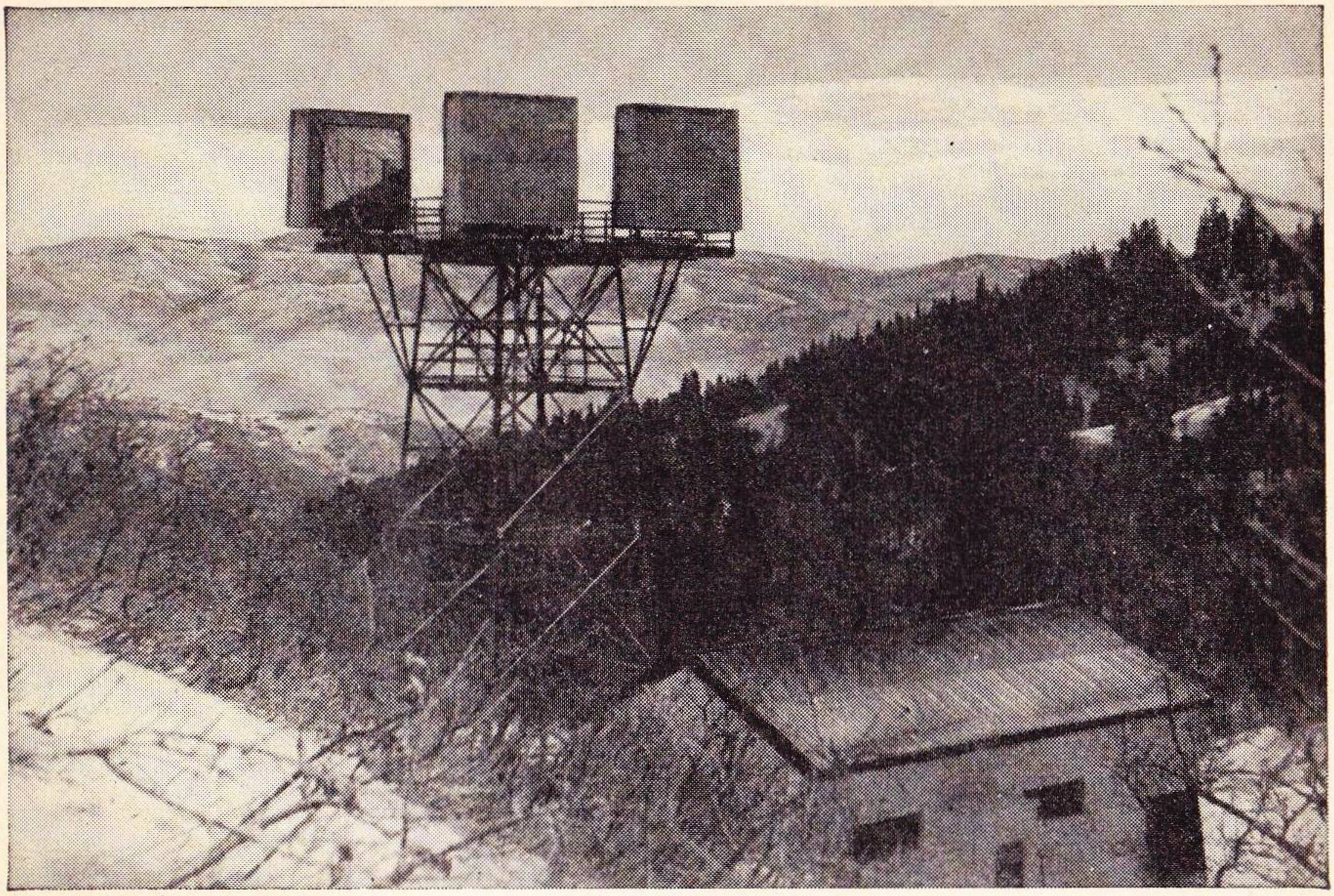
There is something strangely perverse, too, in this archaic idea of sending letters from planet to planet. Why a letter? Why carry the tradition of the courier as developed through the United States Post Office clear across space to the planets? Why waste pounds of fuel to transport costly ounces of freight, when a fraction of the energy would whisk the impalpable essence of the message planetwards at the speed of light, safe from hostile leagues or even B. E. M.'s?

And what is this heresy about Mars ships and Mars expeditions being out of touch with Earth? Why should it be expensive to communicate even with our nearest neighbor, the Moon, which is in clear sight, separated from us only by the equivalent of five miles of sea-level atmosphere and the rest

The 600-Inch Telescope. This is a telescope, and three times larger than the famous Hale 200-incher's diameter, nine times greater in area. It is used by the Naval Research Laboratary for studying the microwave radiations of subvisible and visible stars. It would, however, be better than needed for telephony to the Moon, but about right for the Earth-Mars circuits, though about half the size needed for Earth-Alpha-Centaurus telegraphy.



Courtesy: Naval Research Laboratory



Courtesy: Western Electric News

The microwave radio relay links across the continent today require towers in beautiful, but ruggedly inaccessible spots. The blank faces of the "mirrors" are deceptive; microwaves pass readily where light is stopped.

clear empty space? Why, the Moon is even within radar range! We know of our own experience that one can wire the Pacific Coast cheaply, and this despite hazards of storm and atmosphere which would put it clean out of sight even if it weren't for the curvature of the earth.

The truth is that you could order equipment for an Earth-Moon link from any of several manufacturers. The plain truth is that any communication engineer would give his eye teeth to have the cheap and easy Earth-Moon path to span rather than the tough coast-to-coast path. The fact is that, granted a base on the Moon, transatlantic television would be a snap rather than an almost insuperably difficult problem. And some sort of radio link to Mars wouldn't be hard, either.

Perhaps readers of Astounding SCIENCE FICTION would like to know the facts about interplanetary communication; why it is easy by very standard methods at a time when even the Moon-rocket is largely wishful thinking.

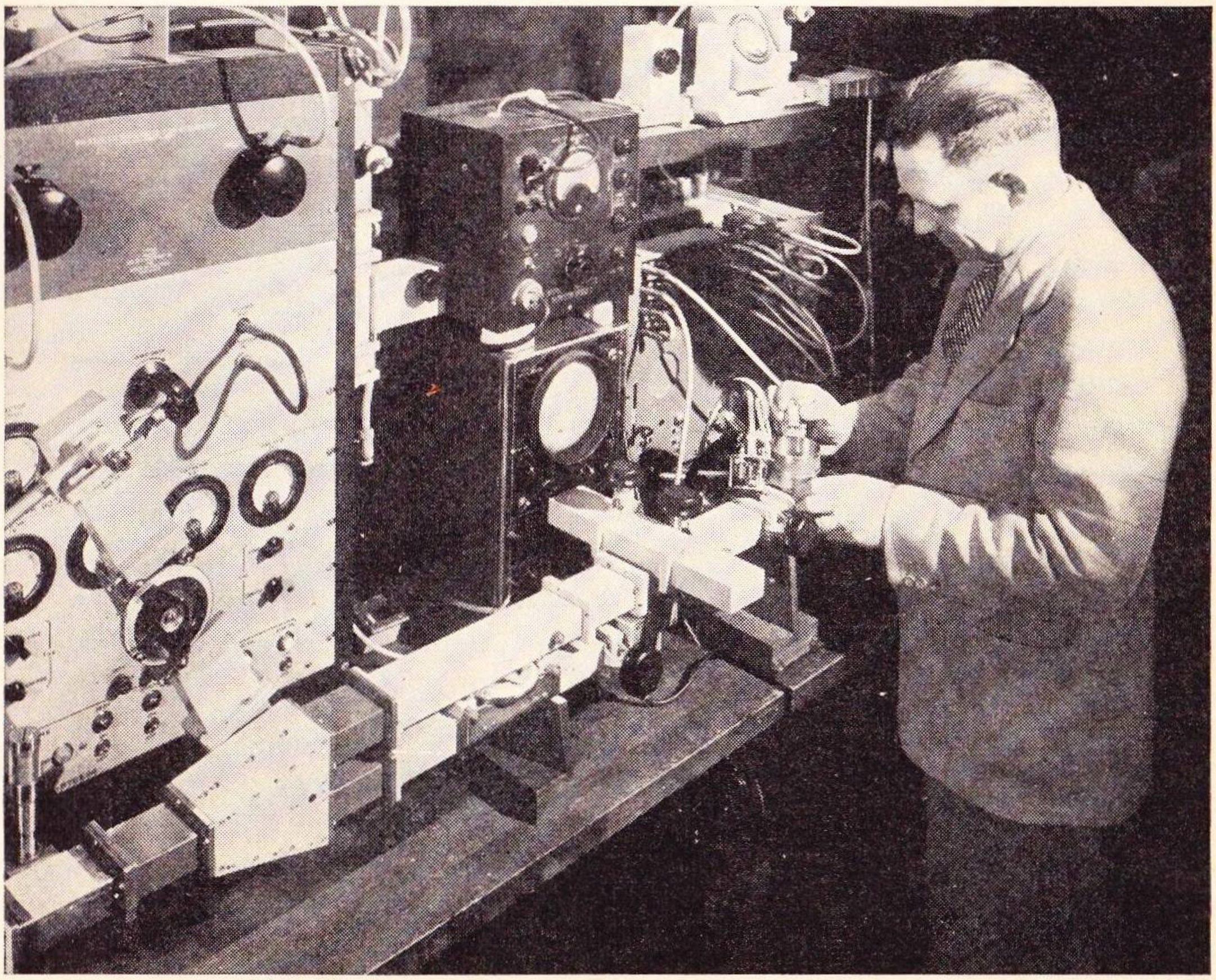
For proper orientation it is best to start with the problems of earthly communication over long distances, in

order to appreciate the advantages of line-of-sight paths through a vacuum.

How do we telegraph or talk across the continent? By wire or by radio. Now we can't lay wires to the planets, but wires are worth a thought for the sake of contrast. For instance, the most advanced and economical sort of wire communication makes use of the coaxial cable, in which about six hundred telephone messages are sent through a hollow copper tube with a central inner wire. To span the continent, thousands of miles of this cable must be plowed into the ground. And, every eight miles a vacuum-tube repeater must be used to amplify the signal. That means some five hundred repeaters in all over the longest, somewhat indirect route. Each repeater consumes power, and each adds noise and distortion. Imagine the difficulty and cost of such a system! And yet,

Development work on microwave techniques requires the co-operation of an inspired plumber, an imaginative mechanic, a physicist specializing in quantum mechanics, and an electronic engineer. At times, a being built like an octopus having genius mentality would be useful.

Courtesy: Bell Telephone Laboratories



granted heavy traffic, coaxial cable is the cheapest form of transcontinental wire communication.

It is clear that point-to-point radio must be cheaper, for it requires only a transmitter and a receiver to span thousands of miles. Indeed, it would be, but—

Short wave is unreliable. Short-wave radio can span long distances only because the radio waves are reflected from the ionized Heaviside layer. The Heaviside layer is erratic. It changes slowly all of the time and violently during magnetic storms. Partly, changes in it can be compensated for by changing frequency in the range from three to twenty megacycles per second. Thus, in short-wave transmission one must hunt around, frequency-wise, for the best transmission. But even then one can't always get through. This is especially so in the arctic regions. Telegraph and telephone are good to South America and the South Pacific. Telegraph is good to Northern Europe but telephone is pretty unreliable and the quality is bad. Both telegraph and telephone to the arctic are unreliable.

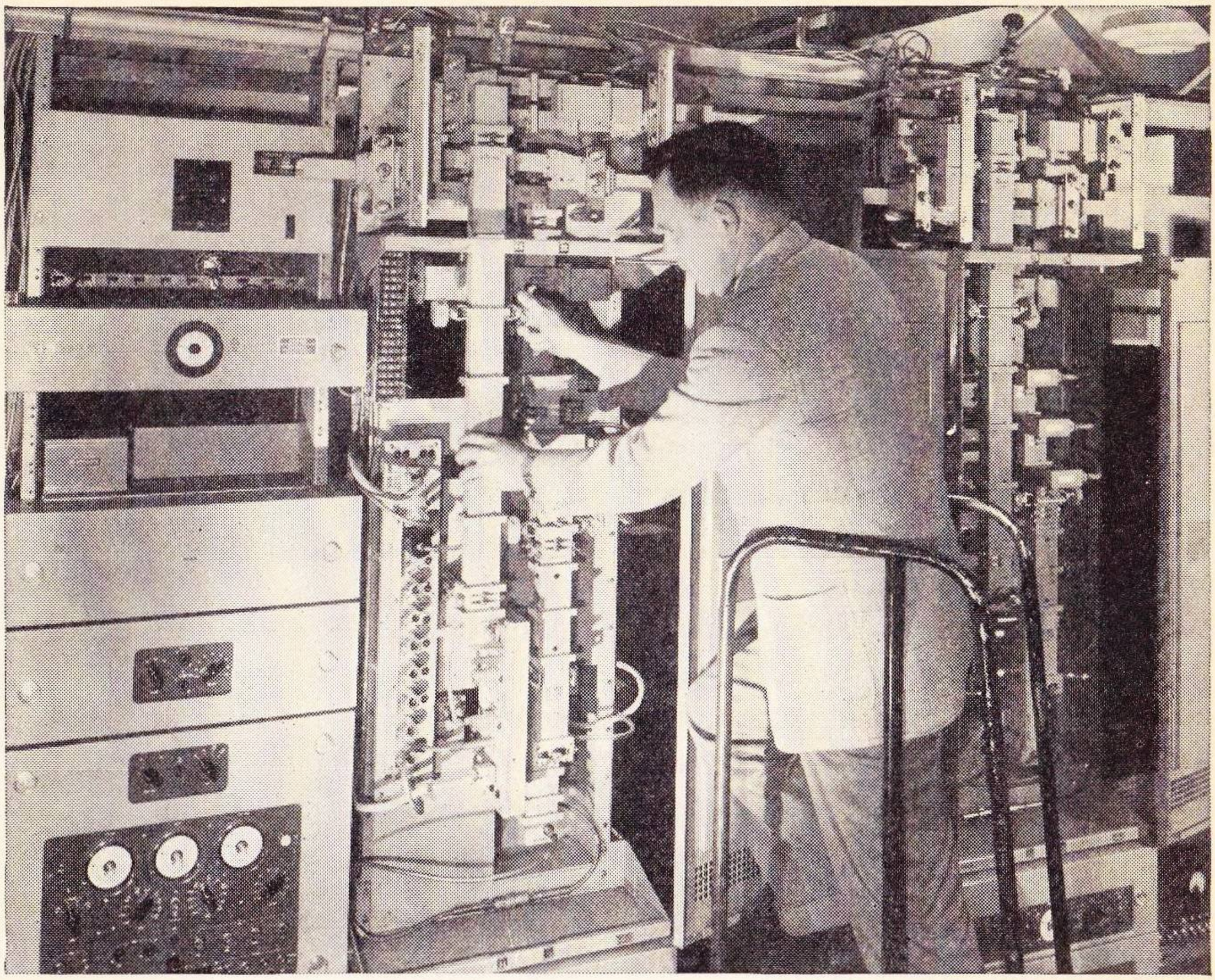
Even at the best, short-wave signals are poor enough, and they are no good at all for television.

Worst of all, the short waves are crowded. No one would think of using them when anything more reliable is available, but nothing else is available for many purposes, such as communication with ships, communication with remote locations, and telephony over oceans. And these uses mean that the short-wave band of frequencies is severely overcrowded.

Besides wire and short waves, we have a newer art of earthly communication: microwave radio. Microwaves are unaffected by the Heaviside layer —the "ionosphere" to moderns— though on calm summer nights they are sometimes seriously disturbed by stratified atmospheric layers lying over the earth, and they can be attenuated by rain. But largely, microwaves travel in straight lines, right through rain, fog and storm. In going across the country, the American Telephone and Telegraph Company's transcontinental microwave radio relay system uses one hundred seven hilltop relay stations, each in sight of its neighbors about thirty miles away.

Microwave radio is probably the cheapest way to get television from coast to coast, but what disadvantages it has here on earth!

Because line-of-sight paths are needed, one can go only about thirty miles on the average, and there one must supply an expensive repeater station, complete with a-c power and with standby generating equipment as well. And, because one must have one hundred seven repeaters to cross the country, each adding an equal share of noise to the signal, the power transmitted at each must be one hundred seven times that needed to span a single link.



Courtesy: Bell Telephone Laboratories

Checking actual microwave relay equipment installed in service. Anyone who has aligned a radio receiver, or seen it done, can appreciate the problem of aligning, tuning in, and matching up scores of relay stations scattered across a continent.

Further, the combination of atmospheric conditions and reflections from Earth, or atmospheric conditions alone, for that matter, cause fading of the signal, and also around a hundred times the power which would otherwise be needed must be transmitted to allow for this.

Despite the curvature of the earth, which necessitates many repeater stations, each adding its share of noise, and despite the fading caused by the presence of our atmosphere, coast-to-coast television and telephone communication are being carried out by microwave radio.

Now, as a rough guide it is interesting to know how much power is required at the transmitter of a microwave radio repeater in a system of the type described. Remember, the power is increased by a factor of around one hundred to allow for noise in other

links, and by another factor of around one hundred to allow for fading. Yet, the power required is—half a watt! It is this ridiculously small power requirement that gives hope for interplanetary communication by microwaves.

Communication beyond Earth is difficult almost solely because of distance. For microwaves our atmosphere —the equivalent of five miles at sea-level pressure—makes little difference. The usual sources of fading interfere with horizontally-directed rather than vertically-directed signals. The amount of rain seen looking upward is probably never enough to seriously affect a signal of wave length longer than two centimeters, and atmospheric absorption is certainly negligible at wave lengths longer than this. Hence, for wave lengths in the usual microwave range we have only distance to consider.

Distance comes in three distinct steps: the distance to our Moon, the distance to the planets, and the distance to the stars. A microwave signal spreads out through space as a conical beam with the point at the transmitter. Thus, as the signal travels its power is spread out over an area which increases as the square of the distance traveled. Hence, the power required varies as the square of the path length between transmitter and receiver. We can easily evaluate the relative powers required for various paths, taking the Earth-Moon path as a standard of comparison. Table I gives the answers:

TABLE I

Communication to:	*Distance, millions of miles*	*Relative power*	*Time of travel*
Moon	.239	1	1.3 sec
Mars, conjunction	35	22,400	3.1 min
Mars, opposition	144	363,000	12.8 min
Alpha Centauri	2.5×10^7	1.1×10^{16}	4.3 years

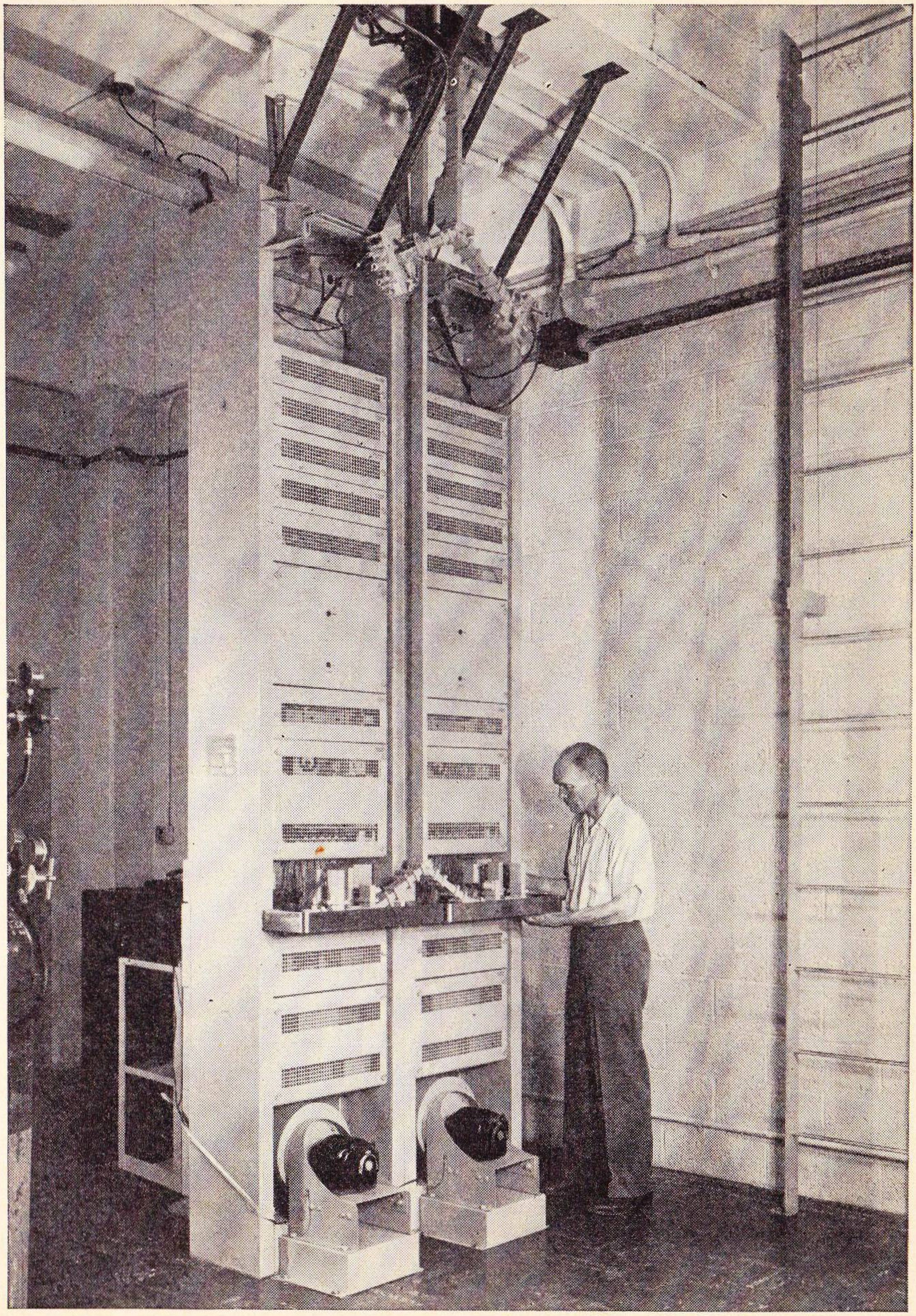
In Table I, 1.1×10^{16} means that the number 1.1 should be multiplied by the number, 1 followed by sixteen zeroes, or 10,000,000,000,000,000.

The data in Table I must be supplemented by other data: how much power do we need at the microwave receiver, and what fraction of the transmitter power is received?

The power needed at the microwave receiver is dependent on two things: the noise received along with the signal, and noise generated in the receiver itself.

A bright light near the sun would have to be very bright indeed to be seen. Similarly, a microwave transmitter near a very hot star would suffer interference from the microwave energy radiated by the star. As it happens, however, the chief source of noise in microwave transmission is

Servicing a bay of the microwave relay equipment. With but slight modification, this equipment could maintain full telephonic communication with Tycho Station Number 1, Luna! ▶



Courtesy: Bell Telephone Laboratories

the noise generated in the receiver. If a highly directive receiving antenna were pointed directly at our sun, the noise received would just about equal the noise generated in a good microwave receiver, and noise received from other parts of the heavens is negligible in comparison. Hence, we can design our microwave link on the assumption that the noise to be overcome is that generated in the receiver alone.

The noise in microwave receivers is measured by comparison with the noise which would be received if the antenna were pointed at a large black body held at a temperature 20° Centigrade or 293° Kelvin. The power P_T received from such a body would be

$$P_T = 4 \times 10 - {}^{21} \times B \text{ watts.}$$

Here $4 \times 10 - {}^{21}$ means that the number 4 should be divided by the number, 1 followed by twenty-one zeroes. B is the bandwidth measured in cycles per second.

By the exercise of the sort of care which would be appropriate in designing an interplanetary receiver right now, a receiver could be made which would generate only about ten times this "thermal" noise. Hence, the noise power to be overcome by the signal can be taken as approximately:

$$\text{noise power to be overcome} = 4 \times 10 - {}^{20} \times B \text{ watts.}$$

To go further, we need to know two things: the bandwidth needed for the type of communication desired, and the signal-to-noise ratio, or, the ratio of signal power to noise power, which is required. A pretty definite figure can be given for the bandwidth, but the required signal-to-noise ratio is a matter of engineering judgment. Table II isn't too far astray, however.

TABLE II

Type of communication	*Bandwidth in cycles per second*	*Signal-to-noise power ratio, times*	*Power required at receiver, watts*
teletype	170	100	6.8×10^{-16}
telephone	4,000	10,000	1.6×10^{-12}
television	4,000,000	10,000	1.6×10^{-9}

The other figure required is the path loss, or the ratio of power received to power transmitted.

Microwave antennas are large reflectors or horns which receive power over a rather large area and guide it to the receiver. Clearly, the larger the receiving antenna, the greater the fraction of the transmitted signal which is received, regardless of the wave length used. Thus, the larger the receiving antenna, the less the path loss, and the less the transmitted power which is needed.

Increasing the size of the transmitting antenna, horn or reflector as it may be, narrows the width of the conical beam of microwaves which the transmitter sends out and hence increases the strength of the signal at the receiving antenna. Thus, the larger the transmitting antenna the less the path loss.

When both of these effects are taken into account it is found that the ratio

of power received, P_R, to power transmitted, P_T, is given by a very simple expression:

$$\frac{P_R}{P_T}=\frac{A_R \times A_T}{\lambda^2 \times d^2}$$

Here A_R and A_T are the effective areas of the receiving and transmitting antennas, λ is the wave length, and d is the path length, all measured in the same units of distance. We know the distance to the Moon, but how are we to choose A_R, A_T and λ?

Clearly, we want to use big antennas, but how big can we make them? The biggest microwave antenna made so far is the radio telescope at the Naval Research Laboratory, a parabolic reflector fifty feet in diameter, with an area of one thousand nine hundred sixty square feet. Antennas aren't perfect for a variety of reasons, and the effective area of this antenna would be only about half the actual area: say, one thousand square feet. Certainly, a larger antenna could be built, but just as certainly, an antenna with one thousand square feet effective area is a present-day fact, and we are conservative in assuming this area.

What about wave length? Clearly, the shorter the wave length the less the path loss. However, it is hard to make transmitting tubes for very short wave lengths. A wave length of three centimeters or 0.1 feet is a nice compromise, for this is about the shortest wave length for which tubes giving hundreds of watts of continuous power have been built. Assuming, then, transmitting and receiving antennas of one thousand square feet effective area, a wave length of 0.1 feet, and a distance of 0.239 million miles or 1,260 million feet, we obtain for the ratio of transmitted power to received power

$$\frac{P_T}{P_R}=1.6\times 10^{10}$$

Because we know the antenna diameter and the wave length, we can also calculate the angular width of the microwave beam sent out by the transmitter. This is approximately,

$$\text{angle in degrees}=\frac{6.7\times\lambda}{W}$$

Here W is the width of the antenna. For an antenna fifty feet wide and for a wave length of 0.1 foot, this angle is 0.13 degrees. As seen from Earth, the Moon subtends an angle of about 0.52 degrees, and Earth, as seen from the Moon, subtends an angle of about 1.9 degrees. Thus, in communication between the Earth and the Moon, the radio beams employed would cover only a part of the Moon and of Earth. In communication with planets and with more distant objects, however, the beam would cover a whole planet.

We have still not determined the power required to send a message anywhere. To get the transmitter power required for a Moon link, we need only multiply the power figures of

Table II by 1.6×10^{10}. This gives the powers listed in Table III.

TABLE III

Power for Earth-Moon link, 3 cm wave length, 50 foot antennas

Type of communication	*Power in watts*
teletype	10.9×10^{-6}
telephone	25.6×10^{-3}
television	25.6

From Earth to the Moon with ten millionths of a watt? Isn't there something a little unreasonable about this? As a matter of fact, there is. The figures given are based on what is called single-sideband transmission. At microwaves, such transmission is very difficult and perhaps impossible at present for bandwidths as narrow as the one hundred seventy cycles per second assumed for teletype. The point is, however, that no one would think of trying to use single-sideband transmission unless he simply had to. In any case, no one would think of setting up a fifty foot antenna and feeding it with only ten microwatts. He would probably choose to use at least ten watts, which should be a small amount of power even on the Moon.

The figures for telephony and television are not optimistic although they are based on single sideband transmission. For instance, a high-deviation frequency-modulation system would require even less power than the narrow-band single-sideband system which I have assumed. Thus, ten watts would be enough for four hundred independent telephone channels. Actually, it would do for about four thousand telephone channels, taking into account the fact that talkers talk lower than peak loudness or are silent most of the time. As each telephone channel can, according to present-day earthly practice, carry eighteen teletype channels, ten watts could provide seven thousand two hundred teletype channels between Earth and the Moon—teletype talks loud all of the time.

What about communication to spaceships? Assume that we have a fifty foot antenna on Earth and use only one watt of power on the spaceship. This means we would have forty times the power we need for telephony with a fifty foot antenna on the ship. We can cut the antenna area down to 1/40 of that of a fifty foot antenna, giving an antenna diameter of eight feet. Or, with ten watts of power we could do with an antenna 2.5 feet in diameter!

What would a reasonable Moon link cost to operate? This is a very iffy question which we can tackle only by the method of unwarranted assumptions. We will consider a very unfavorable case, that in the early days of Earth-Moon communication, when the traffic is light. We will consider only the cost of transmission between a central point on Earth and a central point on the Moon.

Even in this simple case it will be hard enough to estimate costs on

Earth, but what about costs on the Moon? For no particular reason I shall assume that everything on the Moon costs nine times what it does on Earth. This will make the total cost ten times the cost attributable to the Earth station and its operation alone.

What, then, about the Earthside cost? Suppose we design our system for one telephone channel or for eighteen teletype channels. If we use ten watts transmitter power at each end, the antennas at each end have to be only ten feet in diameter. I think that there are companies which would build an appropriate station for one hundred thousand dollars or less, but suppose that we assume it to cost a half a million dollars. We will assume depreciation over a ten-year period, and this and interest will amount to about seventy-five thousand dollars a year. Another twenty-five thousand dollars should certainly take care of maintenance and operation. Thus, the terminal itself might cost one hundred thousand dollars a year.

How many words can we send for that money? We will be in sight of the Moon twelve hours a day, or four thousand four hundred hours a year. Although teletype is usually operated at sixty words a minute, a single teletype channel can, when tuned up properly, carry one hundred words a minute or six thousand words an hour, and hence about twenty-six million words a year. With eighteen channels available we can send about four hundred seventy million words a year, and the cost for the Earthside station is thus 0.021 cents per word. Allowing for a total cost of ten times this, the total cost of transmission comes out to be less than a quarter of a cent per word. The cost of *transmission* of a four hundred word letter would be less than a dollar.

How much more would sending the letter cost? That depends partly on handling charges, partly on profit, and partly on considerations with which I am totally unfamiliar. On Earth we could assume that messages might be mailed or telegraphed to some central point. At the Moon the cost of gathering and distributing messages might be higher. But at any rate, the actual cost of transmission is rather low. And, it is as high as it is only because the traffic assumed is ridiculously low by Earth standards, and because costs on the Moon were assumed to be nine times as high as costs on Earth.

What about Mars? From Tables I and II we can calculate the powers required, and these are given in Table IV:

TABLE IV

Power for Earth-Mars link, 3 cm wave length, 50 foot antennas

Type of communication	*Power in watts, conjunction*	*Power in watts, opposition*
teletype	.24	4.0
telephone	570	9,300
television	570,000	9,300,000

The power required for a single

telephone channel at conjunction is about that which has been produced at three centimeters wave length; the other powers are larger. Use of preferred methods of transmission such as high-deviation frequency-modulation, and other expedients, and the use of larger antennas, would reduce the power required somewhat. I think that we could probably make a telephone link to Mars at opposition now, but television will have to wait for further advances, of which there should be many by the time we get to Mars.

Telephone users will have to wait, too, in a different sense. Even at conjunction, you wouldn't hear the last of the other party's words till 3.1 minutes after he stopped speaking, and it would thus be 6.2 minutes after his last word before he would hear the first word of your reply. This makes telephony as we know it impractical. But, one-way voice communication, such as radio broadcast, is practical. So is teletype. If we allow a little time for development, communication with Mars shouldn't cost much more than communication with the Moon would now. You see, what is required is not more links nor more wire, but only a little more power, a little shorter wave length and a little larger antennas. And I think that with reasonable powers one will be able to communicate with a spaceship all the way from Earth to Mars. At least, that certainly seems nearer than getting to the planet does.

What about the stars, which are so very much farther away? If we multiply the 10.9 microwatts of Table III, for a single teletype channel to the Moon, by the factor 1.1×10^{16} from Table I, we reach the gloomy conclusion that it would take 10^{11} or one hundred thousand million watts to send a teletype message to Alpha Centauri. This is a ridiculous amount of power, even for someone capable of making the journey.

Maybe, however, we are expecting too much. Or, are we being unduly pessimistic? There is a long time for further research before men reach the stars. Let us sweep mere technical difficulties aside. I think that doing this will actually give us the truest picture, for our understanding of what is theoretically attainable in a communication system goes considerably beyond our guesses as to what we can now do in a practical way, let alone what we will be able to do in the near future. What is theoretically attainable is all written out in a book, "The Mathematical Theory of Communication," by Claude E. Shannon of the Bell Telephone Laboratories and Warren Weaver of the Rockefeller Foundation. In fact, it is contained in a simple formula:

$$R = B \log_2 \frac{(P_S - P_N)}{(P_N)}$$

Here R is the rate at which information can be transmitted, measured in

bits per second, B is the bandwidth of the system measured in cycles per second, P_S is the signal power and P_N is the noise power.

What shall we take for noise power? I see no reason why a microwave receiver need generate any appreciable noise at all, and granted a few thousand years of research and development, why not assume that the noise received is just that radiated from the contents of space: stars, dust and all? I seem to remember that the temperature assigned to space is about four degrees Kelvin, or only 4/293 of the reference noise temperature referred to earlier. Let us assume a bandwidth of ten cycles per second. Then, we may take as our received noise power

$$P_N = \frac{4}{293} \times 4 \times 10^{-21} \times 10 =$$

$$5.5 \times 10^{-22} \text{ watts}$$

Let us assume that the received power is just equal to the noise power, so that P_S is equal to P_N. Thus, we know the power which we need at the receiver. And, for $P_S = P_N$, the information rate R is just equal to the bandwidth B.

In order to arrive at the required transmitter power, we need to know the antenna area and the wave length. Surely, out in space, free from the pull of gravity, antennas with a diameter of one hundred feet seem conservative. And, let us make only a small advance as far as wave length goes, and assume a wave length of one centimeter.

With these assumptions, we find that the ratio of transmitter power to receiver power must be 1.2×10^{24}. Thus, the transmitter power must be this number times the number of watts required at the receiver, which is 5.5×10^{-22} watts. Or, we need a transmitter power of only six hundred fifty watts!

To me, this seemed nothing short of astonishing. Of course, I might have underestimated the temperature of space a little, but that couldn't make much difference. Had I neglected anything? What about quantum effects?

Energy comes in little discrete packages, and the energy in each package, measured in joules, is 6.62×10^{-34} times the frequency of the radiation involved. The frequency of a radio wave of one centimeter wave length is 3×10^{10} cycles per second. Hence, the energy per quantum is 2×10^{-23} joules.

Now, we assumed that our receiver receives 5.5×10^{-22} watts of power from the transmitter, and that it receives ten bits of information a second. This means that there are only 5.5×10^{-23} joules per bit, and this in turn means that there are only between two and three quanta allotted to carry one bit of information.

Certainly, quantum effects put our system right on the borderline, and probably six hundred fifty watts won't be enough to signal to Alpha Centauri at a rate of ten bits a second with the

system described. Maybe we'll need a whole kilowatt to go those 4.3 light-years!

So far, we know that with an essentially ideal communication system using one hundred foot antennas and a wave length of one centimeter, around a kilowatt should enable us to send ten bits of information a second to Alpha Centauri. With a very crude form of encoding, this would send two letters a second, 0.4 words a second, or twenty-four words a minute. With a more efficient form of encoding it might be possible to triple the rate and send about seventy-two words a minute. This should serve to while away the tedium of an interstellar expedition.

Could we do this right now? No! We don't have the noise-free microwave receiver described. We don't know just what sort of modulation and encoding to use. We don't know how to receive a signal at noise level, with a bandwidth of only ten cycles per second, and that despite a large doppler shift of frequency due to relative motion of transmitter and receiver. But, we don't know how to reach Alpha Centauri now either, and that with a lot more emphasis. The difficulty will be in getting to the stars, not in telegraphing home about it!

THE END

PUZZLE FOR THINKERS

Take the statement: "It is extremely dangerous to bring two pieces of metal together; under certain conditions they explode with appalling violence."

This statement is absolutely *true in fact;* bringing together two pieces of U-235 confirms beyond question the factual validity of the statement.

But the statement is completely *false in implication.*

Puzzle: Define in detail the process of thinking about a statement that makes this true-in-fact statement false-in-meaning.

That it *is* false in implication is agreed; that it can be demonstrated to be false in meaning is agreed. That's not the problem; the problem is to develop a logical test procedure which can be used to test a true-in-fact statement and determine whether it is false-in-meaning—when the fact that it is false in meaning is *not* obvious!

Second puzzle: How many of the true-in-fact statements you are currently accepting as true-in-meaning are in fact false-in-meaning?

J. W. C. Jr.

NEXT DOOR

BY JACK THOMAS

If there are *parallel universes, the really unpleasant feature of them would be that they were so similar — so almost-but-not-quite!*

Fortunately for the occasional martyrs to science in the Physics Lab, the university clinic is not far. Three dormitories north; one gymnasium east; up two flights of stairs. And since, according to Minkowski, Space and Time have vanished at the touch of Einstein's probing pencil, with only a curious blend of the two retaining any reality, it must be added that the attempted passage of Bill the Conqueror is now five minutes distant—

"Wider, universe hopper."

Eyelids clamped shut, mouth strained open, the boy in the dentist's chair feels the cool thrust of the hypodermic knitting in and out of the sea of fire in his left jaw. Hears:

"All right, Bill. Relax."

And groans in agonized dismay.

"Calm down," says Dr. Zeitgeist. "It'll be . . . uh . . . say fifteen minutes or so before we're ready to pull. By that time you should be numb to the armpits."

The voice of the patient's parent—and department head—is heard in our land: "To the armpits? That nincompoop has been numb to the knees"—*wheeze*—"since birth—" The voice dwindles into a great shuddering gasp. Pop is an endomorph, "fat and short o' breath." Not the man you'd pick to half drag, half carry a slightly damaged sophomore a couple of hundred yards on the dead run.

"Easy now, professor," says the dentist. "Let's not inflict more damage on our universe hopper."

"Inflict more damage? Do you realize that this mongoloid idiot almost wrecked the cyclotron?"

Bill, his ears now as superheated as his tooth, hears the tinkle of glasses; the chuckle of liquid.

"Try this professor. A real find. Got it from an unfrocked St. Bernard."

A moment's silence in honor of Art.

"Universe hopper," continues the dentist thoughtfully. "I hope this isn't a pet name you physicists have for your wretched apprentices. At face value it's the most promising indictment I can recall since the Snark was lawyer for a pig accused of deserting its sty!"

The sound of drawers being opened.

"The last—and until now the only—person to come in here with a melted filling was that daffy instructor over in engineering . . . whatzisname . . . Tilghman? Tugman? Something like that. Had his head in an induction furnace—he said. A dull and disappointing explanation. If a plausible one."

The clank of dread instruments being arrayed on a tray. "A soon as you resume metabolism, professor, you'll probably disillusion me. Meanwhile, from what I've heard so far, I shall cherish a vision of Bill gnawing his way through cosmic barriers and becoming overheated in his haste."

This universe? Or one — next door?

Bill, his pain subsiding, opens one eye to the surgical white of the ceiling. He opens another. He pauses, testing various muscles. No third or fourth eye responds. This body, then, is at least roughly similar to the one from which his mind has been projected. The odds are, of course, that the similarity extends to an atom-to-atom correspondence.

The natural disappointment at this realization is tempered by the happy thought that it is quite a feat to resume scientific thinking so quickly. As L. Springe de Tamp would no doubt put it, "The Scientist in him triumphed over the wounded animal."

The thought of the Master reminds him to perform his cortico-thalamic pause. Which he does, hastily, noting in passing that no extra brain goes into action. Then he resumes research.

The mirror over the chair shows the same old face: Pug nose and freckles topped by carroty hair. The jaw is swollen of course, and he is a bit green around the gills.

A glance at the others shows Pop, exactly the same down to the gravy spot on his tie. Except for his complexion, a ghastly ash-color from fright and exhaustion. Bill recalls seeing healthier faces bottled in formaldehyde. Doc Zeitgeist, on the other hand, still looks like an ad for a health resort, his face tanned beyond blush or pallor by years of golf.

Through the window, Bill sees, unchanged, that unique campus which critical architects have described as being the work of cowboys. Who but cowboys on a holiday, they ask, would round up a herd of Gothic cathedrals and corral them in an elm grove?

The sight is not only aesthetically but scientifically depressing. This prairie R'lyeh, this cornbelt Commoriom, has, after all, a very tenuous basis; a few aberrated cells in the brain of an oil billionaire. It exists, no doubt, in only the nearest few millions of universes—a very small arc of the great wheel of Phenomena. In a cosmos at any distance in the fifth dimension culminating change sees that the corresponding Croesus in each would have a slightly different screw loose. This would result, say, in a campus of Parthenons; or, further out, a dog and cat hospital housed in Chinese pagodas.

Bill leans back once more, shuts his eyes. Somber thoughts begin trickling through the mind of the tired and worldly-wise scientist. Thoughts that would never have occurred to the bright-eyed optimistic youngster of an hour before.

Why hadn't he seen the colossal odds against success? Oh, he has moved; the terrific push on his mind was not to be mistaken. His body has been shoved around a little, too. But it is overwhelmingly probable that the present space-time continuum isn't far enough from his original one for any change to be spotted.

That fool wheel of phenomena! One electron's difference between one cosmos and the next! A man's mind would have to pass through zillions of them to arrive in one where his body there had one additional hair on its head. And maybe that additional hair wouldn't be growing on him. It might be in the long gray beard of a BEM on a planet in Andromeda. Or on a furry plant ten million light-years out in the supergalaxy in Coma Virgo. Or on something somewhere in the ninety-nine point nine of the universe beyond the reach of molded glass at Mount Palomar. What a case for an Arisian Sherlock Holmes!

For a hair—somewhere—one almost gets electrocuted. Undoubtedly there is a segment of the Wheel, many successive Continua, where Bills did get fried. Maybe—an icy chill went through him—he had left a charred body behind for his own, his real folks to bury.

It wasn't at all likely. The few million universes he had probably tra-

versed were different only by the same few millions of electrons. Even if all these electrons had been concentrated in the current between him and the cyclotron, they wouldn't be enough of an addition to make it lethal. No, not his folks. Trillions of parents would have sons to bury but not—

But weren't they all his folks? Didn't the entire class of Bills—as far along the Wheel as conditions were enough alike to produce them—didn't they, when migrating in unison, somehow assume responsibility for the parents, cyclotrons and bodies of all? He begins to suspect that heeding the fall of a sparrow might not be so difficult, after all, when that fall starts a wave of anguish rolling through innumerable universes—

He decides that he'd like to have seen Aquinas go to the mat with that problem; meanwhile he'll "think about that tomorrow." Events and ideas are indeed getting out of hand. The script has more of the somber touch of that distinguished journalist, Dmitri Karamazov, than it has of the sprightly and engaging style of the great L. Springe de Tamp. Not that the latter master had not warned, clearly and numerically, of the difficulties of dimension traveling:

"Our hero, Robert Fernsgirth, would have to pass through a fabulously great number of space-time units before he arrived in one which was strikingly different. Different because billions of years before a few atoms had zigged instead of zagged; subsequently large portions of the world had evolved down somewhat divergent lines.

"Remote indeed would be the cosmos where his trusty whipcord riding breeches would have become pseudo-Roman kilts and armor, and he would be Roh-ber, a bronzed laughing giant, sword always ready in defense of Princess Liederkranz of Hyperbola. Where, raygun in hand, he would stalk Ching the Choiceless, Mad Emperor of Uranus, down a neutronium corridor into the heart of the Sun.

"Even more remote would be the sector where the saucer-eyed primate, Rob, would hang by his tail and watch silently while the flat-tailed, hairless beaver sapiens passed below his tree, express rifles under their arms.

"The fabulousness of the fabulous number of intervening universes? To begin construction of this titanic figure, take a googol—the integer one followed by a hundred ciphers. Or if you were born too lazy to write out all those zeros, i.e. a mathematician, make it 10^{100}.

"And before proceeding with the job, paste this in your hat: Sir James Jeans once estimated the number of subatomic particles in the universe to be about 10^{79}. Our googol is a thousand million trillion times as big as that little number!

"Now for the second step. Raise a googol to the googolth power. Not

multiply—a googol squared is only 10^{200}. Above and to the right of what you have already written, in the power seat, put a one and tag another hundred zeros after it. You lazy math majors make it 10^{10000}. This is a googolplex.

"Unless you've got lots of spare time, don't try writing this out in full. If Betelgeuse—or a real celestial fattie such as Alpha Herculis or Epsilon Aurigae B—were hollow, you could fill them with paper zeros of this type-size like filling a glass jar with doughnuts; and you'd only be beginning to write a googolplex out in full.

"This googolplex is our number. That's the quantity of universes between you and Princess Liederkranz. And the sum total of all the universes, according to Paasdertz, can be expressed by a googolplex raised to a googolplex raised to a googolplex. Don't ask Daddy to show you how to write this; he has a headache and must go down to the corner for a shot of space-sickness remedy."

And Bill became increasingly aware that Dr. Zeitgeist's space-sickness remedy has brought Pop around nicely. The head of the Physics Department is addressing his miniature audience in his normal tone, a sonorous bellow:

". . . The apparatus is set up. The induction field that melted his tooth and smaller metal objects was produced by the bank of tubes. It's a miracle he wasn't electrocuted. No one with the brains nature gave a louse would have tried anything of the sort. Of course, what do you expect from him? Even in chess he takes goofy chances. With Black he defends with the Greco-Counter Gambit or the Benoni. With White, he opens with the Spike or the Ourang-Outang. These theories of Paasdertz's are just weird enough to attract him."

Pop sighs. "It so happens that they're weird enough to make some kind of sense out of the universe. Which is more than most theories do. For the last sixty years or so physics has been the nuthouse of the sciences.

"Now, regarding the ideas behind that line-up of junk in the Lab—"

Bill heard Pop setting fire to cigarettes, taking quick nervous drags. Dental patients probably aren't allowed to smoke thought Bill, and bothered neither to ask for one or even to open his eyes to watch the tantalizing blue vapor.

"In 1903," proceeded Pop, "Rutherford and Soddy announced the 'laws' of radioactivity. These laws were merely statistical approximations. That is, given five hundred million atoms of radium, they could predict that one of these would blow up today, one tomorrow, and so on. In the same way an Insurance statistician can tell you that during the coming fiscal year three point seven three men will brain their mothers-in-law with 'The Decline of the West.'

"But which men? Not even Freud could predict that when a man blows his stack, Spengler will be handier than a brick. Likewise, there's no atomic psychiatrist who can tell when an atom of a radioactive element will erupt. Nothing—short of the desperate measure of neutron bombardment—alters the rate, quantity or quality of radiation. The age or previous condition of servitude of the atoms has no bearing. Atoms created by a breakdown of heavier elements yesterday have the identical disintegration rate possessed by the survivors of a batch a billion years old. The whole layout reminds one of the drawing of a sweepstakes ticket. There is no way of predicting the holder of the winning ticket by odds of age, sex, I. Q., or anything else. In like manner, of five hundred million absolutely identical radium atoms, under identical conditions, one, in grand defiance of the laws of cause and effect, will erupt in a blaze of energy. Another, cheek by jowl with the first, will remain stable for a billion years.

"In 1917 Einstein showed that this spontaneous combustion is a feature of all atoms, which lose and gain electron shells with the same unreasonableness as radioactive elements split their nuclei.

"Each atom in the entire space-time continuum is potentially a bust. And every atom does collapse to a certain extent at comparatively frequent intervals—without apparent nudging. The chain of cause and effect no longer works. Determinism loses not only the province of radioactivity, but the whole empire of physics. Cause and effect—not only the basis of science, but the basis of all human thought—has had the bucket kicked out from under it.

"The scientists, once actors performing on a solid stage, find themselves in the unaccustomed role of acrobats, swinging from trapeze to trapeze in midair. To be sure, they have risen to the occasion. Their greatest achievements of all Time have been performed in recent years, though they are continually shooting nervous glances at the philosophical vacuum below. The enormous mass of metaphysical and mystical drool emanating from even the top men in math, physics, and astronomy is a measure of that nervousness.

"The philosophers—especially the determinists—have been running around cut-cut-cawing like Chicken Licken after she had decided that the sky was falling.

"Recently, onto this scene of confusion rushes Dr. Eando Paasdertz of Miskatonic, carrying a large land mass which he inserts gallantly under the feet of science and philosophy. This welcome relief is his Theory of the Sufficiency of Universes.

"To get the idea, let's imagine a poker carnival of one hundred fifty thousand four-man games. Six hundred thousand hands are dealt at once.

The odds are that one and only one of these hands will be a royal flush. At one of these tables a player has just displayed his fiftieth straight royal flush. Looking at the automatics pointed at his head, he says:

"'Boys, you got me wrong. I'm not cheating. And what I've been getting is beyond the laws of chance for this many poker games. Therefore the only answer is that there are six hundred thousand to the six hundred thousandth power hands of poker being dealt all over the world at this time. And I get a royal flush every hand!'

"Paasdertz then accounts for all phenomena by postulating, not an infinity of universes, but enough. Enough so that in one or another of them every bit of matter occupies every bit of space—during every instant of time! On the chessboard, with sixty-four squares, thirty-two men, and certain limitations imposed by the opening position and the oddities of each piece's move, the number of possible moves and, therefore positions, is stupendous: 10^{500}.

"The cosmos has 10^{110} spaces of electron size, 10^{79} subatomic particles. And since the eruption of the primeval universe atom circa three billion years ago, about 10^{25} billionth seconds of time have passed. The billionth second is figured as the time an electron, at the speed of light, can move over the space of its own 'length.' Ring all the changes on these and you have the number of universes.

"Entropy is the driving force, the dealer of the hands. Paasdertz, between the equations in his book, indulges in some Shelly-like spasms over entropy. Writes of the 'Wind That Sweeps The Universes,' and has the galaxies 'spinning like windmills.'"

Pop growls his scorn of purple passages. "Anyway, these fourth-dimensional space-time units lie packed together in the fifth dimension like two-dimensional pages in a three-dimensional book. Googolplexes of them, 'closer than hands or feet.' Again, as pages in a book have a slight extension in the third dimension, so that enough of them add up to real cubic bulk, so the universes have an enormous extension in the fifth dimension in what Paasdertz describes as a 'wheel.'"

"That sounds very much like the Buddhist 'Wheel of Things,'" interrupts the dentist. "That is their description of the cosmos, the ever-changing, from which the soul tries to escape to Nirvana, the changeless peace."

Pop is noncommittal. "Maybe Buddha had something. Maybe cracks or something in the fifth dimension explain all the spooks and other supernatural phenomena people have always claimed to be seeing. Unlike the Unified Field Theory, the Theory of Sufficiency of Universes not only claims to cover gravitational and electromagnetic fields but mental fields as well."

"Wait a minute," says Dr. Zeitgeist. "You're in my backyard now. Encephalographic work proves that a brain possesses a very light but definite electrical field or fields. Wouldn't they enter, without special treatment, under Unified Field equations?"

"How then do you explain the facts turned up by Dr. Rhine in his ESP researches at Duke? A field, like radiation—gravity is the classic example—diminishes in proportion to the square of the distance. Standing here, you're four thousand miles from the Earth's center of gravity; while four thousand miles straight up you'd be twice as far. Two squared is four, therefore you'd weigh one fourth what you do now.

"ESP, the most intensively studied mental process at Duke, is not affected by distance or position. Dr. Rhine's subjects 'read' the invisible cards equally as well whether they were sitting with their backs turned five feet away or were a hundred miles away on the end of a telephone. Holding the cards edge-on toward the subject so that no known type of spatial perception would work did not change the results.

"This sharp divergence of mental fields from electromagnetic laws has been explained by Paasdertz as follows: The mind is an electric field whose main work and strength lies in the fifth dimension. Like an iceberg, its main bulk is out of sight. Again, multiple universes are the solution!"

"Isn't this the hard way?" demanded the dentist. "Creating skintillions of fourth-dimensional whatchamadoozies instead of allowing a measly little irrationality to creep into the scheme of things now and then?"

"We scientists never flinch from the hard way," says Pop proudly. "Or rather," he amends cautiously, "nature never seems to spare us. Look how tough the Copernican cosmology was to Dante's fan club. Look at the fight the Newtonians put up before they swallowed Relativity. And we'll swallow Milne, Hoyle, and Paasdertz at a single gulp as soon as the experimental or at least observational proof begins to pile up.

"Paasdertz, now, has some cute ideas as to how we could verify him experimentally. One is based upon some equations which seem to show that a cyclotron, besides its known duties, also creates a fifth dimensional field of some strength. Here's where Bill comes in. He—"

"Bill!" said the dentist. "Omigosh—the tooth! It's way overdue."

"Anyway, according to Paasdertz," said Pop, while Bill once more opened wide and the dentist had a final look-see with his little mirror, "you get a cyclotron, build yourself an improvement of the electric thinking cap they use in encephalography, connect them in such and such a manner, and whirl your mind down a hundred million universes. Look around.

"You'd see—nothing. Nothing

strange. Even assuming the gadget works. A few million, billion, or trillion electrons difference in the world about you would be unnoticeable. Before you could notice anything different, you'd break the Bank at Monte Carlo more often than a chef breaks eggs."

Through eyes opened only as slits, Bill can see the silhouette of the dentist, forceps in hand, pause. "Wait a minute," says Dr. Zeitgeist. "If Bill's mind had gone into the body of a Bill prime, x universes away, wouldn't that have put two minds in one brain? Producing insanity? Then one can never know whether or not Paasdertz is right. If you succeed in verifying him experimentally, you become one half of an attack of schizophrenia."

"You miss something," says Pop. "The googol of Bills each way from this one are all identical with ours. That means that they would do everything alike, including moving their minds the same n number of universes at exactly the same time. Even Bills very far away, with somewhat alien construction, would have joined in the great hop. Of course there is an end to the row that moved.

"The whole thing is impossible, naturally, but I'd like to believe in it. Especially I'd like to believe that part of the idea where Bills stop moving and one little piggy stayed at home, while the last of the movees paid a visit. Somewhere one brain houses the minds of two Bills. I am happy for the me in that universe. He has, alone of all those who are me, a son of almost normal intelligence. Uh, how's that molar coming, Doc?"

At least in this universe, it comes out easily, and in only two pieces.

"O.K., Bill. That's it. Spit here."

Bill spits—and suddenly his heart crawls up and tries to hide behind his palate. He spits again. Same result. He wipes blood off his mouth, looks dazedly at the sticky fingers.

"What's so unusual about the blood, Bill?" asks the dentist.

Bill looks at him—and with a start, hurriedly at Pop. He looks at both of them with mounting amazement. Then he looks at his hand—and again at their faces. The color has returned to Pop's pallid cheeks, and beneath Doc's tan is—

"Green," says Bill wonderingly.

"Well, stupid," roars Pop Next Door, "whajja expect blood to be? Blue or red or something?"

THE END

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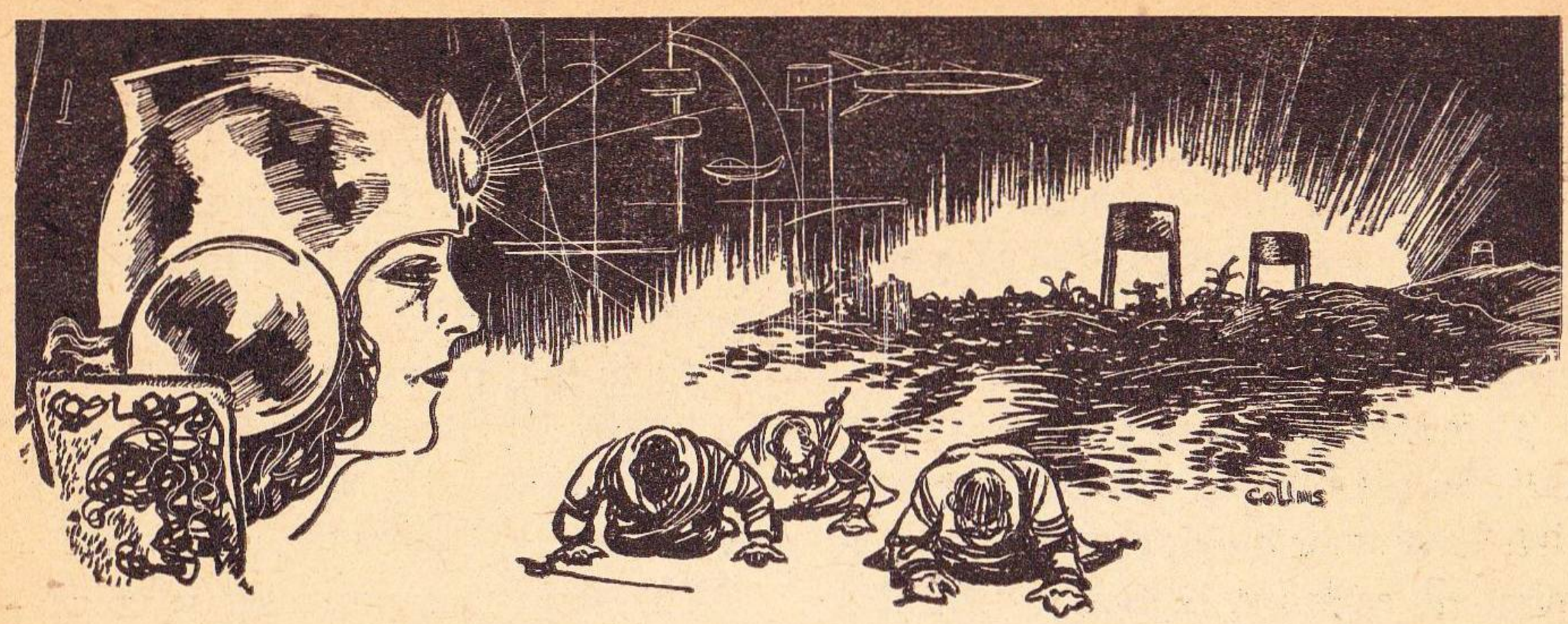


MAN DOWN

BY JACK WILLIAMSON

The world is not what it is one-half so much as it is what a man sees it to be. And we see through eyes colored by our own past. Given a very different past, on a very different planet, and a very different set of beliefs—

Illustrated by Collins

The cruise of the space yacht *Royal Mother*, out from Altair II and back again, had been arranged to kill some sixty years of time. Sixty years on that woman-governed planet—until the matriarch got ready to round out her iron-willed reign by directing the coronation and the formal nuptials of her daughter. Aboard the yacht, however, in the flux of space and time at interstellar speeds, the years had shrunk to days.

The prince had been twenty-four when the cruise began. A slim and unobtrusive man with a hesitant voice and dark curly hair, he was still boyishly engaging when he smiled, although the waiting burden of his royal duties had already stooped him slightly and sobered his blue eyes with a wistful resignation. His newly granted title was as yet unblooded; he had never killed a man.

He was expected to return un-

changed by time, still a fit consort for his future ruler—who had been a red and wrinkled infant when he left, squalling alarmingly through the betrothal ceremony. And he fully intended to return on time. He had assented without protest when his mother and Her Majesty announced the traditional arrangements. He was merely a man. He knew his place.

A faint discontent had begun to nip him now and then, however, even while the faint spark of Altair hung reddened and fading behind the ship. Moody silences began to blight the small talk expected of him at dinners and receptions on the civilized planets he visited. For all his efforts at a princely submission, rebellion smoldered in him. When the psionic screens showed him Altair turning bright and blue ahead, beyond Alpha Centuari and Sol, desperation took hold of him.

Trapped in the cold luxury of the royal suite, he tried to learn the speech his aide had written for him to make on Proxima IV, but the hollow phrases mocked him. He tried to sleep and paced the decks, until a wild impulse drove him to arouse the aide—a grizzled, hard-bitten old duelist who had fought his way to a title that can be rendered here as count.

"Call the bridge and change our course." He gulped to smooth his voice. "I . . . I want to stop at Sol instead of Proxima."

"But . . . your highness!" An apprehensive disapproval flickered through the old aristocrat's well-bred reserve. "You know the matriarch herself picked out our ports of call. She won't be pleased. And if we're late for the coronation—"

The count paused ominously, without words to convey the enormity of that, but the prince understood the danger. Other mothers had coveted the throne for their own sons, and their jealousy would surely turn any delay into disaster for him.

"I mean to be on time," he protested hastily. Afterwards, all his life would be arranged for him, but suddenly now he felt that he had to have one moment of his own.

"Why Sol?" The count spoke with the candor of old friendship. "A desert system, except for a handful of savages on the third planet—I was there with the quarantine service, before I came into the fighting class. Why go there?"

"I don't quite know," the prince admitted hesitantly. "But when I saw Sol ahead, it set me to thinking of history. The Men's Rebellion. There's a legend, you know, that the survivors escaped into space, and one of my tutors had a theory they settled that third planet. I'd like to forget speech-making long enough to investigate his theory."

"There's evidence that the migration came the other way," the bluff old nobleman objected. "Even today, some tribes there are largely woman-ruled. But you'll have to take my word for that, because they're under

the Covenants of Non-Contact. No outsiders allowed, except service undercover men."

"That won't stop me from exploring some of the desert planets, to look for traces of those exiled men."

"Perhaps not." The gaunt count shrugged and stood for a moment chewing at the yellow fringes of his luxuriant mustache, frowning sadly at the prince. "There's another reason for keeping on the safe route the matriarch selected for us. The galactic drift."

"Haven't we safety devices enough?"

"For the charted interstellar lanes. But if we change course out here—" The old man shrugged. "Who knows?"

"If you think there's too much risk for the crew, I'll give it up."

"Our lives are safe enough," the count admitted, "with all our survival devices. It's just that any collision might delay us for years, waiting for a rescue ship. We might be late for your coronation."

The prince straightened uneasily.

"If that's all that worries you, call the bridge."

"Are you out of your head?" The count scowled forbiddingly. "Risking the favor of the matriarch now, for just a whim?"

"It's more than a whim," the prince insisted. "Even if it seems an empty gesture, it's something I have to do. The only free choice, probably, that I'll ever get to make."

"I'll call the bridge — but watch yourself." The stern old nobleman lifted a cautionary finger. "Freedom is a dangerous drink for any man to sip. A deadly habit, and difficult to break."

He called the bridge. An astonished officer made him repeat the incredible command, but then the ship answered. Momentum flowed away into impalpable neutrionic energy, and came back with a new direction. The twin points of Alpha crept aside, and Sol blazed blue ahead.

On the planets, half a dozen years flashed away. The matriarch reigned, attending to the education and the travels of her daughter. The childish natives of Sol III rashly split the atom, and laughed at rumors of mysterious machines in the sky.

Aboard the *Royal Mother*, speed turned time to miles. The prince slept well again, once. He spent a day scanning the films on the planets of Sol in the ship's library. After dinner, he had several drinks with the count. Listening to the old man's tales of desperate undercover missions, he forgot his own stern future for a time. He went to bed again.

He was sleeping when it happened.

Neutrionic ships were almost perfect. The yacht was armed and armored against disaster, but this time something failed. Somehow, as she picked her automatic path into the thin cloud of galactic debris around

Sol, some hostile scrap of iron or stone escaped her psionic detectors and came through some unguarded chink in her shielding fields. She was wounded fatally.

Her shudder woke the prince. He tumbled out of his bed, cold with disaster, but for a moment he found nothing wrong. The impact was not repeated. The lights came on, and he had time to see the glasses and the empty bottle beside the chairs where he had sat talking with the count, not even upset. He was trying to believe that sickening jar had been a dream, when the alarm came.

COLLISION ALERT!

That shocking warning screamed silently from the same psionic screen where they had sat watching Sol exploding like a bomb of violet light before the plunging ship.

MAIN DRIVE DISABLED. EMERGENCIES BURNING OUT. ALL HANDS ADJUST LIFE BELTS. STAND BY TO ABANDON SHIP!

He reached automatically for the life belt in its glowing holder above his bed. It snapped out to meet his hand, a flat mechanical serpent. He stooped to adjust it, but it slid out of his fingers and coiled itself around his waist. Its wonderful quickness was comforting, until he thought of the count.

The old nobleman had stretched his stories to last out the bottle. Afraid he wouldn't wake, the prince turned to call him—and felt the emergency drive collapse. Suddenly weightless, he was swept up from the deck. He snatched wildly at a passing chair, but it eluded him. He tried to shout, but panic took his voice.

LAST ALERT!

The screen flickered and dimmed.

STAND BY ESCAPEWAYS—

The screen went out. For an instant he thought the whole ship was dead, but then he saw the escape hatch in the wall of his bedroom glow red and burst open. Outrushing air flung him toward it, but he clutched at a table, still hoping to reach and help the count. A roaring wind tore the table away, tossed it ahead of him, splintered it.

For the stricken ship had died before the escapeway was fully open. The door had stopped half across his path. He had time to see the empty bottle and the weightless glasses shatter against its hard metal face, and he tried desperately to gather his own spinning body for the shock.

The next thing he knew, he was lying somewhere in the dark. He had been savagely mauled. A grating agony caught his right arm when he tried to raise himself. One side of his face felt stiff with dried blood. He tried to imagine what had happened, but his senses and his brain seemed useless as his throbbing arm.

Something was smothering him. A dull jagged blade stabbed his chest

with each breath, as his body fought for air. He wondered dimly if the belt had brought him to some dark and airless asteroid, before he remembered that it ought to give illumination and ought to renew the oxygen around him. He explored the broad links of it with his good hand, and found three caved in.

Its psionic servos had been battered as badly as his body, but there were still the manual controls. He felt for the control link and slid the cover back and twisted the oxygen booster stud. His gasping lungs found comfort again, and his foggy senses cleared.

The damage to himself and the belt bewildered him at first, because that device was designed to guard itself and its wearer from almost any hazard. But then he remembered that half-open door, which he must have struck before the belt was fully activated.

He sat up carefully, clutching at his disabled arm with the other, and tried to see where he was. The shielding field of the belt supported him a little above the muddy ground. Steep banks of rain-cut clay loomed up around him. A few stars danced feebly in the murky sky above. Straggling weeds stood dark against the sky, rustling in the wind.

Wind and weeds—air and life. This was no dead asteroid, but some habitable planet of Sol. Relief eased his pain for an instant. For the quarantine station was near the inhabited planet, hidden on its moon. He would surely be picked up at once.

Or would he be? His unhurt hand moved numbly to finger the harsh stubble bristling through the caked blood on his chin, and he tried vainly to wet the rusty dryness in his mouth. He must have been adrift for many hours. The damaged belt had failed to take him to the station or to call help for him, but perhaps the voice transmitter would work. He groped with a feverish haste for that little instrument on its flexible cable.

"Calling Sol Station!" He croaked his name and title. "I'm off the *Royal Mother*," he gasped. "Down in a gully on some savage planet. Please trace my signal, and send a rescue craft."

He put the instrument anxiously to his ear and heard nothing at all, not even the whisper of the converter. The thing was dead. It slipped out of his fingers and the little cable snapped it back into place.

But part of the belt was working, for it still held him off the ground. Perhaps it could carry him on to the station, under manual control—if he could breathe. The air was already bad again, however, even with the booster stud all the way out. He was panting in spite of the pain in his chest, and anoxia was once more clouding his senses.

He saw that he must try to repair the damage. Though he wasn't an expert technician, he had been tutored in the theory of neutrionics. He

thought he could follow the psionic instructions packed with the assortment of tiny tools and spare parts in the repair link.

Yet he shrank from taking off the belt, even to inspect the damage. Without its invisible field around him, he would be exposed to all the unseen dangers of this unknown world. To hostile monsters and deadly microbes and perhaps to savage men.

Anxiously, he blinked again at the fringe of ragged weeds above him. The light seemed stronger now, as if dawn were coming, and he could see that the plants were green. Green leaves meant chlorophyl, releasing free oxygen. That assurance decided him.

Twisting painfully, he groped for the emergency link. His quivering fingers found the repair kit and the tiny psionic translator and the deadly little neutrionic pistol, but he left them in the link. He slipped out the flat first-aid packet. Peering dimly at the bright psionic labels, he found the general immunization needle. Clumsily, he pulled off the sheath with his teeth, and stabbed the point into his disabled arm, above the injury.

That would protect him from infection. There were drugs in the packet to ease pain and speed tissue repair, but already the labels were blurring in his mind. He had to have air. He found the release key, where the belt fastened, and twisted it frantically. Something clicked. The field died. He fell.

He had meant to land on his feet, but the gravitation caught him like a great wave breaking. He must have been weaker than he knew, from his injuries and anoxia, for he staggered and went down. Blinding pain twisted his arm again, and his lacerated face plowed into cold mud.

His breath went on. For a moment the only thing in the world was the agony in his arm, but that faded slowly into a dull numbness. He got good air into his aching lungs again, and rubbed the mud out of his eyes and sat up stiffly, reaching for the belt.

It was gone.

He scrabbled desperately around him, searching for it in the weeds, and stopped when he heard the faint click of it against the hard clay bank behind it. He turned in time to see it, almost severed where the links were crushed, crawling away from him like a crippled snake.

The release key had failed to stop its damaged mechanisms. He swayed to his feet and stumbled after it. Before he was half across the gully, however, it had glided to the top of the bank. A sick dread of losing it had slowed him, when it struck a projecting root and dropped back to the bottom with a faint tinkle of the links. Sobbing with relief, he staggered on to seize it.

It rose before he could reach it,

drifting straight up now as if the shock of its fall had brought some new signal from the broken servos. Its motion seemed quite slow at first, and he ran desperately. His bare toes struck something, with excruciating pain, but he hobbled on frantically.

He caught it.

He had it in his hand. His snatching fingers must have jarred the crushed servos again, however, for the free end of it whipped against his wrist like a snake striking. The sharp blow broke his hold. It slithered away, and darted upward. He saw it for an instant, a silver spark flying out toward interstellar space. Then it was gone.

He sat down weakly on a slab of driftwood, gasping painfully again for air and overwhelmed by his predicament. Down alone on a savage planet, crippled and unarmed, with no way to call for help and nothing to establish his position. With the belt, even here, he had still been a prince of the matriarchy. Without it, he was nothing. Civilization was a complex of countless worlds; cut off from it, he was as nakedly defenseless as some single cell dissected out of its body and exposed alone. Stripped of all those mechanisms that many million minds had helped to make, he couldn't hope to do much with his own small smattering of neutrionics and psionics. He was suddenly robbed of place and class, reduced to a shuddering human zero.

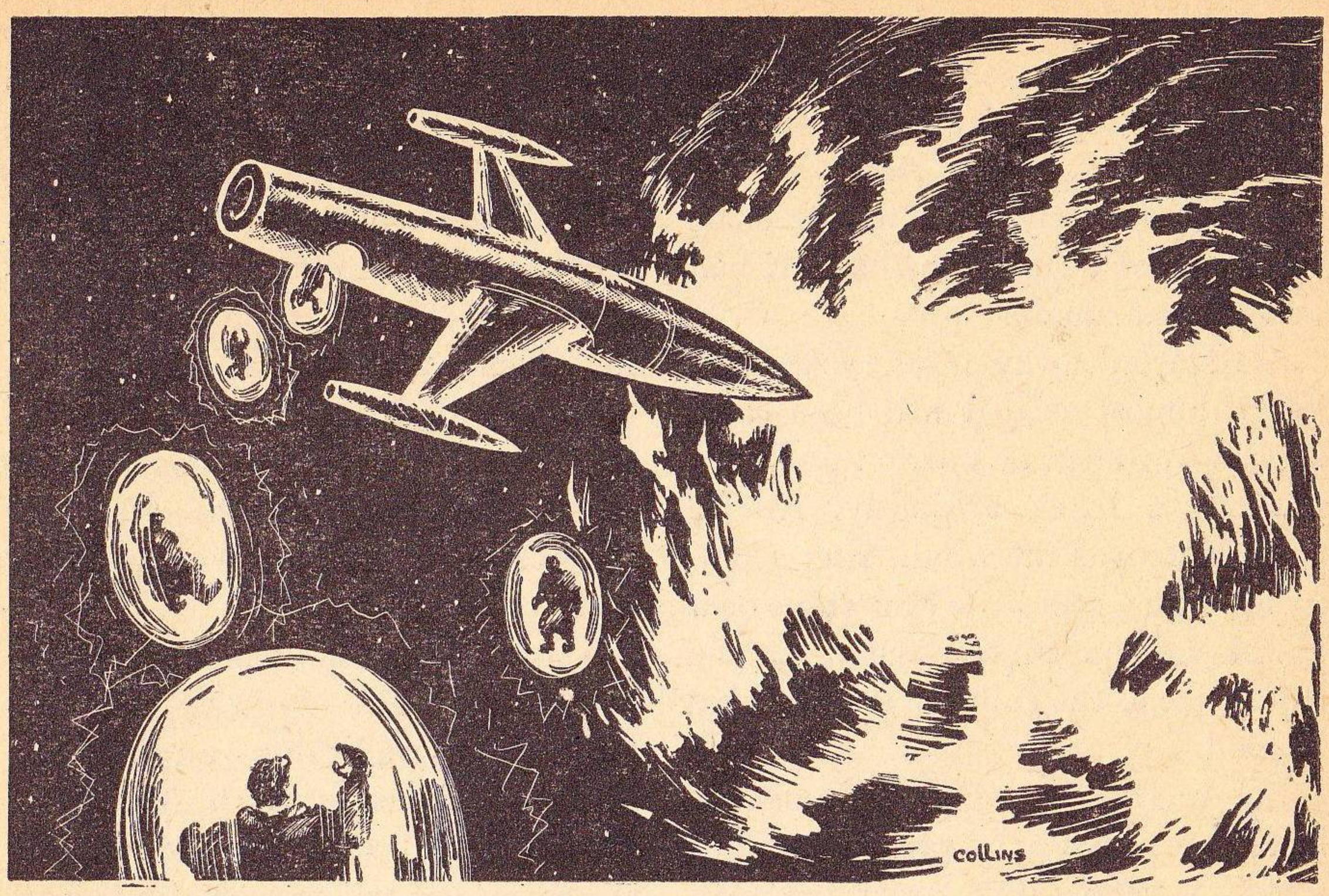
"So you weren't afraid of being late for the coronation?" he muttered harshly at himself. "You simply had to have a look for those lost men who came this way to look for liberty. Well, here you are!" He looked around him dully. "Now what are you going to do about it?"

He felt fairly certain that this was the third planet, because of the good air and the green leaves. The belt at least had brought him past the deadly cold and the poisonous atmospheres of the desert outer worlds before it failed.

Even here, the chill of the dawn had already set him to shivering. He huddled down in his thin night clothing, nursing his numb arm and watching the bright blood oozing from his bruised toes, wondering hopelessly how to save his life.

From where he sat on the damp driftwood, the whim that had brought him here appeared incredibly fatuous. The bite of the wind and the throb of his untended injuries gave a new luster to everything that he had thrown away. His stunned mind fled from this muddy gulch to the magnificent palaces and the quick psionic servants on his mother's vast estates, that he might never see again.

The shrieking infant princess he had knelt to kiss was doubtless a handsome girl by now, and her own interstellar travels would be arranged to preserve her youth—and to protect her mother from any unfilial haste to take the throne. But she was lost, and



all the empire he might have shared with her. His mother's enemies would make the most of his fantastic indiscretion. Unless he got back on time, he would find some rival in his place. Disgraced, robbed of title and fighting rights, he would probably live out his broken life in some labor camp.

Unless he got back—he lurched to his feet in the mud. He had to get back, and civilization was less than two seconds away. If he could only reach the quarantine station on the satellite with any sort of message, he would be rescued at once and on his way to claim his princess and his throne.

If—but how? Without the belt, he had no way to call the station, or even to talk to the natives here. The meaning of the quarantine came home to him, with a crushing effect, when he thought of the lost translator. Protected under the Covenants, this backward planet knew nothing of the outside. He could hope for no help from these savages, not even if they turned out to be friendly.

But they wouldn't be friendly. He saw with a sickening clarity what would happen to a stranger caught wandering on his own world without any weapon to prove and defend his social place. The best an unarmed and classless alien could expect was some sort of slavery.

Hunched and shrinking from the

wind, he looked around him for any warning signs of men. He found only the red banks of the gully and the rank weeds along the rim, until his eyes fell abruptly back to the shattered timber where he had sat. It had been sawed square.

He started away from the broken beam, almost as if it had been some savage workman or warrior, and then paused to listen anxiously. All he could hear was the wind. After a moment, with a stiff little grin at his own alarm, he limped cautiously up the easier side of the gully, to see what lay beyond.

Sol was rising when his cautious head came above the ragged stand of weeds, a yellow disk larger than the sun at home. It lit a level green plain, scattered in the distance with clumps of trees around tiny wooden huts. A herd of spotted cattle were grazing near him, and a primitive motorcart crept along a road beyond them. The whole landscape had a comforting look of peace, and a wild hope shook him when he saw the ship.

It burst out of the sky above the low sun. The glint of its bright metal dazzled him, and for an instant he thought it was a neutrionic flier. He thought the belt had brought him to some civilized planet, after all. He thought that shining ship could take him home.

In another moment, however, as it lumbered slowly across above him, he saw the clumsy spread of its wings and heard the noise of its primitive engines—a crude atmospheric flier. This was Sol III, and he was still marooned.

Real spaceships must come here now and then, he knew, on the business of the station, but he would never see them. They would always slip down silently at night, to leave or to meet some undercover agent at a secret rendezvous on the desert or the ocean—he had no way to know when or where.

Those disguised outsiders—could he seek out one of them? Scowling after that vanishing aircraft, he shrugged helplessly. Such undercover experts would visit the planet only rarely, on important special missions. He might never encounter one of them, even in a lifetime here. Even if he should, he had no means of recognition.

Could he bring them to him? They were here to prevent culture-collisions. Suppose he learned some native dialect, and simply began telling the truth about himself? That ought to bring the inspectors fast enough—but it wouldn't get him back home for the coronation.

Violators of the Covenants, he remembered the count saying, were usually carried to some distant headquarters of the service for trial, so that no matter what the verdict the bewildered offender found himself released so far away in time and distance from any world he knew that he

had no choice except to atone for his crime by enlistment in the service. Time never turned; such exiles never got home.

No, he could expect no aid from anybody. He cradled his hurt arm with the other and turned to let the sun warm it, wondering desperately how to reach the station without some fatal breach of the Covenants. For a long time, sick with the ache of his arm and shivering even in the sun, he stood peering through the weeds, discarding hopeless schemes. His only real chance, he saw at last, was to try building a psionic transmitter.

Any large or spectacular application of civilized technology would certainly excite the wrath of the inspectors, but they themselves carried psionic equipment. A transmitter with the short range he needed would be a tiny thing, simple enough to conceal from people who knew nothing of psionics. One brief call would bring quick rescue.

To accumulate parts and materials for the instrument would take all his luck, however, and probably years of vital time. He would doubtless have to learn some native tongue, and try somehow to gain the respect or at least the sufferance of these savages. He was not at all a skilled psionic technician; although even the crudest kind of improvised device ought to reach the station on the satellite, he would have to allow for a good deal of experimental test and error. All those risks and difficulties promised to surround the undertaking with a desperate uncertainty, but he could think of nothing else that seemed to offer any hope at all.

The first step was to come to some sort of terms with the natives. Although some degree of hostility seemed certain, he couldn't stay hidden forever. Even at the hazard of death or mistreatment, he must have food and shelter and whatever medical care they might give him.

Uneasily, careful to set his bruised bare feet where the ground looked smoothest, he climbed out of the gully. He hoped to reach the road beyond the pasture and wait there for another passing cart. Pretending to be the victim of some traffic accident, he could conceal his ignorance of any native dialect by appearing dazed or even unconscious. With any favorable turn of luck, he might obtain emergency care and knowledge enough of the tribal customs to help him plan another step.

Picking his tender-footed way across the unkind turf, he paused abruptly when the grazing cattle raised their heads to watch him. The fat beasts made no hostile movement, however, and he had started limping on again toward the narrow pavement when he saw the tower.

That sent him crouching back into the gully, careless of his naked feet. It stood implacably over a cluster of huts far in the distance, and the

weeds around him had hidden it before—an armored turret on tall metal legs. A guard tower, precisely like those on his mother's estates at home. Those huddled huts around it must be the barracks, and all this friendly-seeming plain an agricultural labor camp.

His first hopeful plan was shattered. In or near a prison camp, he would surely be taken for an escaping worker. His injuries would get him no consideration. The overseers would doubtless whip him to find out where he belonged, and kill him because he couldn't speak their language.

Even if he managed to survive in the camp, he couldn't hope to find materials or time for any sort of psionic experiment. Cowering down among the weeds, away from the watchers and the weapons in that frowning tower, he considered how to gain his liberty.

His first impulse was simply to follow down the gully, keeping out of sight. That might lead him to water that he could drink—thirst burned in his throat again, when he thought of water. And the gully should bring him, sooner or later, to the fence around the camp.

Yet that scheme was impossible, he saw at once. Hurt and half naked, he couldn't travel far. Although he might tear up his pajamas to make some sort of wrapping for his feet, his dangling arm would hamper every movement. Cold and thirst and hunger would pursue him, relentless as the guards. His total ignorance of the camp's geography would surely trap him in the end.

No, that wouldn't do. Dependence on such devices as the belt had left him too little faith in his own limbs and senses, and his tutors had not trained him for any such slinking, animal effort. He knew how to fight, but only in the open, by the rules of honor. He had to play some bolder, more human game.

Searching for some sane first move, he dropped lower among the weeds and turned uneasily from that ominous tower to study the nearest little group of trees and huts, just across the pasture. The neat white buildings, too small to be barracks, had no stockade around them. The place was a dwelling, he decided; probably the home of some minor camp official.

If that were true, the inhabitants must own weapons that allowed them to move about unquestioned. Certainly there was food and water about the huts, and he could see a motorcart beside them. There, no doubt, was everything he needed to survive and escape.

Awkward with his arm, he clambered back to the muddy bottom of the gully and waded cautiously along it toward the little villa. When the gully turned, he climbed clumsily back to the rim, to look for some other cover. There was none.

The huts were still several hundred yards ahead, across the open pasture. An unpaved path came down to a rude wooden bridge near him. The tower commanded the path, but the bridge seemed to offer shelter of a sort, and he limped on to it, hoping that the traffic over it would bring him some kind of opportunity.

In preparation, he tried to arm himself. He looked for a stone, and found only crumbling clay. He found another driftwood slab beneath the bridge, but it was far too heavy for a club. He tugged at a smaller stick lodged beneath it, but the rotten wood snapped and let him stumble backward. His hurt arm struck the bank.

Pain blinded him. Sweat chilled him, and he sank down on the useless timber. For a moment he could only huddle there, crushed beneath all his handicaps, but then a dogged pride came back to stiffen him. He was still a prince of his mother's house, and he had learned long ago to withstand equably bitter frustration when his sisters used to mock him for being only a boy.

When he could move again, he ripped both sleeves from his pajamas. One, he split to make a clumsy sling for his arm. The other, tied at the end, he packed with all the wet clay he could readily swing. So meagerly equipped, he climbed back to his post at the end of the bridge.

As he settled himself in the screening weeds, a man came out of the dwelling. A vigorous-looking, dark-haired savage, outlandishly clad in jacket and trousers. That womanish garb was a badge, no doubt, of some superior position, for he got into the cart alone. It began to roll at once.

The prince crouched lower, breathlessly testing the weight of his weapon. There came all he needed to make his forlorn bid for freedom—the queer clothing, the wheeled machine, the superior weapon of an officer. But how take them?

Crippled as he was, he could hardly jump into the moving cart. He had to make it stop. Desperately, he dropped back into the gully and seized that decaying timber. It was too heavy for him to lift one-handed, and the effort hurt his arm and his damaged ribs. Yet he managed to drag it up the sloping bank and roll it out across the path.

Gasping and trembling, he snatched his heavy little bag of clay and turned to look for the cart. It had turned the other way, toward the road beyond the huts. Sick with disappointment, he watched it creep out of sight toward that staring tower.

Dully, then, still panting from his struggle with the driftwood beam, he groped for another plan. If he could slip into the huts unchallenged while the owner was away, he might at least find food and water—

He dropped flat when another native left the dwelling and came walk-

ing toward the bridge—a slighter savage than the first, in more masculine clothing. A guard, perhaps, left to watch the premises while the officer was away. He carried a heavy-seeming, black-cased device that must be a weapon.

The prince wrapped the top of the weighted bag around his quivering hand, and crouched down to wait among the weeds. He would let the man walk on by, and then rise up to strike from behind. Here, fighting these simple human beasts, he wouldn't have to utter any challenge or warning—or would he?

A sudden cold uncertainty crumpled his first eager resolution. He knew that any honorable challenge would be fatal to him, but the code he had learned wasn't easy to ignore. Though the ruling sex could take everything else, the old count used to tell him, men could always keep their honor.

Desperately, he tried to sweep his compunctions aside. He was fighting for his life and a throne, against wild men who had probably never heard of honor. Why worry about the rules? Anyhow, he didn't mean to kill the fellow, but only to disable him long enough to claim his clothing and that odd weapon.

Panic swept away his indecision when the guard stopped halfway to him, and lifted that device. He thought he had been detected. The watchers in that tower must have seen him when he started across the pasture. They must have alerted the villa. The official had fled in the cart, and left this guard to dispose of him.

His bag of clay was suddenly absurd, and his whole scheme hopeless. He wanted to scramble back into the gully, to hide or run away, but things had gone too far for that. He could only flatten himself in the shallow ditch beside the road, waiting helplessly.

Nettles stung him, and pollen from a stinking little yellow bloom tickled his nostrils alarmingly. He jammed his finger against his upper lip to keep from sneezing, and watched the savage bending with an implacable deliberation to adjust the weapon.

That black device puzzled him. It looked too short to be any kind of accurate gun. Distance hid all its details, until sunlight flashed on a lens. He dropped his head among the nettles at that, and tried to shield it with his arm, waiting for the blaze of some primitive lethal ray.

Nothing happened. Nothing that he could detect. He felt no heat, heard no blast, saw no blue glow of ions. He lay flat as long as he could endure the nettles and the strain of waiting and the pressure on his damaged arm. When he looked again, he had to blink with astonishment.

The savage had turned away to point the weapon at the cattle. He looked fearfully to see its effect, but the beasts grazed on unharmed. To

his growing perplexity, the man calmly replaced the ineffectual device in its case and came strolling on toward the bridge with no appearance of alertness or caution. Perhaps the gadget was no weapon, after all. Perhaps he had not yet been seen. Perhaps, if he lay very still—

A shock of terror shattered his returning hope. For the savage had come near enough for him to see the delicate fair face and the shocking shape beneath the deceptively masculine dress.

A woman!

A girl, really, soft-haired and graceful, tall with the pride of her sex. He froze, afraid even to breathe, trying to hope she might walk on by. He was baffled by her presence, as well as terrified. Even though these tribes might be barbarous enough, for all he knew, to imprison or enslave woman, she was obviously no forced worker. Yet she could hardly be a guard; certainly no woman he had ever known would have lowered herself to such man's work. He tried for a moment to doubt that this was a prison farm at all, but the shadow of that brooding tower was still too ominous to be forgotten.

Afraid to look at her, but more afraid to turn his head, he lay watching her go by. Whatever her business here, her sex was a fortress around her. The men of the matriarchy were expected to shed one another's blood as freely as they could, so long as honor was observed, and he thought the customs here must be more or less the same. But women were taboo.

He couldn't touch her. Even if the mysterious device in that black case had been another life belt, he couldn't have swung his useless bag of clay to take it. That inhibition was his mother's stern voice speaking in him, imperative and final.

The girl passed him, not three steps away. He thought for a moment that she would surely see him, but she held her head as high as any matriarch's, her dark hair brushed with red by the sunlight, her lean face scrubbed pinkly clean. Her clear brown eyes looked over him to the red fingers of erosion reaching out from the gully, and her face turned sadly wistful.

"*Wasted land,*" she breathed softly to herself. "*Lost like my own country and my people. Perhaps freedom also . . . what is the English word? Erodes, I think. For want of care, like the soil. Of course the doctor's trying now to save this old farm. Perhaps that's the difference. The land can be reclaimed.*"

He strained to hear, but the murmured words meant nothing to him. The psionic translator in his belt would have brought him the sense of every syllable, and enabled even these psionic illiterates to understand him, but that device was just another atom now somewhere out in the interstellar drift.

Relaxing a little, as she went on by,

he let his eyes follow. She looked surprisingly healthy and clean for a savage, and the sadness he sensed about her almost made him forget his own danger. Something made him feel that she was another troubled exile, as far from home as he was. Another outsider, perhaps, here on an undercover mission from the station?

Unhappily, he put out that brief spark of hope. He couldn't hope to meet a civilized agent by accident. Certainly she wore no translator, or her words would have reached his mind in his own language. She was a native, a woman, and armed; three times an enemy.

She went on out of view, but he could follow the tap of her feet on the bridge, going on beyond him. He was breathing again, when her footfalls paused. He tried not to move, but he couldn't keep his fearful eyes from her. He saw that she had stopped halfway across. She leaned over the wooden rail to study the footprints he had left in the gully, and turned back to look at the timber he had dragged into the path. Her frowning eyes lifted. She saw him.

He lay petrified, so still that he heard the startled intake of her breath. Whether she called the men from the tower, or decided to dispatch him now for her own amusement, there was nothing he could do. She was a woman, and he had no right or strength against her.

"How did you get here?" she gasped.

Though the words meant nothing, he heard the breathless shock in her voice. She stepped instantly backward, lifting that black-cased device defensively. He shrank from the bright threat of its lens, but nothing happened to him. She let it fall when she saw his blood-caked face and the sling around his arm, and called anxiously:

"Are you badly hurt?"

Her sympathetic tone astonished him, for the women he knew were usually amused by the duels and the wounds of men. He hoped for a moment that she might get help for him, but then he thought of the futile threat of his own clumsy weapon. He dropped the weighted sleeve and sat up hastily to hide it with his body.

"Who are you?" She bent over him. *"Can't you speak?"*

He caught her interrogative inflections and saw her waiting anxiously for some reply, but he kept his mouth shut. Evidently she had taken him to be one of her own tribesmen in trouble, but any word he uttered might give his life away. He sat watching her apprehensively.

"You're afraid," she whispered suddenly. *"I see you are. Because you don't belong here—or why look at me that way? Are you another refugee? Did you parachute, perhaps? Great Plains County is a long way from the Iron Curtain, but not too far I think for bombers."*

She paused to peer at him, nodding slowly.

"*If that's the way you got here, I know how things must be with you—though I came out on foot, hiding in the woods and gnawing frozen turnips, until people who remembered freedom helped me cross the border. And I want to help you—if you really are a friend of freedom. Don't you trust me? Or is it just that you don't understand English?*"

He made no effort to answer, and soon she spoke again in a tone of troubled urgency. From the sudden changes in the accent and rhythm of her words, he guessed that she must be trying different local dialects, all equally unknown to him, but he sat blinking at her blankly, not even shaking his head. Later, of course, if he contrived to keep alive, he would have to learn some native tongue, but now he was afraid to let her know he didn't belong here.

"*Can't you walk?*" She beckoned abruptly for him to stand up. "*Come with me, if you can. You must be cold and hungry, even if you aren't too badly hurt. I can find food for you, and call Dr. Stuben to do what he can. There were strangers beyond the frontier who did as much for me.*"

She held out her hands to him—clean as his mother's, though the nails were cut short as a man's, not grown into twisted ornamental claws. Protestingly, he showed her the mud on his good hand. With a quick little shrug, and a smile that said the grime didn't matter, she caught his hand and tugged him to his feet.

That uncovered his bag of clay. He tried to kick it back into the weeds, but in spite of him she saw it. And she must have understood the purpose of it, from the shaken way in which she dropped his hand and stepped back to study him.

"*So you were that desperate?*" She shook her head, her lean face darkly troubled. "*Perhaps I understand. All one night I lay hiding from the frontier patrols, with a dagger made from an old file hidden in my clothing. I meant to kill the man who found me. But don't you know this is America?*"

He shifted his weight uncomfortably on his sore feet, listening mutely. He was not convinced, from her quiet self-assurance in the shadow of that grim tower and from the curious little side arm she carried so carelessly, that she herself must be an official of the camp. He had expected her to kill him, when his own worthless weapon betrayed his abject desperation, and now he couldn't understand why she didn't. Adjusting his arm in the sling, he set his face to hide the pain, waiting blankly.

"*You've no cause for such alarm,*" she said softly. "*You can't be in that much danger. Are the police after you? I don't think so. You don't look criminal. Anyhow, I won't hurt you. I've seen too many informers, and I know*

what freedom is worth."

Confused by the senseless words and her inexplicable behavior, he stood wishing hopelessly that the count had got here with him. He had come to depend on the count, who killed his men at home and won his women, too—the matriarch herself had sniffled when they left her to board the *Royal Mother*. The count would have known what to do with this enigmatic savage.

"*Can't you understand at all?*" Her urgent voice was now clear and slow, as if she spoke to a troubled child. "*I want you to come with me—and try not to be afraid. Even if your head is injured . . . I'm afraid it is . . . so that you can't talk or can't remember, my sister's husband can surely help you. A kind man and a clever young doctor. Whatever's wrong, I think he'll understand. Won't you come?*"

The count would have known how to deal with this dangerous girl, but the prince felt helpless. He knew no world except the matriarchy, and far too little of that. Even on the interstellar cruise, he had never been able to escape the dull round of formal state affairs arranged for him on every planet or call, for all his envy of the way the count always contrived to disappear long enough to extend his own informal observations of the local

rules of love and honor.

"*Won't you come?*" the girl repeated anxiously. "*Or can't you walk?*"

The old nobleman might have guessed what she wanted, but the prince could only stare and shake his head. Facing her and all her unknown tribe, he had no guide except his own confined experience. Whatever the ways of her world, he had been conditioned by his own.

He saw his peril clearly, but he could not escape it. He knew her people must live by other laws and customs: no woman at home would ever debase herself by touching or even speaking to an unarmed and classless man. The count might have guided him around the deadly traps that must lie hidden in that cultural difference, but now he could only blunder on alone.

"*If you simply* won't *understand, I'm going to call the doctor.*" She turned from him slowly. "*He ought to know what to do.*"

She started away from him, and swung abruptly back. He wondered with a stab of apprehension if she had decided to try that odd side arm again, but then he saw that she was only beckoning for him to follow. Although he still couldn't guess what she wanted, he dared not disobey a woman. He limped hastily after her, toward the huts.

She adjusted her pace to fit his careful steps, with a confusingly masculine consideration. And when he blundered into a patch of sandburs and hopped painfully from one bare foot to the other, she didn't laugh at him as a normal woman should, but bent instead to help him remove the thorned seeds with a quick solicitude that seemed almost indecent. He didn't understand her, and he felt somewhat relieved when another native emerged from the larger hut ahead.

"*Well, Eliska?*"

An older woman, the other came out across the neat patch of clipped grass in front of the white-painted hut, and halted when she saw him. Her shocked eyes swept him, and he studied her hopefully. She looked akin to the girl, with the same wide forehead and wavy dark hair, though her chin and nose were bolder. A pale scar-line zigzagged down one thin cheek. The harsh lines around her mouth showed a really feminine severity, when she swung to rap at the girl:

"*Where did you find that tramp?*"

Even though he didn't understand the words, her decisive air and her strident voice reassured him. He sensed something of his mother in her, and more of the matriarch. The girl's masculine softness had baffled him, but this was the sort of woman he knew.

"*I walked down to that old wooden bridge with my camera,*" the girl was answering. "*I found him lying in the ditch by the road. But I don't think he's*

what you call a tramp."

"*Then what's wrong with him?*"

"*He seems hurt. But I don't really know, because he doesn't speak.*"

"*Deaf, maybe?*"

"*I think he hears. Perhaps he'll be able to talk, when he recovers a little. I want to bring him in and call Carl for him.*"

"*You want to bring* that *into my clean house?*"

The girl flushed and bit her lip, as if choking back some angry outburst. The older woman stood planted with stringy hands on lean flanks, frowning at her sternly. The prince felt the clash between them, and saw that the older was the one in authority.

"*If you don't want him in the house,*" the girl said at last, "*I'll put him out in the little room where the hired man used to stay. Do you object to that?*"

"*I didn't mean to seem hard,*" the woman answered more quietly. "*Feed him in the kitchen, if you like. And find clothes for him—there's an old suit of Carl's, and a pair of shoes the hired man left under the cot, if he can wear them. But why keep him on the place?*"

"*He's in trouble. Afraid, as well as hurt. He needs more than food and shoes. Maybe Carl can find out what's wrong.*"

"*Why not just send him on to the hospital in Great Plains?*"

"*He can't have money for the bill—not with him, anyhow. Besides, I don't think he'd want to go. From the way he was hiding in the weeds, I think he must be some kind of refugee—*"

"*From jail!*" the woman broke in harshly. "*He looks like the sort to brain us all in our sleep, so that he can loot the house.*"

"*If he's dangerous, Carl should know,*" the girl said. "*But I don't think he is—except perhaps to those hunting him. He does seem desperate—but then I was desperate once, before people I had never seen took me in and risked their lives to help me cross the border.*"

"*He doesn't look harmless to me.*" The woman swung to study his slung arm and lacerated face with a visible suspicion. "*And what could make him so desperate, if he wasn't hurt holding up somebody or breaking out of prison?*"

"*I think he parachuted out of a plane,*" the girl said. "*He doesn't seem to speak English, or any other language I tried, but perhaps he's just too dazed to talk. I think he is a Soviet flier, who didn't want to bomb the free world.*"

"*A likely notion!*" the woman muttered scornfully. "*The trouble with you, Eliska, is that you're trying to look at this homicidal maniac—a fool could see that's what he is—in the light of your own unfortunate experience.*"

"*I have no other light.*"

"*The horde of crooks and bums and convicts that come hitchhiking along the highway yonder have given me another kind of experience,*" the woman said. "*Though I admit I never saw quite the like of him. He does look foreign, with that queer haircut and those odd pajamas. Won't he talk at all?*"

She stalked to the prince and prodded his chest where the ribs were cracked so hard that he almost flinched. His breath sobbed out, and he had to blink.

"*You?*" Her harsh voice lifted. "*What's your name?*"

Yes, she was clearly the one in command. Her loud assertiveness had already convinced him that she was some high official of the camp, and now her grimly imperative air made him fairly sure that she was demanding his class weapon, though she must see that he was unarmed. He tried not to think what might come next, but he had seen classless men whipped to death for little more reason than the matriarch's amusement. Even though she was comprehensible, he began to prefer the enigma of the girl.

"*Well?*" She jabbed at his ribs again, so vigorously that he gasped and swayed backward in spite of himself. "*Can't you speak?*"

Holding a manful silence, he looked at the girl.

"*Please, Greta!*" She spoke quickly, as if in answer to his mute appeal. "*You hurt him—don't you see how white he went?*"

"*I don't intend to be cruel,*" the woman muttered grudgingly. "*You may go ahead and put him in the garage room if you like—but just for now. Let him wash up if he's able, and take him something to eat. I'll call Carl.*"

"*Thank you, Greta,*" the girl whispered. "*He needs our help. You can see how desperate he is.*"

"*Too desperate to stay here,*" the woman said. "*Carl will tell you that.*"

She stalked back toward the dwelling hut, with the air of an affronted matriarch. The girl beckoned again, and the prince followed her across the grass to another tiny building. He could see, from the concrete ramp and the wide doorway facing the road, that it must house the motorcart, but the girl took him to a little door at the side and motioned for him to enter.

Beyond the door, he saw a narrow little cell, that looked and smelled surprisingly clean. Furnished only with two wooden chairs and a metal bed covered with a faded but spotless blanket, it still looked inviting to him. The girl stood nodding for him to go inside, but he stopped to examine the lock, wondering if she meant to shut him up.

"*You needn't be afraid of me.*" She smiled, and her quiet tone seemed disarming. "*I'm sorry my sister's so ungracious, but she takes America for granted. Anyhow, you'll get all the help you deserve—though I'd still like to know what you're running away from.*"

She entered ahead of him, as if to show that she meant him no harm, and he followed her doubtfully. While he stood waiting uneasily, she stepped inside a closet almost as wide as the room. Beyond her, he saw shelves cluttered with dusty oddments: the puzzling, clumsy paraphernalia of people

without psionics or neutrionics; quaint artifacts that were probably worn out or broken and discarded now. Most of them he couldn't identify, but leaning in one corner was a rusty iron tube—

He looked away from it with an apprehensive start, as the girl came out. Holding a towel and a frayed white garment, she nodded for him to follow into another room—a tiny bath, primitive but clean. She turned a valve to let water run, and he bent thirstily to drink.

"*Wait.*" She gave him water in a glass. After he had rinsed his mouth and drunk, she helped him wash himself and put on the clean bathrobe and a pair of woven slippers. When that was done, she opened the bed for him, but he still felt too apprehensive to lie down. He sat uncomfortably in a chair. She saw him flinch from an unexpected twinge of his arm and came quickly to help him move it in the sling. Her unwomanly tenderness embarrassed him, yet he couldn't help feeling a baffled gratitude.

"*Now,*" she said, "*aren't you hungry?*"

He started to follow again when he saw that she was leaving, but she shook her head and beckoned him back and showed him that she would leave the door ajar. When she was out of sight, he limped hastily into the closet to look at that iron tube.

Yes, it was obviously a discarded dueling piece. One made for long-range use. The tube was rifled, and mounted on a thick wooden stock. He bent anxiously beside it, to test the crude breech mechanism. The massive parts had been shaped with a surprising precision. Rusty and in need of oil, they still worked. He scrabbled hopefully among the stranger debris on the shelves above, and found a carton almost full of heavy little projectiles, sized to fit the chamber.

He was armed!

The mere possession of such a formidable piece might entitle him to leave the camp unquestioned, if a man's weapon was the mark of his position here as at home. Even if he were challenged, a victory would give him the rights and weapons of the challenger—assuming that the customs of combat here were more or less like those he knew.

But were they? No man at home would leave such a deadly piece to rust in an unlocked closet. Did that mean different rules of honor here? He rummaged hastily through the shelves in search of clues, and found rough clothing, a simple battery lantern, a pair of primitive binoculars, a long iron knife in a sheath.

Equipment for a private killer, clearly; but the nature of it suggested that the killing was done in the open, possibly in some wilderness district set aside for combat, and its apparent lack of any recent use seemed to hint that affairs of honor might be restricted to some special season.

He couldn't guess the rules, how-

ever. His momentary elation flickered out, when he saw that the weapon, powerful as it looked, had only sharpened the horns of his dilemma. Every possible course of action required assumptions about the way these people would react, but all he knew was that he didn't know. Inexperience paralyzed him.

He had loaded and cocked the rifle, in the brief triumph of its discovery, but now he set it reluctantly back in the corner of the closet and limped unhappily back to his chair to wait for the girl. Her warm kindness seemed so unwomanly and even unnatural that he couldn't quite believe it, or help expecting some cruel betrayal. Yet he felt too tired now, too dull-witted with his pain and too deeply confused by all the contradictory clues around him, to do anything except submit to her perplexing care. The rifle was too heavy, anyhow, for quick or accurate use, one-handed.

She came back at last, with dishes on a tray. A fragrant hot drink, toasted pieces of some thick native loaf, steaming soup. The odors made him suddenly famished, and he began eating with an uncourtly haste when she set the tray on the arm of his chair. The food was surprisingly good, but his appetite left him when he heard the throb of an engine and saw a motorcart rolling to a stop outside the windows.

He rose apprehensively, as a tall savage rapped and entered. By his own code, a man caught with no weapon at hand to show his place was fair game for any stranger, but all he could do was to straighten and compose his face, ready to die decently.

The native made no sign, however, that looked like a challenge. Surprisingly, in fact, the man carried no obvious weapon, certainly nothing like the dueling piece in the closet, but only a small leather bag. Only casually alert, he didn't seem prepared to fight. The prince looked at him and sat down again, suddenly weak in the knees.

"*Eliska*," he said, "*so this is your mysterious airman?*"

The girl hurried to him, speaking with a low-voiced urgency. She was begging a favor, obviously, which he appeared indisposed to grant. He shrugged and shook his head, with an air of firm decision that seemed almost feminine.

"*No*," he said, "*I'll have to make a report. Really, Eliska, I can't say I think much of your refugee theory. I'd say he was more likely hurt in a traffic accident. If so, he'll probably have people looking for him. In any case, I can't be responsible for hiding him.*"

"*But he seems so desperately afraid.*"

"*For some good reason, Greta's sure. Don't be a fool, Eliska. If he's really wanted, you'd soon have us all in trouble.*"

"*Is it foolish to look for freedom, or to help men find it?*"

"I'm afraid your own adventures have left you a little melodramatic, Eliska." The tall man grinned. *"Since you're so set on it, I'll give him first aid enough so he can stay here until I do report the case. A dressing on those lacerations, and a temporary splint on that fracture. But I imagine that either his relatives or the law will soon turn up to take him off your hands."*

"Carl, please give him a chance—"

"I'm due at the office now," the man broke in firmly. *"Let's see your patient."*

She nodded silently and followed him across the little room, with a quiet resignation strange in a woman. The prince could see the dark anxiety brooding in her eyes, however, and the mute rebellion trembling on her compressed lips. He could guess that this curiously commanding man was somehow his enemy, and she his friend, defeated now in some obscure effort to defend him.

He felt bewildered and alarmed. His eyes fled to the window in an unconscious search for escape, and found that stilted turret again, looming cruelly above the huddled, distant barracks. Perhaps the girl had tried to save him from the slave pens there, possibly to be her own retainer, but whatever her effort she had been defeated.

"They tell me you aren't talking."

He looked up silently when the savage spoke, and waited as stoically as he could when the man came striding toward him.

"No matter." The native shrugged cheerfully. *"Let's have a look at that arm."*

When the doctor was done, the girl followed him out to the cart, her voice hushed and hurried with some troubled appeal. The prince sat waiting, his arm almost easy in the primitive splint, but the fire of the harsh antiseptic still burning the torn skin under the clumsy bandages on his face. He wondered dully what the girl wanted, and whether it had anything to do with him, but he felt too limp and weak to do anything about it.

She came back at last, with a thin grave look of half-beaten determination on her face. Silently, she set up a little folding table in front of his chair. She brought sheets of rough paper, and primitive marking-sticks, and a stack of huge, quaint native books.

"Now," she begged him earnestly, *"can't you somehow tell me who you are? And what you're hiding from? Carl's going to report you, in spite of all I can say. I'm afraid that even here in America the police aren't always very careful about the rights of moneyless strangers, and I want to help you if I can."*

He felt her worried urgency, and guessed that she wanted him to identify himself. Hopefully, he opened one of the queer, thick books. The lines of crowded symbols, in flat black prepsionic printing, meant less to him than her speech. He found a few child-

ish pictures, bare little outlines in dead ink, without depth or movement or psionic meaning. He closed the book and shook his head.

"*Here's a pencil,*" she whispered anxiously. "*Can't you write?*"

He dragged the marking-stick awkwardly across the paper, and bent to look at the track it left: a thick black smudge, which failed to reflect his striving mind with any image at all. He dropped the useless pre-psionic implement, hopelessly.

"*Don't get depressed,*" she murmured quickly. "*Let's just try something else. Maybe you can show me on a map where you're from.*"

He leaned eagerly to study the patterns of color in the next book she opened for him. At first they looked almost like psionic films but they made no response to his mind. They were only irregular flat splotches, lifeless as the pictures. He gave the girl a puzzled frown.

"*Don't you even know where we are?*" She made sweeping gestures at the room around and then land outside, and then bent to pencil a careful dot on a wide green splotch. "*Great Plains County is right about here. Understand?*"

He peered again at the spots and the grid of lines across them, and caught his breath when he recognized the continental outlines of Sol III, not as he had seen them in the psionic charts on the yacht, but distorted into some kind of childish flat projection. Evidently, then, the colored patches symbolized something about the land surface of the planet, probably tribal territories.

"*Here's Prague, in my own unfortunate country.*" With a momentary sadness on her face, she touched another dot in a narrow red strip, pointed the stick at herself, drew a ragged line from red land to green as if to represent a journey. "*Now can't you show me where you are from?*"

She gave him the marking-stick, but he shrugged and put it down.

"*From Siberia?*"

She touched him with the black point and put it to the page again on a vast yellow space, looking at him eagerly as if to see if he understood. He thought he did, yet he could only shake his head.

She meant to tell him, evidently, that she had come from the area shown in red, perhaps as a hostage or a prisoner of war. And she thought that he belonged to that third tribe, whose wider lands were in yellow—a people allied to her own, no doubt, and hostile to her savage captors here. That would account for her obviously inferior position now, and her apparent apprehension for him.

"*Don't you trust me?*" she whispered quickly. "*I can see on your face that you do understand.*"

He didn't try to answer. If he touched that yellow splotch, the act would doubtless brand him as an alien

foe of her captors, with all rights forfeit. Impulsively, he started to set the point down, hit or miss, on some other color, but he checked himself instantly; with these tribal rivalries extending over all the planet, he could too easily claim some people she hated, and so lose even her uncertain friendship. Yet, if he let her suspect that he came from nowhere at all on the planet, that would be a dangerous violation of the Covenants.

"*Try to answer*, she was begging. "*I'm afraid you won't have much time.*"

Her air of heightened urgency forced his decision. He put the point down at random on the green and traced a wandering spiral toward the dot where they were, put down the stick to peer around him with shaded eyes like one lost, and then firmly closed the book to end that dangerous line of inquiry.

"*I don't quite get it.*" She looked at him searchingly. "*Can't you speak? Or can't you remember? Or are you just afraid?*"

"*'Fraid?*"

He imitated the meaningless syllable, and gave her the stick. At first she merely stared, but then with a nod of comprehension she uttered the word again and carefully formed a symbol for it. The mark she made was senseless to him as the sound, but he kept on trying. He pointed at her, and made the movement of marking, and cupped a hand at his ear.

"*My name?*" she said. "*Eliska. Eliska Machar.*" She drew it on the paper and repeated the sound and corrected him when he mouthed it after her. "*Now who are you?*"

He knew what she meant when she pointed at him, but he touched his bandaged head and shrugged again. Any sound he uttered, except his imitations of her speech, would let her know that he hadn't come from any friendly land. Hastily, he began indicating objects around the room, and trying to learn the names she gave them. At first she seemed reluctant.

"*English is hard for a Russian,*" she murmured uneasily. "*And I'm afraid we won't have time for many language lessons, before Carl sends out the police.*"

He firmly ignored the protest he sensed in her voice. Anything he tried to tell her, true or false, might destroy him, but he had to learn all he could from her. A few dozen words, really understood, could save him from some deadly blunder. The merest smattering of her tongue ought to be enough, if he were lucky, to help him find materials for a psionic transmitter good enough to reach the station on the Moon. He began thumbing eagerly through the books, pausing to make her name those few of the dead, dimensionless pictures that meant anything at all.

He thought she seemed pleased with him, as they went on. She smiled a little once as if in amusement at some blunder of his tongue, and again with

a quick approval when she found that he was really learning words. *Table, pencil, chair. Map, picture, book. Arm and bandage. Eliska Machar.*

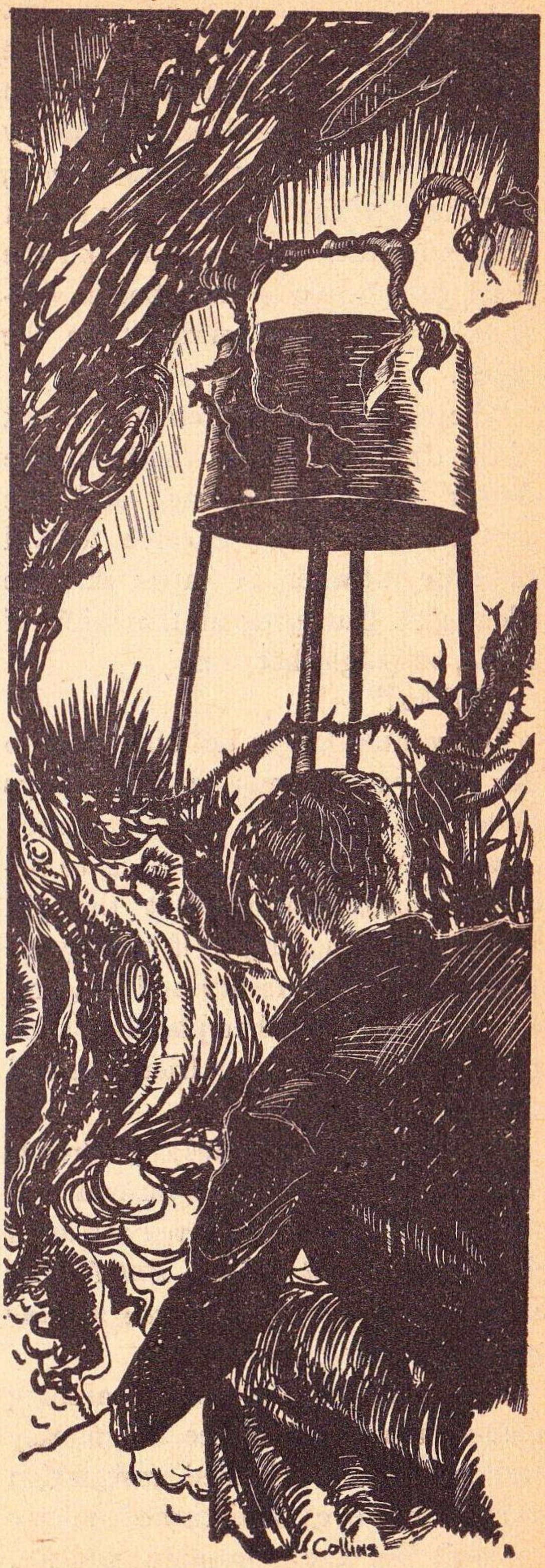
As he spoke her name again, more easily now, and watched her frowning over ways to teach him verbs a little less simple than *walk* and *strike* and *fall*, he found a moment to hope that the matriarch's screeching infant had grown up to be as charming as this simple savage girl. But that was unlikely, he knew; his future consort, if he really got back for the coronation, would be louder and bolder and altogether more womanly, entertained instead of hurt if he happened to break his head again.

"*I'm afraid that's all,*" she whispered suddenly. "*Here they come.*"

He tried to shape the sounds, before he saw her alarm. She turned to the window, her face drawn grave. Beyond her, he saw three motorcarts that came in an ominous procession down the pavement from that armored tower and turned off the highway toward the huts.

"Eliska?" He swayed out of the chair and shuffled quickly to her side. "Eliska—"

He wanted to ask her why the carts had come, and what he could do to meet the danger reflected on her face, but those primitive vehicles were not tables, nor the stilted fortress beyond them a chair. All he could say was her name.



The carts stopped. Four men left them. He recognized the tall native doctor. The lean savage striding from the second cart also looked somehow familiar, but the others were strangers, and they terrified him with the bright badges on their blue jackets and the short guns belted to their bodies. Obviously, they were guards from the tower.

The scarred, older woman ran out of the dwelling to meet the four. The doctor called something, and she pointed, and they all came toward the little hut where he waited with the silent girl. Quivering at the brink of panic, he caught her arm.

"Eliska!"

He wanted her to tell him what to do, the way his mother had always done, the way the new matriarch would do—if he ever got back to become prince consort. But the girl shrugged confusedly, as if torn by an unwomanly uncertainty and concern. She was only another placeless alien here, far from her tribe, friendless and defenseless as he was.

"*I can't imagine why you're so afraid.*" Her voice was hushed and troubled. "*I can't believe you're wanted for anything that serious. But I don't know who you are, and there's nothing else I can do.*"

She gave him a long, searching glance, that let him see the uneasy wonder and the baffled resignation dark in her eyes, and turned quietly to wait for the oncoming savages. Clearly she could do no more to help him. Suddenly alone beside her, waiting helplessly for life or death, he tried to find a manly calm.

He even tried to hope these men hadn't come to do him harm. After all, he tried to cheer himself, the native doctor had seemed surprisingly skillful and kind. But he couldn't keep from feeling the girl's disturbed expectancy, or seeing that bleak steel tower behind the stalking guards, or hearing the screams of placeless men who had failed to win the mercy of the matriarch.

These people were different, he told himself hopefully, so different that their culture had to be protected. Certainly this humble, generous, troubled girl would find no womanly delight in baiting and humiliating men. But then she came from another tribe. That loud, scarred female with the men outside was more like his mother.

He knew she had been displeased with him, and he thought she must have called these guards to take him. Though they might be willing to grant him some sort of honorable truce, honor was not a table, nor peace a chair. Time wouldn't wait for him to learn a language.

He was beaten. His notion of improvising means to reach the Moon was nonsense. This world was too different for him to cope with. These incomprehensible savages would kill him, now or later, because of some local law or custom he had never

guessed, and that would be the end.

He caught his breath and bit his lip and tried to wait in a manly way. Without the words, he couldn't talk. He couldn't hide, in this bare room. He couldn't even try to run; men of honor didn't run. He couldn't fight, with his right arm. Useless. Or could he?

A hot bright joy burst through his blank despair, when he thought of that rusty rifle leaning in the closet. His trembling stopped. His breath came back. His slung arm stopped throbbing. He was suddenly strong enough.

He ran from the window to the closet and came back with the rifle. It was too heavy for him to raise with one hand, but he thrust it across the back of the chair and dropped to his knees behind it. He found the trigger, as the guards came to the open door, and settled the stock against his shoulder. Defenseless as he was against this alien culture, he still knew how to kill and how to die.

"*Stop it!*" the girl screamed. "*They don't intend to shoot. What sort of savage are you?*"

He caught the unbelieving shock in her voice. He knew he had shattered her inexplicable sympathy, yet he shut his ears to her hurt outcry. For she was just another stranger, seemingly, trapped here as hopelessly as he was. She couldn't help him now.

Her frightened voice had checked the guards at the doorway. They crouched. Their brown faces sobered instantly with the frowning effort of all men at the old game of death. Their lean hands snatched for their own short guns, and they ran diagonally into the room, separating warily.

The quick and silent competence of their advance gave him a keen satisfaction in them, as well-trained antagonists. Their deadly readiness even restored his desperate hope that they might be civilized enough to know and keep his own high code of honor, which granted the winner the loser's rights and rank and weapons.

He hugged the rifle, swung the muzzle toward the empty doorway, squeezed the clumsy trigger. It came back stubbornly, but the report was a devastating blast. The recoil jarred him painfully, but the savages cringed back with a pleasing respect for the weapon. That warning shot was his challenge; adequate, surely, by any code of honor.

He bent behind the chair to reload. The neglected mechanism was hard to work, one-handed, but a fierce elation gave him strength enough. This was what he understood. This hot haste, this cold test of hand and eye, this healing release of all the bottled violence accumulated in him from his own frustrations and the crippling tyrannies of woman.

His next shot would be to kill. That was all that mattered now, for he knew at last that he would never reach the Moon or see his home again or

kneel at the throne of the new matriarch. If one of these fighting men didn't get him now, some other savage would. But let it come. Even though all his civilized education hadn't taught him how to survive in this barbarous culture, at least he knew the decent way for a man to die.

"*Drop your gun, brother,*" the nearer savage called. "*We don't want to shoot.*"

The quiet words sounded to him like a formal counterchallenge. He drove the stiff bolt home, and leveled the rifle over the chair again, and rose on his knees to kill the challenger. There was time enough, for the savage hadn't fully drawn. He drew the heavy gun against him, in a last grateful embrace, and found the trigger.

"Your highness—please!"

The words paralyzed him. Because he understood them. Because he almost recognized the breathless voice that shouted them. His finger slackened on the trigger. He let the rifle drop across the chair and stumbled to his feet, staring at the door.

"*All right, brother,*" rasped the nearer savage. "*Just stay where you are.*"

The sound of that was a senseless echo. He had forgotten the two crouching guards and their guns. He scarcely saw the pale girl shrunk back against the wall, her face lax with shock. He stood dazedly watching the door, and the three others entering: The bewildered native doctor. The scarred woman, twisting nervously at a lock of her hair, her manner of womanly dominion shattered by the shot. The fourth man, who had looked unaccountably familiar, walking from the carts. A man he must have known —where?

The prince stared at him. A rough-hewn and weather-beaten savage, taller than the lean doctor even in spite of the forward stoop of readiness that marked him for a man of honor. He was unarmed now, however, though he carried a flat brown leather case; and he looked somehow uncomfortable, as if the thick fabric of his clumsy native coat and trousers got in his way. He paused in the doorway to listen for an instant with one hand cupped to his ear, glanced down to adjust his hearing aid, and then drawled softly:

"Don't you know me?"

The deep hearty voice and the hard-bitten grin at last disclosed the man inside that fantastic native garb. The noble aide he had last seen staggering away to his stateroom on the *Royal Mother*, just before the collision.

"I . . . I didn't. Not without that monstrous mustache." The prince groped weakly with his good hand for the back of the chair. "I was blown out of the wreck before I could reach you. I didn't expect to see you again. Not here, anyhow."

"I missed it all." The old count shrugged regretfully. "Perhaps I had taken a drop too much of your good

whisky. The first I knew about the disaster was when I woke up in a strange bed at Sol Station. It seems my belt had brought me there, without much help from me."

"The yacht?"

"She went on into the sun," the tall outsider said. "The men at the station picked up our distress signals too late to salvage her."

"The crew?"

"All safe." Anxiety lined the count's hollowed visage. "All except yourself, sir. You were reported lost." He laughed nervously. "It looks as if that report was nearly true."

"*That your old deer rifle, Doc?*" the nearer guard was rasping. "*Won't you pick it up, before we have an accident?*"

"You got here at a good time." Grinning wanly at the old nobleman, the prince paused to watch the native doctor uneasily recovering the dueling piece he had dropped. "This trial of honor—against these savages who probably never heard of honor—had begun to look like my last. How did you find me?"

"*That's better.*" The guard relaxed a little, wiping at his forehead, turning to the count. "*Think you can calm him down?*"

"A moment, your highness."

Once more the count stopped to set his hearing aid, frowning as if it didn't work to suit him, and then he swung to face the watchful natives.

"He's my man." His bluff old voice thinned and lifted, in the way of deafness. "My missing client. I can see that he has been quite a problem for you, but I understand him. I'm sure he'll be all right now, and I'll gladly take him off your hands. All I need is a little time to talk to him alone."

The doctor and the guards retreated toward the door, nodding in a relieved way as if they understood. But how? The prince caught his breath, and stared at that apparent hearing aid—of course it was a psionic translator, disguised to meet the Covenants.

"You really know this man?" His startled glance went to the girl, who stood peering oddly at the count. She spoke the language of the matriarchy—but that was impossible. In an instant he realized that the sense of her words had come to his mind through that tiny instrument, so clearly that his ears could scarcely hear the strangeness of the sounds even when he tried.

"If you do, won't you tell me who he is?"

"Surely, Miss Machar." The old duelist smiled at her appreciatively, and replied with the enviable ease he must have learned on worlds where women were not supreme. "Dr. Stuben was telling me about your kindness to my client, and I'm deeply grateful. He's Mr. King. Mr. Jim King." He gestured at the door. "Now, if you don't mind giving us a few minutes alone—"

The other natives had gone, but the

girl still hesitated, looking from the prince to the count again with an air of puzzled unease.

"Thank you," she whispered. "But . . . if you don't mind . . . who are you?"

"His attorney," the count rumbled heartily. "And his friend. Here's my card. John W. Pottle, of Pottle and Swickley." He beamed ingratiatingly. "If you're still concerned about Jim's predicament, you needn't be. He's in good hands now."

She shook her head slightly, as if unsure of that.

"He seemed so terribly afraid," she said impulsively. "If you don't mind —what is his predicament?"

"Nothing alarming." The old man smiled at her anxiety. "He's all right now."

"Something dreadful must have happened to him."

"A highway accident, apparently," the count murmured easily. "But Dr. Stuben says he isn't hurt too badly."

"When was it?" She watched them both. "Where?"

"Sometime last night," he said. "Somewhere near here. Jim and I were driving through on business, you see. The car went dead, at the bridge this way from town. It was already dark, and nobody would stop to help us. Jim finally started walking down the road, to find a phone and call a wrecker. He never came back. I've been looking for him ever since daylight, but I couldn't find a trace anywhere until I called Dr. Stuben's office, and he told me you had found him. He must have been struck by a hit-run driver."

"If that was all, what made him so desperate?" Eliska Machar looked back at the prince, her eyes still dark with doubt. "Why was he hiding in that gully like some hunted animal?"

"Nothing strange about it." The count's rawboned features straightened soberly. "You see, Jim was a fighter pilot. In the last winter of the war, he had a pretty grim experience. His airplane was shot to pieces over Germany. Jim bailed out and got down alive with a splinter of flack in his leg. For three weeks of cruel winter weather, he lived in hiding among enemies whose language he didn't understand. The wound got infected, and he was half out of his head when he got back across the American lines. A thing like that is hard to forget. Dr. Stuben agrees with me that his accident on the road last night must have brought it all back to him. He was hurt and hiding again. As you put it, like a hunted animal. And he thought he couldn't speak the language."

"I see." Her dark eyes went back to the prince, concerned again. "Then his head injury is bad?"

"Only a slight concussion, Dr. Stuben says." The old man smiled cheerfully. "You can see that he knows me, and I'm sure his speech difficulty will clear up as he recuperates. Mostly, I

think he's just shaken up and nervous."

"Then I'll go and let him rest." She started toward the door, but turned abruptly back. "When you spoke to him and he answered—what language was that?"

"An Indian dialect," the count said smoothly. "One we learned from the guides on our vacation trips, when he and my own son were boys together. Jim was calling for my son in that dialect, before he came back to himself in the army hospital. When I used it to speak to him just now, I was hoping that the link with his boyhood would help him."

"I think it did." The girl nodded gravely. "Please forgive the questions, but I had to be sure you really were his friend. I'll go now."

The old man let her out and closed the door.

"She had me going." He grinned with relief. "But that ought to satisfy her, long enough at least to get us started home."

"Everything seems so simple when you do it." The prince smiled at him with a tired gratitude. "But I was done for. At first I had a crazy notion I could throw together some kind of psionic gadget that would reach the station, but this planet turned out to be too savage for me."

"Never underrate the natives—that was the first lesson I learned in the service." The count came briskly to inspect the bandages. "Looks like a competent emergency job." He nodded approvingly. "Do you feel able to travel?"

The prince nodded eagerly, although his splinted arm was throbbing again from the heavy recoil of the rifle.

"Then we had better be on our way. There's only one ship a year to this dismal little outpost, but luckily she's here unloading now. If we get aboard, we ought to reach her next planet of call just in time to catch one of Her Majesty's liners. I looked up the interstellar schedules before I left the station, and I believe we can still get back in time for your coronation."

"Excellent." The prince nodded brightly and settled back to ease his arm. Suddenly, he felt curiously reluctant to leave the hard comforts of the bare little hut. "I'm glad you got here," he murmured. "But how did you ever find me?"

"The psionic detectors at the station traced the automatic signals from our belts," the count said. "The rest of us were picked up quickly, but your belt was moving erratically and it stopped transmitting before the rescue craft could run it down. It seemed hardly possible that you had survived the collision, but when the commandant called off the search I got permission to make an undercover visit to this sector of Sol III—because your belt had been moving this way when the signal stopped."

The prince looked up gratefully. The count's weatherworn visage had blurred and suddenly he didn't trust his voice, but he reached impulsively with his undamaged hand to squeeze the gnarled fingers of the loyal old veteran.

"So don't you worry, sir," the count rumbled softly. "We can work out everything. With good luck, perhaps we can keep Her Majesty from learning that we ever left the route she arranged for us. Even if she finds out the truth, we can probably keep her favor. Just so we're back for the coronation."

The prince sat silent for a few moments, gazing absently at the little folding table where Eliska Machar had left her clumsy pre-psionic writing implements. He aroused himself, almost with a start.

"I'm fit to travel," he said slowly. "And I suppose you are safe enough, as a service agent. But what I don't understand is how we are going to explain my own sudden arrival and departure, without some violation of the Covenants."

"That's all arranged." The count snapped open the brown brief case to dig out a bundle of quaint native documents. "Even though I hardly hoped to find you alive—nobody else expected me to find you at all—I brought papers from the undercover office to account for you properly as Mr. James A. King."

"Did you bring me any side arms?" The prince leaned toward him eagerly. "Or any sort of passport?"

"We'll have to do without arms." Frowning, the count was thumbing through the coarse fiber sheets. "Here's your birth certificate. Social security card. Army discharge. Bank book, with two thousand dollars on deposit. Four hundred in currency. But no passport."

The prince sank uneasily back in his chair, but the gaunt old fighting man was grinning at him as if unaware of his disappointment.

"We just continue our business trip," the count went on confidently. "My car is to be picked up late tonight, from a lonely side road three hundred miles west of here, by a patrol craft from the station. We ought to get there with just time enough to let the station surgeon attend to your injuries, before we have to go aboard the interstellar ship."

The prince sat wondering how far they could go unarmed, trying to encourage himself with the old man's brisk assurance.

"These papers won't cause you any trouble." The count swept them back into the brief case. "The currency is good. The bank deposit actually exists. The other documents were really issued at one time or another to agents using that name. The service understands such work."

The prince nodded wearily, trying not to worry.

"I'll take care of everything." The count swung toward the door. "Now

I'm going to call the natives back. I'll do the talking—under the Covenants, you can't recover too rapidly. I'll pay the doctor and the girl for all they've done, and we'll be getting on to meet the flier."

The battered old duelist went to open the door, and the prince sat nursing his arm. He had nothing to worry about, because the count would take care of everything. Rescue him from these enigmatic savages, repair his arm and rush him home, appease the matriarch and see him through the coronation. After that, his new consort would do the talking.

He shrugged, and tried to be content. The count had warned him, he recalled, that freedom was a dangerous drink. But he had seized and sipped that moment of his own, and now he had been rescued from the natural consequences, almost intact. That ought to be enough for any man, he tried to tell himself, but still he wasn't quite content.

He sat silent, while the count called the waiting natives back from the dwelling hut and drew the doctor aside. The guards and the woman stopped cautiously at the door, but Eliska Machar came to straighten the sling on his arm, where the rifle kick had twisted it.

"Only five dollars?" the count was saying. "Since you've been so kind, let's call it ten." He paid the doctor and came smiling to the girl, with another ten in his fingers. "Miss Machar, you've been very good to Jim. As a little token of my own gratitude—"

"You don't owe me anything." She flushed and stiffened, as if offended. "I helped Mr. King because I thought he was a refugee, who had given up everything to strike out for freedom. I'm glad to know he's not in danger, but I don't want your money." Something shone in her dark eyes. "Because I know the worth of freedom," she added softly. "Since my free people have been captured and enslaved."

The prince saw her sadness, and suddenly he wanted to help her out of her own captivity. If he and the count could smuggle her past that dark tower in the motorcart—but that was impossible. The Covenants prohibited such meddling with native affairs, and he knew the count would never allow it.

"Jim and I are both deeply grateful, anyhow, Miss Machar." The count smiled and bowed. "Your generosity is a thing we won't forget, but we've a long way to drive tonight. We must go."

"Tonight?" Urgency hushed her voice again. "Don't forget that Jim needs medical attention at once. Dr. Stuben says he ought to have X rays taken right away, and I'm afraid his head injury may turn out to be worse than it looks."

"I'll attend to that," the count assured her blandly. "I'll take care of

everything. Now, Jim, do you feel like walking to the car?"

The prince stood up uncertainly. The girl saw his momentary weakness and reached quickly to steady him, and he clung to her fingers for an instant, feeling sick and grim in spite of himself because he knew his future consort would never sink to any such show of unwomanly sympathy.

Suddenly, he wanted to say something to her, some little word of parting that she might recall when he was gone. He caught his breath, but before he could speak he saw the count's stern frown, reminding him that his moment of freedom was spent. A dangerous habit, and difficult to break, but he checked that rash impulse obediently. He smiled at her wistfully and dropped her hand and turned to go.

"Wait." She turned quickly to the count. "He needs clothing before he goes out, and we can find him something—"

"That's all right," the count broke in firmly. "Very kind of you, but I have his bag at the Great Plains hotel, and we'll leave the robe and slippers there at the desk for you. I'll take care of him."

The prince was hesitating, still somehow reluctant to leave, but the count took his arm and led him firmly on ahead of the natives toward the waiting carts. He went silently, until he saw the long warning finger of the

tower beyond.

"You're certain?" he whispered suddenly. "Certain we can get out?"

"Why not?" The count snapped off the translator and dropped his voice. "What's in the way?"

"For one thing, the watch tower yonder. How am I to pass the guards, without some weapon of position?"

"What guards?" The count stared at him, and then grinned faintly. "This isn't our world, you remember. These savages haven't yet invented any civilized social order—not in this tribe, anyhow. These simple children of nature are still free to go about pretty much as they please. We don't need any arms of identification."

"Huh?" The prince blinked again at that frowning tower. "Isn't this a forced labor camp? Or some sort of prison?"

"So that tower worries you?" The count's lean grin widened. "It does look amazingly like the guard turrets on Her Majesty's farms. I admit that it rather upset me at first glance, before I knew what it was."

"You mean it isn't—"

"We're in another culture, remember. Actually, in spite of its grim appearance, that turret wasn't built to house spy screens or neutrionic guns. You'll be relieved to know that it's really only a harmless part of the Great Plains municipal water works."

"But those fighting men I challenged?" The prince peered unbelievingly after the two armed natives departing in their own cart. "Aren't they tower guards?"

"State cops," the count said. "And I'm afraid they misunderstood your challenge. We aren't at home, remember. There's no code of honor here—not as we know honor. These timid folk have no heart for civilized combat, and no decent respect for good killers. Instead of fighting as men should, they bribe these cops to defend their rights and lives. And even the cops—if you can imagine such an outlandish culture—even the cops disapprove of killing."

"You mean I wasn't in danger?" The prince caught his breath. "Not until I challenged them?"

The count nodded. "Yet that one gesture of decency almost destroyed you. The cops have a revolting custom of blood-revenge, so I was warned at the station. If you had killed one of them, the service couldn't have saved you. Let's get off this barbarous planet while we can."

The prince turned thoughtfully back to look at the three remaining natives, the doctor and his wife and Eliska Machar, who were walking slowly now from the dwelling hut toward the doctor's cart. In spite of the man's fantastic dress and the mannish skirts the women wore, they were suddenly human beings. He felt the count's imperative fingers on his arm, and slowly shook his head.

"I'm not going," he blurted abruptly. "I want to stay here."

"Your highness!" The count was shocked. "You can't."

"I think I can." The prince swung to face him, breathlessly grave. "You brought all those documents to prove that I'm a native named Jim King. Why can't I stay Jim King?"

"You know the Covenants forbid migration."

"But you can say you found me dead, just as the commandant expected," the prince whispered quickly. "You can say you left the papers to explain the body. You're an old hand in the service; you can arrange things so that I won't be discovered."

"Perhaps I could." The old nobleman stood scowling at him reproachfully. "But just think of—everything! All the fine future your mother schemed and I fought to arrange for you. The crown princess. Your place at her knees. Would you turn your back on the throne—on our whole civilization—for nothing at all?"

"Not quite for nothing." The prince looked away toward the gully in the bridge, where he had lain hidden in the weeds waiting for Eliska Machar. "How did she put it? I want to strike for freedom." His voice sank huskily, as the three natives came nearer. "Tell them I'm staying."

"Your highness—consider!" The count's hard fingers dug painfully into his good arm. "If you stay here now, you'll never have a chance to change your mind. I can't come back, and you'll have no way out. You'll live and die here like a savage."

"But at least a free savage."

"Even that wouldn't be so easy," the count whispered grimly. "You'd have to adjust yourself to these grotesque tribal customs. You'd have to learn to speak their uncouth dialects and train yourself to earn some kind of living—all without the use of any outside knowledge or devices that might betray you to the station. Is freedom worth all that cost and effort?"

He nodded.

"Your mother would never approve." The old duelist squinted at him, shrugging sadly. "But your will is my honor. If you are certain you know what you are doing—"

"I know," he said. "Tell them."

"Your highness—"

The old man's voice seemed to hang. He stood motionless for a moment and then sighed and straightened and strode firmly toward the three natives standing beside the other cart, fingering at his hearing aid.

"Dr. Stuben"—his bluff old voice seemed to falter for an instant, but then it went on clearly—"I've been trying to talk to Jim, and I'm afraid he's worse off than I thought. He still can't talk—not much even in that Indian tongue—but I believe he wants to stay here. I can't stay with him, because I've a long trip to make. I'd like to leave him in your care."

"Good." The doctor nodded, smiling gravely. "He does need immediate attention. I doubt that he's in shape to travel far, at least for several days."

"I won't be back soon." The old man's voice thinned and cracked. "In view of my own failing health, perhaps not at all. If I don't get back, and if it does turn out that Jim has a long convalescence, I want to know he's in good hands."

"I'll help him." The girl spoke out impulsively. "Before you came, I had started working with him, and his speech was coming back." She turned anxiously to the doctor. "Couldn't we let him have the hired man's job? I mean, if he's going to be here long. The work needn't be more than he feels like doing, and I think it would be good for him to be here while he's getting over all that's happened to him."

"Servant to savages!" the count muttered faintly.

"Please—" the prince whispered, but the count ignored him.

"Jim has money," the stern old man said stiffly. "Here with his papers in this brief case. Enough at least to pay for his care until he is able to look for some proper employment. He won't have to take such menial work—"

The prince silenced him at last, with an imperative gesture. Bleak-featured with the effort to control his agitated emotions, the proud old fighting man glanced at his native watch and gripped the prince's hand in the native way of parting and got hastily into his own cart. It lurched away at once, in a reek of fumes from the primitive engine, driven rather blindly.

"*Come along, Mr. King.*" The doctor opened the door of the other cart. "*We've some X rays to make.*"

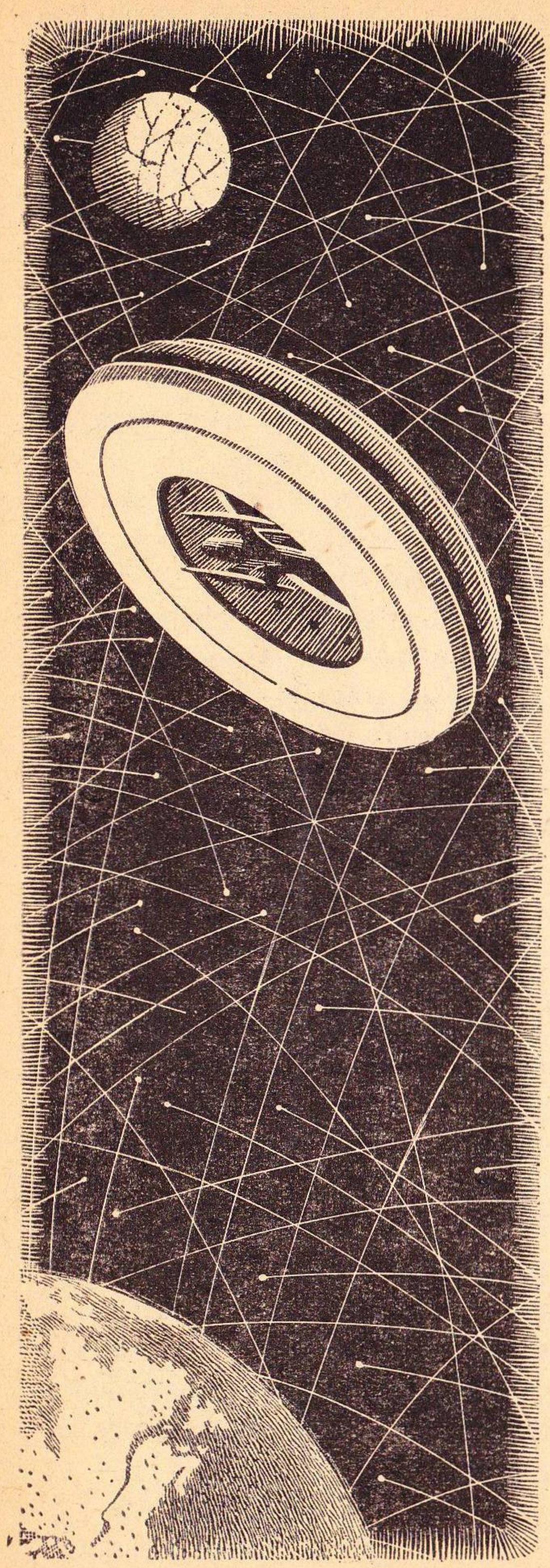
The prince shrank back, crouching to shield his arm again.

"*Don't be afraid, Jim,*" Eliska whispered quickly. "*You'll soon be all right again.*"

He couldn't help staring at her fearfully, for the untranslated words were strange again. He was cut off from all the world he knew, even from the enigmatic kindness he had found in her, forever marooned and alone. The finality of his isolation stunned him. His frightened glance fled after the departing outsider, and found that distant tower.

Not a guard turret, but only the village water tank. This simple world was not his own, but suddenly he felt at home. Even if he had to go unarmed as these childlike natives did, even if he had to work with his hands to live, he had found something greater than the throne of the matriarchy. He straightened to inhale the sweet air of Earth, and smiled at Eliska and the doctor, and stepped hopefully into the cart.

THE END



STAR TRACKS

BY SAM MERWIN, JR.

To some people, *the answer is the important thing, and the discovery that their accepted answer is wrong is a destroying blow. To others, though, the joy lies not in the answer, but in attacking the problem. For them, no answer is a blow!*

Illustrated by van Dongen

It had sounded like a milk run when Marny was briefed at Wright Field Rocket Base. All he had to do was take a trio of astronomers up to the newly installed telescope in the Doughnut, park there till they had completed for the first time free of Earth's distorting atmosphere certain brief and specified star-studies, then bring them back to Earth.

But the milk was definitely curdling. Marny's three eminent charges had already exceeded their original three-day stay by a full week and apparently the end was not yet in sight. To Marny, geared physically, mentally, nervously and emotionally for a life of intense action, of danger, of speeds of several miles per second, having to loaf for ten days inside the Doughnut was very like being locked in a coffin full of alien machinery tended by routine-occupied zombies.

It was no place for a hot rocket-boy like himself.

After giving the *Maverick* its daily check in company with Judson, the engineer in charge of rocketship maintenance, Marny strolled back along the curved corridor of the residence deck and slumped into a steel-and-leather chair in the wedge-shaped wardroom. He began to hum a little verse he had composed to the tune of "Mademoiselle from Armentieres":

"*The astronomer is a funny wight,*
that's for true.
The astronomer is a funny wight,
that's for true.
The astronomer is a funny wight,
He dum-de-dum-de-dum-de-doos
Hinky dinky parlez-vous."

Except that he didn't dum-de-dum the fourth line. Judson, a cadaverous wheat-haired individual who wore what the Doughnut boys called "satellite pallor" and existed by doctor's orders entirely upon a diet of blueberry muffins, regarded him quizzically.

"You're a slanderous character, Bob," he said. "If any of your unholy threesome overhears that, you'll be up before the commandant so fast you'll think you're wearing jets yourself."

"Oh, they've heard it—I simply change the one line to 'He *sleeps* all day and he works all night.'"

"They're not as dumb as they act," Judson warned. Then added, "They couldn't be."

"Now who's being slanderous?" said Marny, reaching for a silex.

Life on Earth's first artificial satellite was not without its share of creature comforts despite its notable lack of liquor, women and song. AS-1, known generally as the Doughnut and occasionally as the Millstone, both of which it vaguely resembled, had its own movie theater, comfortable bunks and food on a level with that of the submarine service.

But Marny was rapidly coming to loathe it. Curiously he did not mind

the far more confined quarters of his rocketship, YRS-15, unofficially titled the *Maverick*, nearly as much. For the *Maverick* at least went places—around the world in one hundred seventy-six minutes, to the Doughnut in less than eight hours, ultimately to the planets. But the Doughnut merely spun slowly on its hollow axis in a sort of everlasting free fall.

Finishing his coffee, Marny looked with disinterest on a pack of cards. "Judson, how do you stand it here?"

The engineer shrugged thin coveralled shoulders, belched slightly. His duodenal ulcers were nothing less than fabulous—hence the blueberry muffin diet. He said, stretching out his long legs in front of him: "It's just a state of mind. Drop in on a lighthouse keeper when you get back downstairs. It's not much different."

"Death, where is thy sting?" quoted Marny. He became aware of the constant thrum of the engines which kept the atmosphere constant in a surrounding locale where atmosphere was nonexistent. A couple of technicians came in for cups of mid-morning coffee and sat down at a table in one of the far corners.

"It's not so bad," said Judson. "Think of the money we save!"

"For what?" Marny wanted to know. "By the time you get back you'll be rusty in the art of spending it." He shook his close-cropped head, added, "I wish my gang would hurry up and get their chores finished. They're running way late and I've got a redhead in Dayton who isn't used to being kept waiting."

"There are plenty of those down there," said Judson, "always willing to help a man spend what he's got. Incidentally, what about this Dr. Lee you brought out here this trip? She seems to have taken a shine to you."

"To her I'm just a jerky kid," said Marny. He thought an instant. "Besides, who wants to make games with a lady astronomer? What about that little WAC in the commandant's office?"

"She's married to Captain Goss," said Judson. "No unmarried women allowed up here in garrison." He returned to his previous subject. "No fooling, Marny, I think Lee likes you. And since you're so anxious to get back downstairs, why not make a pass at her? You win, you're not bored any more—you lose, she runs to the commandant and you get *sent* down pronto."

"It's an idea," said Marny casually but he thought about it for all that. He wondered if he were getting island happy in ten days on the Doughnut. Dr. Carol Lee was a far cry from Nevada Wehinger, the well-upholstered redhead he hoped was waiting for him near Dayton.

But in her own way he supposed Dr. Lee was beautiful. And her figure, while not exuberant, was lissome. Her skin was the color of dusty almonds

and her lips were full and red. And, come to think of it, she *had* seemed to enjoy clowning around with him mildly when not on duty or asleep or in conference with her colleagues. He wondered—and then wondered what he was thinking about.

"I wonder what's keeping them here so long," he said to change the subject. "All they were supposed to do was take pix of Mars in conjunction—the way I heared it. And they've got no atmospheric worries up here—no clouds, nothing."

"They've found something," said Judson laconically.

"What?" asked Marny. "And how do you know?"

"Scuttlebutt," replied the engineer. "There's talk around. Haven't you sensed it, Bob? Something's up."

"Come to think of it I suppose I have," said Marny. "I put it down to satellite nerves. How do I know what's normal up here from visit to visit? What do you think it is?"

"I dunno—but it ain't good. They've been coding messages back downstairs like crazy for the past couple of days."

"What does Sparks say?" Marny inquired, interested. As one of the picked rocket-pilots selected and trained for the forthcoming interplanetary flights, any important astronomical discoveries might well be of importance to his career.

"Nothing," said Judson, yawning. "He wouldn't be here if he wasn't an oyster."

"I'll bet I can find out for you," Marny said recklessly.

The engineer studied him and he felt his face grow hot. Then Judson said, "Good luck. I'm curious myself. But this delay, the messages, the way they're muttering in their beards, all adds up to something big. Be careful, though, Bob. The commandant might bust you proper if he catches you. He's the boy who can do it."

A pair of atmosphere engineers came off duty then and that ended the conversation for the moment. Marny let himself be inveigled into a game of canasta and managed to kill a couple of hours while picking up some small change. He was bull lucky, for his mind was definitely not on the game—and he wondered if perhaps this presaged ill luck in the suit he intended to press later.

Gathering up his ego he knocked at sixteen hundred on the door of Dr. Lee's noncubical cubicle, suggested she share a glass or two of frozen fruit juice with him.

"I'd be delighted, Bob," she told him, holding the door open a foot or so. She was wearing a thin woolen robe and had obviously just emerged from her shower. Even wet and without makeup her lips were red. Marny knew she was much older than he—maybe thirty-five or six—but she looked like a girl in her teens.

He went back to his own quarters—he shared a bunkroom with a dozen

other officers of the station—and slicked up a little. He debated donning his four-row splash of campaign ribbons, decided against it. The boys would never stop ribbing him and it was going to be bad enough as it was—either way.

They sat side by side in the observation room and looked through the heavy quartz glass at the huge green-blue-white-and-brown globe of Earth. Marny studied her with new interest, new awareness, seeking signs of the strain of which Judson had spoken earlier.

In the dim light Dr. Lee's face was serene and untroubled. But when she held up a cigarette for his lighter he noticed that the fingers which gripped it trembled ever so slightly.

"Getting you?" he asked bluntly, indicating them.

For a moment she was startled and her face was blank. "Getting me?" she echoed, then, "Oh—I see. Perhaps it is—a little. I can't seem to get used to—that." She nodded toward the Earth-filled sky and he knew that she was lying.

"When do you think we'll be going back downstairs?" he asked, wishing his boysenberry juice were scotch and water.

"Soon," she told him. "Very soon now." She studied him and her dark eyes softened and she said gently, "Poor Bob! It's been hard on you, hasn't it—being cooped up here for so long, going nowhere?"

"I'm feeling it," he told her. "How come the delay?"

"We have made some interesting discoveries—interesting and unexpected," she said. Then, before he could probe further, "You fascinate me, Bob."

"You're ribbing," he countered, but added: "Why, Dr. Lee?"

"Call me Carol, please." She bit her lower lip thoughtfully. "No, I'm not joking, Bob. Oh, I don't mean 'fascinate' like some video idol on Earth. But you're so perfectly sure of yourself, of your training, so utterly single of purpose. It must be wonderful to be so sure of what you want."

"You must have been pretty one-track yourself, Carol, to have come so far in such a tough profession so fast," he told her.

"On the contrary," she replied. "I drifted into astronomy. Originally I intended to be an actress—but I turned out to have too many inhibitions in public. Then I wanted to be another Madame Curie. I studied physics and then astrophysics and the rest followed. I was more surprised than anyone when I was picked for this job. It is a great honor—and a great responsibility."

"How?" he inquired. "All you have to do is take pictures of Mars through the telescope they've rigged on the roof."

"Sometimes one finds more than one expects," she said slowly, then took a sip of her juice.

Marny felt rising excitement. "Do you mean to say that . . . that you've found proof of life on Mars?" he asked eagerly and half-forgotten dreams came swirling up from his childhood.

Carol Lee shook her head slowly. "No, Bob, there is no life on Mars. That I can tell you definitely." She smiled at him then, added, "But did you ask me out here because you wished my company or wanted to pump me?"

"A little of both, I'm afraid," he replied ruefully. He felt that he was getting nowhere fast. He was not accustomed to such directness or maturity on the part of his women.

She laughed, laid a small hand on the back of his wrist. "I like your frankness, Bob. Oh, I like flattery, too, but not now. Perhaps, after dinner, you will pay me a visit and tell me of your ambitions to visit the planets. And perhaps you will sing me the real version of that little song you have been singing around here the last few days."

"I'll have to know you a lot better for that," he said and the mantle of his confidence had once more fallen about his shoulders. He poured more boysenberry juice from the pitcher on the low table in front of them.

The next day, when they were inspecting the *Maverick*, fast in her magnetic lock in the Doughnut's central hole, Judson said out of the side of his mouth, "Find out anything, Bob?"

"Not yet," he replied. "Something's up, all right—something big like you said. But she's not talking."

"That ain't the way I heared it," said Judson with what passed for a smile.

"Shut up!" snapped Marny and was a trifle surprised at his own heat. After all it wasn't as if Carol actually *meant* anything to him—she couldn't under the circumstances. Or could she?

He recalled something she had said last night.

"Bob, darling," she had said in her soft, wonderfully flexible voice, "what would you do if there were no planets for you to fly to in your rocketship?"

"Huh?" It had taken a full second for the import of her question to sink in. "You're ribbing!"

"Perhaps—but what would you do? What would happen to your fine life if its bright shiny purpose were removed?"

Shaken more than he wanted to admit he had managed a laugh of sorts. "Oh, I guess I could drive racing cars or fly a plane for a skywriter. Let's not talk about that."

But now, again, he thought about her odd question. It was absurd, of course, but all the same, if it *were* true, what would he do? What *could* he do? He found himself unable to think about it and it retreated uneasily to the back of his mind. There

were a lot of far pleasanter things to think about.

The next night he saw tears in her eyes. "Why are you crying?" he asked.

"I have many reasons to cry but I am really far too old for tears."

The following day, at fourteen hundred, Marny was summoned to the commandant's office. His feelings were mixed—of various degrees of concern. He wondered who had talked—Judson, maybe, or one of the other astronomers. All at once the idea of being separated from Carol Lee was unbearable.

As he braced himself before knocking at the fateful door he found himself thinking, "Why, I must be in love—and it's ghastly!"

The commandant, Admiral Willis, motioned him to a chair beside his desk. His manner was grave but not accusatory. He looked pale, even for a Doughnut inmate, and the lines from nostril to lip corner were heavier than Marny remembered them.

"You'll be returning to Dayton tomorrow at six hundred, major," said the admiral. "The astronomy mission here will be ended then. I trust your ship will be in readiness."

"She's ready now, sir," said Marny, his elation causing his stomach to groundloop. "I hope the mission was a success." He was thinking of meeting Carol Lee later, and of long cool drinks with more than fruit juices in them; of smooth dance floors—

The commandant's reply brought him back to the Doughnut with a wrench. He said. "I am afraid—" He caught himself and added with a tightening of his lips. "Perhaps it was too successful, major. Good luck."

That was all—but it was enough to worry Marny when added to the other items he had picked up in the past few days—and nights. Days and nights even though it was almost always both on the Doughnut and divisions of time were purely arbitrary. He wondered what his mission *had* discovered here upstairs, using telescopes for the first time unhindered by Earth's atmosphere.

Carol Lee still refused to tell him that night, their last together in the Doughnut. She was affectionate and distrait by turns and listened to his plans for after the return downstairs without actually affirming them. Once or twice she cried a little and stubbornly refused to tell him why.

"It *must* be me," he said desperately.

"Oh no, darling. But there is so much to be done, so much to be faced. Have you ever considered what it would be like to deprive two billion people of a dream?"

"Two billion peo . . . you're crazy, Carol! Why, that's just about all the people there are on Earth." He was incredulous.

"That's correct," she told him. She was very intense, more beautiful

than any woman he had ever known. She seemed to have come suddenly to a decision. "Come," she said very quietly. "Come with me and I will let you see for yourself."

They quickly left the room, taking care not to be seen. The observatory on the top deck, close to the central hole in the Doughnut, was empty and Carol Lee had the key. She led him inside, got the electro-telescope adjusted, told him to look through the eyepiece.

He found himself staring at Mars. There were the white polar caps, the strange geometrics of the lines called canals, the ruddy-brown and pale-green surface areas. It was amazingly clear and looked amazingly artificial when viewed through the airless gulf of space.

"It . . . it looks very near, doesn't it?" he said. "And very small."

"It is . . . *very* near and *very* small," she told him. "Now"—she made other adjustments—"look beyond at the stars."

He found himself staring at a portion of the Big Dipper. And as he looked his wonder and incredulity grew. The stars were there, again viewable with amazing clarity—and again looking unmistakably artificial. He could even see little lines of light extending from them like—almost like tracks along which, infinitesimally, they were moving.

"What do you see, Bob?" Carol Lee whispered over his shoulder.

"I see . . . what are they . . . the stars look like moth holes in a velvet blanket with a light behind them." He looked up, around at her anxiously. "Tell me, Carol, tell me."

"We don't know yet, of course," she replied, her voice low. "But we have found this out—only Earth is real as we know it, only Earth and perhaps the Sun. It is a cosmic jest. Our atmosphere has hid the truth from us. The other planets are mere disks or marbles—of that we aren't yet certain. And the stars, whatever they are, move on tracks on the inner side of a dark barrier that encloses us."

She sat down, hugged one coveralled knee, went on. "For at least a decade now all the people of Earth have dreamed of space. Other planets might be hard to reach, might prove difficult for life as we know it, even impossible. But they were there—and there was always the hope that they *might* be made habitable.

"Man could dream, like Columbus, of new worlds. Now"—she looked up at him—"that dream is dead, a trick of the atmosphere. Charles Fort was right—astronomers are the greatest fools of all; and our universe is property—whose we cannot guess. It is a very great joke, Bob. And Earth must struggle along on the planet it has ravaged, with its overpopulation, its stupid clashing ideologies, its wars, its impractical religions. We are headed for a bad time, I fear."

But Marny was not listening. His stunned first reaction to what the 'scope revealed had passed through frustration to rage—and Carol Lee was the target of his anger. He drew himself up, looked scornfully at her as she sat.

"You *knew* this," he said. "You knew it when you let me make love to you. You knew it and felt pity for me. You were enjoying your own sense of importance at destroying a world dream and my stupid little career with it. You've been playing the Grand Duchess while I—"

"No, Bob—no, *no*, darling!" She was on her feet, clinging to him. "Listen to me. I was bound to secrecy. I still am."

"Oh, great!" he said, pushing her away.

She was suddenly so small, so frail, so weighed down with the horror of discovery and its implications.

"I guess I must be crazy," he said. "I love you anyway."

"*Bob!*" she cried softly as he put his arms around her. Then, holding him at arm's length, "But don't you *see? You* are more important than ever. There was no pity in my love—only hope of finding in you the strength I lacked in myself."

"It's crazy, Carol," he told her shakily. "It's screwball but it's all right." Then, as her words sank into his consciousness, "How do you mean I'm important now? If space is a mirage, my job does not exist."

"But, Bob, listen. Out there is a barrier, a barrier studded with what we call stars. It may not be so far away as we thought. We have been trying to measure the distance and it may not be more than a few million miles. Are we going to be contained forever within it, never seeking to learn its nature or what lies beyond?"

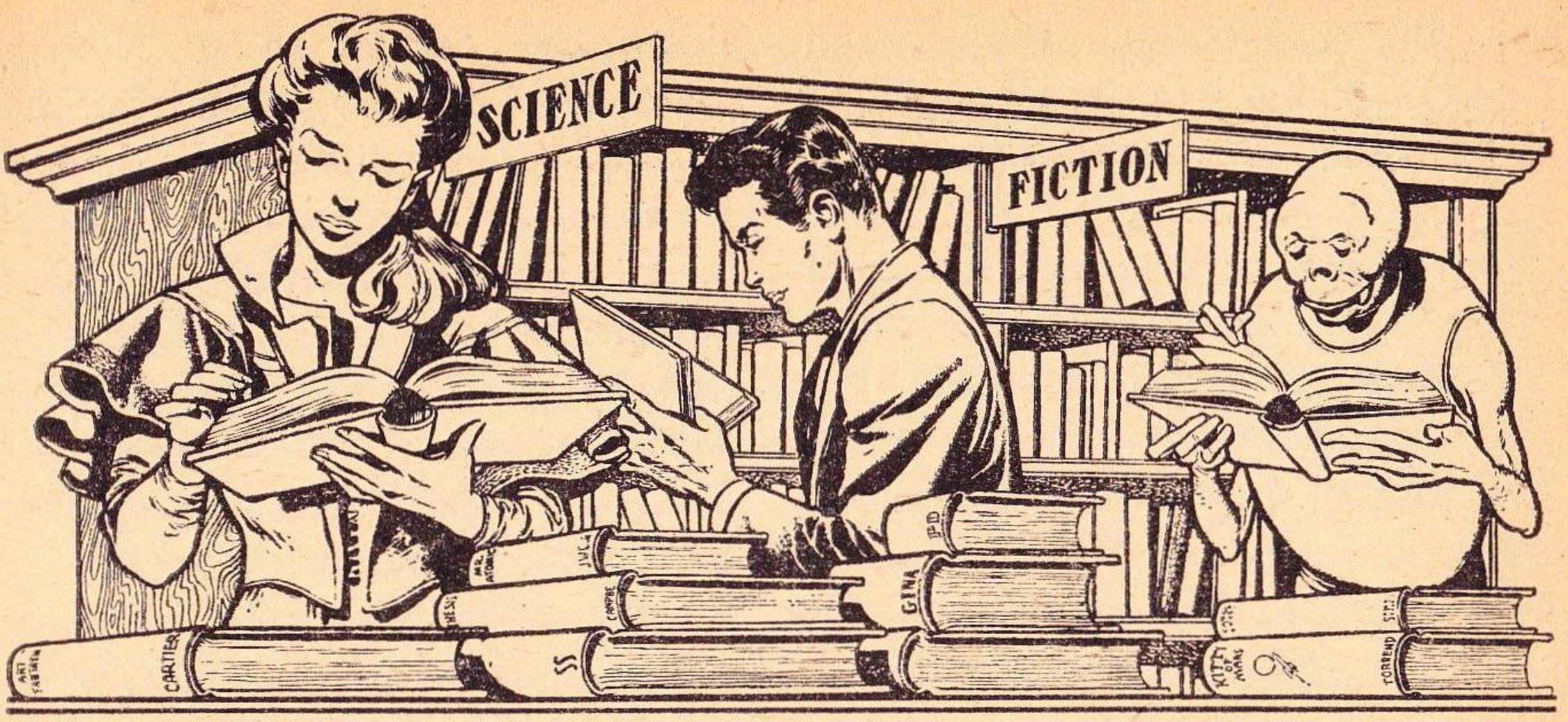
Marny looked at her as comprehension dawned within him. He ran a hand over his close-cropped brown hair, held her close within the circle of his other arm. "I wonder," he said, leaning to peer once more through the eyepiece of the telescope, "if the *Maverick* could make it."

"There will be a *Maverick Two*, maybe a *Maverick Twenty*, if she doesn't," said Carol Lee firmly. "I have learned to know you, Bob, and I am proud. Thank you for letting me hurt you, darling."

He glanced at the chronometer on the wall and whistled. "Come on, honey," he told her. "We've got to scamper. We've got a date in Dayton and a lot of planning to do. Let's go."

But his eyes were on the ceiling, as if they could pierce through it and see the barrier beyond, rather than on the door.

THE END



THE REFERENCE LIBRARY

BY P. SCHUYLER MILLER

JUNIOR DIVISION

If 1951 has been a year of anthologies—still coming at this writing—it has also been a year in which juvenile science fiction and related factual books have reached a new high point. Technically, children's books have always dealt heavily with fantasy, and edging closer to science fiction, as we know it, there have been the children's editions of Jules Verne, the "Tom Swift" and Roy Rockwood series, and innumerable stories—often excellently written and very popular—about life in paleolithic or neolithic times. The latter tales verge on historical fiction and will not be considered here, though they are still coming.

The seven books under discussion here and now all deal with one area of science fiction—interplanetary flight. This is not new in itself; the principal novelty in the situation is that for the first time writers and publishers are producing such stories for children of elementary school age rather than for teen-age boys—chiefly—in junior high or high school.

A digression to some of the psychological and educational facts-of-life may not be out of order here. Without arguing the point or its consequences, it may be said that it is a fundamental

assumption of present-day pedagogy that the quality we call "intelligence" is randomly distributed through the population according to what is commonly called the "normal frequency curve." The double-valued exponential function which describes this curve would probably cause grief in the printing department, and can be taken up in "Brass Tacks" if someone wants to argue: visually, the curve looks like a bell or a sombrero, symmetrical about the vertical axis where there is a high central peak and dropping off rapidly on either side to a flat terminal region. It is the curve you would get by tossing a large number of coins a very large number of times, and plotting the number of times you get any given number or proportion of heads. Applied to intelligence, it states that there will be very few people in any representative group who have extremely high or extremely low intelligence, and that most people will have intelligence ratings close to the value of the central hump or peak.

In education, for obvious practical reasons, children below a pragmatically selected intelligence level are excluded from school: most schools, however, try to teach fair-sized numbers of youngsters who are technically "morons," even though they draw the line at so-called "imbeciles" and "idiots." Until a little over a generation ago, our culture-pattern lopped off most of the rest of the left-hand side of the curve at an age of about fourteen to sixteen and sent the kids to work. The result was that the high schools of that time had and catered to a selected population of higher-intelligence boys and girls. This is one reason why in dad's and granddad's day they taught stiffer courses and demanded higher standards than they do now, for beginning in the early depression years, when jobs for young people disappeared overnight, every youngster who was able to be out of the house without a nurse or keeper began to stay in high school. The schools, which have to adapt their courses and methods of teaching to the clients they have, now have to work with pretty nearly the whole range of intelligence from the genius level down into moronia.

Bookwise this means that "juvenile" or "teen-age" books just can't be written or published to appeal to all young people of a given age or range of ages. In the same English class you will find boys and girls mentally unable to read anything more difficult than the comics—though emotionally they may have the same interests as their classmates—and a good many others who can read *and are reading* the best of the current adult books, fiction and nonfiction, and who even may have taken a fling at "Ulysses" and "Finnegan's Wake" with more success than their teacher or your reviewer.

Books like Robert Heinlein's new

"Between Planets"—Scribner's, $2.50—and his other juvenile novels in this series appeal in ideas and vocabulary to the more intelligent high school student. There will be a few in junior high who will read and enjoy them, and even a very few in the upper elementary grades—kids who are now being called "exceptional," and getting some of the attention they have long needed. This is why they have been consistently reviewed here as of interest to adults. In the meticulous way in which Heinlein develops the scientific minutiae of their plots and settings, but never makes them obtrude as, for instance, Jules Verne did, they stand in a class by themselves. Close to them in the naturalness with which they portray life among the officers and crew of a great military ship are the "Commander Bullard" stories from this magazine, seven of which have now been collected in a volume also labeled juvenile by its publisher. It is "Bullard of the Space Patrol" by the late Malcolm Jameson, "the science-fiction writer for science-fiction writers" (World Publishing Co., $2.50). Both of these books are being reviewed fully in this department, so other bibliographical data are not given here. "Bullard" should be easier reading than the Heinlein books, and should win a good many young converts to the better grades of science fiction by presenting exciting and interesting adventure stories told with an air of realism which makes their scientific aspects quite painless to take.

Two other recent books are aiming for the same secondary school group. They are "Moon Ahead" by an Australian writer, Leslie Greener—Viking Press, New York. 1951. 256 pp. Ill. $2.50—and "Lodestar," by Franklyn Branley—Thomas Y. Crowell Co., New York. 1951. 248 pp. $2.50. Of the two, the first is the better. Its heroes, an Australian and an American boy of about eighteen and their fathers, are taken along on the first rocket flight to the Moon, made by members of the BEAMS ("British Empire-American Moon Society"). They go through the usual experiences of a flight through space, land, explore the Moon, find strange tracks, and nearly come to grief there. In general the book is well written and scientifically well worked-out, though American youngsters may find the Australian attempt to reproduce Americanisms a bit quaint. As is common with most books for young people today, it is well illustrated—by William Pene de Bois, who is a leading figure in the field of children's literature as a writer-illustrator, and who received the John Newbery medal, "Oscar" of the children's book world, in 1948. "Moon Ahead" should interest a broader range of young people than Heinlein's books, but it will appeal less to adults.

"Lodestar," subtitled "Rocket Ship to Mars," should have been outstand-

ing and isn't. Its author is a science teacher who has written a number of books on elementary science for young people. He has the excellent practice of working out his books with the boys and girls in his science classes. This appears to be his first work of fiction, and the plot is strictly old-hat with a young hero one of a three-man expedition to Mars whose members are promptly captured by grotesque subterranean Martians, sentenced to life imprisonment but allowed to go on tour of the wonders of Martian technology, and who eventually escape in a nip-and-tuck race against time and the machinations of a minority of Martian "bad guys." Corn is the word for that. But the amazing fact is that the science is also full of holes, including the old one about a "zone of zero gravity" where the attractions of Mars and the Earth cancel each other, and where alone the phenomena of free fall are experienced. Some excellent ideas are quite spoiled by such things, and though I have firsthand testimony that the story is well-liked by youngsters, it is not the kind of juvenile science fiction we can hope to see teen-agers reading.

Dropping now to the elementary school level, we have quite a different picture. "Miss Pickerell Goes to Mars," by Ellen MacGregor—Whittlesey House, New York. 1951. 128 pp. Ill. $2.25—is advertised as "the first science fiction story for the eight to twelve readers," and as far as I know the claim is just. Here is a book written in children's terms, by a children's writer of some experience, illustrated by a fairly well known children's artist—Paul Galdone—but accurately worked out within the limits of comprehension of its intended readers. Miss Pickerell, an eccentric old lady who collects rocks, accidentally is taken along on a trip to Mars, is able to perform a deed of mild heroism to justify her food and air, and emerges triumphant when her collection of Martian pebbles wins a State Fair prize. I am not recommending it for A.S.F. readers as I do Heinlein's or Jameson's books; I do recommend it as a place to get an eight-year-old interested in real science fiction—and, incidentally, for you to argue out the experiences of flight through space with him or her. You'll be amazed at the burgeoning of curiosity about everything on earth and off at what is ordinarily fourth-grade level—age nine or so.

To help you with the factual side of rockets and space travel, there are two more new and excellent books for the younger set. A companion to "Miss Pickerell," though intended for children a year or two older—Grades 5 and 6, the publishers say, which I would extend on into junior high—is "You and Space Travel," by John Lewellen—Children's Press, Chicago. 1951. 60 pp. $1.50—who has also done a book called "You and Atomic Energy" which I have not seen. Here,

simply and accurately described with very clear, attractive, and lively diagrams and decorations by Winnie Fitch and Joe Phelan, are the basic facts about what makes airplanes, jet planes, and rockets fly, how they are different, and what happens when you take off into space. With your help, try it on your elmentary-school youngster; the quicker kind will eat it up.

And as a clincher, the biggest bargain in this field is a handsome little book called "Rockets, Jets, Guided Missiles and Space Ships" by none other than our old friend Fletcher Pratt, and with a potent artistic—and possibly literary—assist from one Jack Coggins. Mr. Coggins, on the strength of his illustrations for this book, is not only the poor man's Chesley Bonestell but ought to start getting contracts from the science-fiction magazines. The sixty-page book, with one or more beautifully done illustrations on every page except Willy Ley's brief foreword, comes from Random House and costs only one dollar. The end-papers of Mars from Phobos or the shot of a space-station at work are worth the cost. The difficulty of the style and vocabulary, however, probably put the book on the junior-high and high school shelf and no adult should be ashamed to be seen with it. If Willy Ley's classic tome can be reduced to nut-shell size, history and all, this is it.

Trends? We should hope to see writers and artists who are experienced in writing for children and young people using science-fiction themes, *with adequate scientific help* to insure accuracy—as Ellen MacGregor has done in "Miss Pickerell," who should really visit Venus, Jupiter, and a few stars. We should hope to see the Willy Leys and Fletcher Pratts, but also the experienced juvenile writers of nonfiction, producing factual companion-works like those described here. We should continue to see Robert Heinlein and others as well equipped as he writing original books in the main science-fiction tradition, but about people and situations which will interest our teen-agers as well as those younger still. Given these things we may be able to breed a school of juvenile science fiction which owes as little as possible to Roy Rockwood and "Superman," whose standards approach our own, and whose readers, as they mature, will readily and naturally come to like the kind of adult science fiction we like—and to carry the standard on beyond anything we have imagined.

BETWEEN PLANETS by Robert A. Heinlein. Charles Scribner's Sons, New York. 1951. 222 pp. Ill. $2.50

This fifth in Robert A. Heinlein's series of "juvenile" science fiction yarns for Scribner's is sufficiently adult in plot to have been serialized

in *Blue Book* as "Planets in Combat." It doesn't seem quite up to the standard set by "Space Cadet," "Red Planet," and "Farmer in the Sky," either for verisimilitude or reader interest, but them was high standards, pard!

What is rather surprising is that the Venerians of this book do not seem to be the same as the little amphibians of "Space Cadet"—who were at least close to those of the "Future History" tales. Instead, Heinlein gives us a lot of appealingly stupid little fauns, paddling about the fringes of the human settlements, and a dominant race of very potent "dragons."

Don Harvey, hero of the book, was born in space of a Venerian mother—colonial, that is—and a Terrestrial father. Summoned back to Mars under mysterious circumstances, he finds himself in the midst of a Venerian revolt and succeeds in making his way to Venus. A friendly dragon nicknamed Sir Isaac Newton—a Chinese tavern keeper—a delightful damsel—some guerilla fighting in the fog and much of Venus—all get into the story, along with a certain much-sought-after dime-store ring. There is not quite the elaboration of background detail that Heinlein put in his earlier books, but it's all very smoothly and logically put together. As I've said before; buy it for a teen-ager and read it yourself.

BULLARD OF THE SPACE PATROL by Malcolm Jameson. World Publishing Co., Cleveland. 1951. 255 pp. $2.50

The series of "Bullard" stories which the late Malcolm Jameson wrote for Astounding SCIENCE FICTION between 1940 and his death in 1945 were among the most popular stories of the time. Now seven of them, carrying John Bullard from his Lieutenancy on the *Pollux* to the position of Grand Admiral, are assembled in a book published as a "juvenile"—in this case for teen-agers. It is about as juvenile as Robert Heinlein's series for Scribner's.

Basically these are space-opera adventures with situations much like those in Nelson Bond's exploits of Lancelot Biggs, but the two series are hardly in the same category. Malcolm Jameson drew on his years of experience as an officer in the United States Navy to give his Bullard tales—from the memorable "Admiral's Inspection" which introduced Bullard and opens the book to the snafu of "Orders" and "The Bureaucrat," which close it—a warm atmosphere of reality. The solutions Bullard and his fellow officers work out for the tangled predicaments which befall them are believable and logical—not hauled out of a top-hat with a twist of the auctorial wrist, as has long been the fashion.

Andre Norton, who has edited the seven stories for teen-age readers, has

done them little if any harm in the process. You will enjoy them, and if young people are going to be introduced to science fiction with stories of this kind, we need have no fears for their taste and standards in the future.

THE PUPPET MASTERS, by Robert A. Heinlein. Doubleday & Company, New York. 1951. 219 pp. $2.75

Robert Heinlein's first adult novel in some time has appeared in the Doubleday Science Fiction series while its serial version has just started. It is not in a class with such of his shorter work as is appearing in Shasta's "Future History" series—"The Man Who Sold the Moon" and "The Green Hills of Earth"—but can stand with any of the other serialized novels which have appeared this year except, perhaps, John Wyndham's "Day of the Triffids."

The extraterrestrial slugs which are the antagonists in this story might be considered more primitive ancestors of the symbiote in Hal Clements' memorable "Needle." They attach themselves to a human host, penetrate to his nervous system, feed on his life forces, and make of him a humpbacked puppet driven to trap and "seed" other hosts for the parasitic masters. These, by the way, are the pilots of the Flying Saucers of recent—and undoubtedly future—fame.

The story deals with the efforts of Americans, led by an underground intelligence organization, to discover the nature of the invaders, find their vulnerable points, and defeat them. "Sam Nivins," hero of the story, is for a time a victim of the slugs, but is able to turn his experiences against them. And as might be expected, there are wheels within the fast-turning wheels of the plot, so that an unexpected weapon against the parasites at last appears.

Somehow Sam's infestation comes too soon to give the story the suspense it might have; somehow a few of the book's other climactic situations seem to be telegraphed. This may be because Heinlein has worked out his background and postulates with his usual meticulous attention to detail—so meticulously that one can reason out the nature of the slugs before the protagonists seem to do so.

SPECIAL REVIEW

SPACE MEDICINE, The Human Factor in Flights Beyond the Earth. Edited by John P. Marbarger. University of Illinois Press, 84 pp. $3.00

This is an edited transcript of a symposium held at the Professional Colleges of the University of Illinois in March 1950. It may be a surprise to many readers that the United States Air Force has and maintains a

Department of Space Medicine, but such a department is no longer science fiction, it exists as a subdivision of the United States Air Force's School of Aviation Magazine at Randolph Field, Texas.

If the chapters of the book are in the same order in which the lectures were delivered at that symposium there was a short opening speech by Major General Harry G. Armstrong, outlining the short history of the School of Aviation Medicine. It was created in 1917 and if you think of it now as a child of the Air Force you have the odd case that the child is older than its parent. In 1917 the Air Force was a part of the Signal Corps.

After that Professor Dr. Wernher von Braun delivered a lecture on "artificial satellites." Not medicine, obviously, but one of the best chapters in the book. Dr. von Braun did not deal with the small unmanned orbital rocket which will not present any medical problems, but with the manned station in space. Since nobody can tell yet whether the apparent absence of gravity on such a station will cause physiological harm or not, von Braun's preliminary design sketch provides for pseudo-gravity by way of centrifugal force. It is a large doughnut which rotates, the outer rim serving as a floor. Power is to be provided by a curved mirror heating a water boiler so as to avoid the shielding troubles which would arise if a nuclear reactor were used. The outer "doughnut" which looks very much like a ring formed by twenty Pullman cars is to consist of plastic so that the sections can be carried collapsed in the hold of ships. The discussion is based on ships with a payload of thirty tons which would be three-stage ships, two hundred feet tall at take-off with the largest diameter sixty-five feet. The two-hour per revolution orbit some one thousand forty miles above sea level is advocated.

The next lecture, by Dr. Hubertus Strughold of the Department of Space Medicine dealt with life under extraterrestrial conditions. Dr. Strughold examined only the two most important factors, temperature and oxygen pressure. He came to the conclusion that there is, in all probability, lichenlike plant life on Mars. And possibly on Venus too, but unfortunately the surface conditions of Venus are still unknown. A factor which, I think, should have been stressed or at least mentioned, is that Dr. Strughold operates with the concept of terrestrial life on Mars. What I mean is he investigates how life which evolved *here* would do *there*, but life which evolved *there* would have developed certain abilities, hardly needed on Earth, to a much greater extent.

Dr. Heinz Haber's lecture—he is also of the Space Medicine Department—on "Astronomy and Space Medicine" dealt with acceleration and similar concepts and then paid

special attention to the various types of radiations emitted by the sun. Colonel Paul A. Campbell treated the problem of "Orientation in Space," but not the engineering problem of finding out whether your ship will intercept the orbit of Mars at the time when Mars is actually there, too. It is the problem of the orientation of the human body without any aid from the natural balancing organs but just visually.

The last lecture was that of Dr. Konrad Buettner—also of the Department of Space Medicine—on the "Bioclimatology of Manned Rocket Flight." The assumption was flight at the relatively low altitude of one hundred twenty miles, in a temporary satellite orbit. It turns out that the danger is not—attention, story writers of the past—that the crew would freeze to death but that it will easily get too hot. Even the "metabolic heat" of the crew is enough to warm the cabin. To get some convection at all—disregarding electric fans—the wall temperature should be kept at freezing point. As regards respiratory air for trips of just a few days duration, conditions resemble those well-known from submarines.

A fine book! But what will fascinate many science-fiction readers most is that problems they know from stories are discussed here as seriously and matter-of-factly as another commision in the same town may have discussed the building of a highway.

WILLY LEY

THE ANALYTICAL LABORATORY

One of the radio manufacturing companies I know of tests its new proposed production models by installing samples in various homes, leaving them there a month or two, and then asking the homeowners to express opinions. The verbal opinions so gathered are studied with interest—but the real test, the real evaluation indication, is the reading on the running-time meter concealed in the set. How many hours did these people actually listen? They *say* they like it—but did they *use* it?

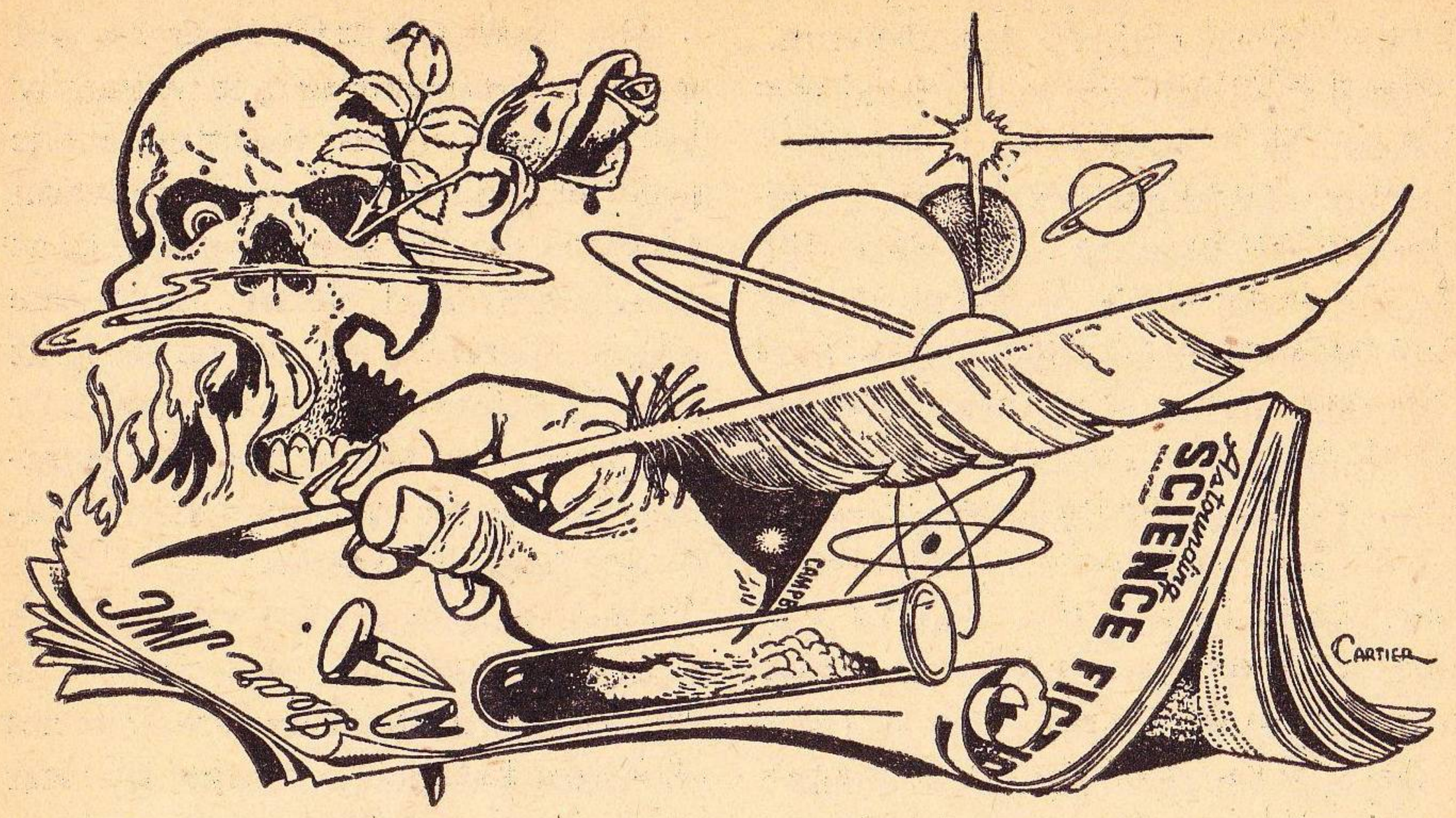
I'd like to be able to install some sort of remote-reading running-time meter in every copy of the magazine; until such a device can be worked out, I have to go by expressed opinions. The December issue concluded our first serial in some time—and here are the scores for that issue.

DECEMBER, 1951 ISSUE

Place	*Story*	*Author*	*Points*
1.	Iceworld (Conclusion)	Hal Clement	2.00
2.	Dune Roller	J. C. May	2.20
3.	The Edge of Forever	Chad Oliver	2.53
4.	Hell's Pavement	Irving E. Cox	3.13

The only conclusion I can draw: Readers do *not* like having to wait between serial installments—but they *do* like the stories!

THE EDITOR.



BRASS TACKS

Dear Mr. Campbell:

In your November ASF I read a letter by a Mr. Clyde E. Corson who stated that the teen-agers should "cut their teeth elsewhere" and then come to your magazine for mature reading. First, I started reading ASF when I was eleven and am still enjoying its sensible stories at the ripe age of fourteen. Though Mr. Corson is right about ASTOUNDING being the finest and most thought-provoking science fiction magazine on the newsstands now, I disagree with him about letting younger science fiction readers start on the cheaper magazines in the field. Many who read those never get as far as ASF, but stay in fantasy space-opera stage because they have never had contact with the finer science fiction magazines.

I am glad to see the appearance of serials on your pages, and especially "Iceworld," by Hal Clement, who I happened to meet a few months ago attending a skyshow at the Hayden Planetarium.

As for art in your magazine and you certainly do have fine illustrations, I would like to see Cartier do more of his imaginative drawing and as for Mr. van Dongen, he is a marvelous illustrator and his cover of October illustrating "Iceworld" was magnificent.

Let us hear more of Heinlein and

Asimov. And a few articles on astronautics would be greatly appreciated.

In the October issue you printed a very good story entitled "The Head Hunters," by Ralph Williams. In the last paragraph of that story the hunter, S. W. Neely, thinks of naming the extraterrestrial being he has killed Neeliana extraterrestrialis. First, it would be more correct to use a masculine ending for Neeliana, as Neelianus or Neelius, and as for extraterrestrialis, the biology of the animal is not shown. Extraterrestrialis is pretty vague as to what the animal is.

Why does ASF ship their copies folded? You must understand the annoyance a reader suffers when they must flatten out their issues under mounds of dictionaries or stacking an encyclopedia on ASF for six days before they can get at the stories. Please, why can't you ship them flat in manila envelopes? Broken backs or no broken backs a crease in the center of a page makes reading difficult.

Your magazine besides having fine science fiction has some of the best race psychology and humanics expressed in your stories that I have ever read, seen or heard about. Congratulations for publishing that long string of Dianetics articles.—Jon Borgzinner, 975 Park Avenue, New York 28, N. Y.

He uses that encyclopedia for purposes other than magazine flattening, I suspect!

Dear Mr. Campbell:

Mr. Hubler is entitled to his own definition of intelligence, of course, but I hardly think that entitles him to pick at Mr. deCamp's definition, which is currently the only satisfactory, functional definition: "That which is measured by intelligence tests." In these terms—deCamp's—a guy who is below the top one percentile of the population will have a fairly tough time getting anywhere as a "scientist."

While I agree wholeheartedly with Mr. Hubler that it's a shame that not all bright kids get to college, I hardly think his figure for expenses of six thousand dollars a year is reasonable. I managed to spend four years at Yale —not the most economical of colleges —and a year at a couple of other places, without knocking myself out and without getting much of any outside help, all on a total of five thousand dollars. I shall still have my Ph.D. when I'm 25, in spite of the fact that I've done everything wrong that I possibly could, and spent a year and a half out of school altogether. (The wrong things were getting my bachelor's degree in the wrong subject, not working hard enough to get good grades and be offered graduate fellowships, and even being thrown out of school at one point.)

The factors of memorization rather than "creative training" and excess specialization are the two great problems that beset our educational insti-

tutions today. Nevertheless, it is impossible to be a scientist, without being, at least in your own field, relatively rational, reasonable and judicious. That the scientist should be called less reasonable than his fellow men because his education has not been broad enough to enable him to outdistance them in every area of knowledge, is absurd.

To blame the current world crisis on "scientists," as a class, is equally absurd. It is not the scientists, not even the great political leaders, who have thrust us into our current dilemma—it is the common people—the salt of the earth—the ones who have "common sense"—who call the scientists "mad" in the same breath as they cry for the blood of those whose morals differ from their own, the blood of those who have come from a different part of the earth, the blood of those who desire the same things but call them by different words—who have no more knowledge of their universe than dogs, and who have far less insight into themselves. The scientist may be a fool about himself—which is rare—but at least he is not a fool about *everything*. It is the scientist and only the scientist—in the broad sense of the word—who can know the consequences of his actions.

Of course the scientist's creed is unforgiving and rigid—he is limited to "real" phenomena. Nor can a scientist, *qua* scientist, have an end or a telos or a morality. *Qua* man, however, he is far more likely to know what things are known, what things are unknown, and what things are subject to ethical choice. I hate to mention such a shop-worn observation, but the great wars of history, from the dawn of history until the one that ended in 1945, have been fought between contradictory moral beliefs, not contradictory scientific beliefs. Granted that the scientist supplies some of the tools of war—but is he any more to blame for this than the poet who writes a battle hymn? In fact the poet is far more to blame, for while he is glorifying the absurd suicides of young men, the scientist is striving for peace—if for no other reason than that war interferes with the free intercourse so essential to scientific progress.

Granted also that at the moment the direction of education and science are toward specialization and away from the whole man, still scientists and educators, as a whole, are beginning to see the problem, and beginning to do something about it. But considering the complexity of the knowledge of our time, it is only some sort of "pseudo-aristocracy" or "scientific tyranny" that holds any real hope for the survival of culture—or the survival of man. Or does Mr. Hubler have some way for us to eliminate the destructive—and constructive—knowledge that man has so far amassed?

It seems that Mr. Hubler's chief complaint is that the scientist strives for godhead without quite making it.

Surely the fact that in the process he is used and misused is no discredit to the attempt. Then are the scientists being berated because they are not—gods?—Henry Kyburg, Jr., 105 St. John's Place, Brooklyn, New York.

The failure must be laid not at the door of the physical scientist, who tends to be the "scapegoat," because his efforts produce visible results, but at the door of the non-physical non-scientist. The sociologist who seeks to understand Mankind, and the psychologist, who seeks to understand individuals, have both failed. The unfortunate fact is that the effective efforts of the physical scientist have put control of unstable nuclei under unstable minds the psycho-sociologists have not learned to control.

Dear Mr. Campbell:

In the far off places it is a pleasure to finally receive some copies of science fiction magazines—especially ASTOUNDING. Here in Korea and also in Japan they are quite a scarcity. I have been in both areas for a year now and found very few. Luckily I have some faithful friends in the States that have been kind enough to fill my requests for ASTOUNDING SF.

I just recently finished the July, August and September issues and enjoyed most all the stories. Mainly in the September issue "Day of the Moron," a very understandable and timely tale.

I have spoken to many other SF fans in our organization who also are having troubles obtaining SF material. We would appreciate it if you could tell your readers who have excess or not wanted copies of SF magazines to send them to the address given below. They will really be appreciated by a bunch of guys in Korea. Also any information you can give me on how to get some back dated issues from '48 back.—Cpl. Dani A. Pesak, Hq. Sq., 51st ABG, APO 970, c/o PM, San Francisco, California.

There are other groups overseas who

could use your back copies. It's a bit of a nuisance to mail them, of course —takes a few minutes—but the magazine, at the other end of the trip, means a lot more than it does here. Under the circumstances, throwing them away is a waste of a real resource.

Dear Mr. Campbell:

Somewhat belatedly, I'd like to comment on Daniel Whitton's brief article, "No Green Cheese," which appeared in your September issue. The idea it presents is ingenious and could be put to good use in a story, but—like a much better known hypothesis of Fred Hoyle's—it's a good deal more spectacular than it is tenable.

The first and most obvious objection to it is that, were large areas of the Moon covered with a deep layer of liquidlike material, we should be able to see the arrivals, and maybe even the after-effects, of large meteors. Even if we suppose that the electrostatic charge of the dust particles, and their small size, permits the dust "seas" to behave very much like water, we should be able to see an occasional splash. After all, the Earth takes in about 3,000,000 meteors a day; the number arriving on the Moon can't be significantly smaller.

There is good reason to think, also, that the lunar dust *doesn't* flow like a liquid, but instead holds its shape, and thus tends to preserve impact craters. For instance, there is in the crater Ptolemy a shadowy, almost obliterated crater about ten miles across which looks as if it were gradually sagging back into a level surface —but the sagging is arrested; no change in it has ever been detected. The floor of Ptolemy is eighty-six miles in diameter and virtually flat, so if it is a dust-lake, that dust *doesn't* flow at any detectable rate.

Furthermore, reflection angles of sunlight from flat areas on the Moon seem to make it likely that "the smoothest appearing areas of the lunar surface are completely covered with small cuplike depressions" (Whipple). All in all, there doesn't seem to be much doubt that the arrival of a large, high-speed meteor should leave an impact crater in a "sea" of dust. The absence of such new craters is compatible with a layer of dust only a few inches thick, but incompatible with a "sea" miles deep.

A close blink-microscope study of the lunar maria should settle the question. Comparison by this method of an old photograph—say, the excellent Mount Wilson plate H 7, taken in 1919—with a modern shot would show up new craters at once, if any exist that selenographers unaccountably have missed.

Secondly, I seriously doubt the dynamics of the process of dust production as Gold and Hoyle visualize them. Thermal erosion is a painfully slow process, and it is dependent in

large measure upon the presence of water. Without water, or at least some water-of-crystallization, exfoliation of rock cannot occur, regardless of how extreme the temperature-changes may be. Since we have no evidence whatsoever of the existence of water in any form on the Moon, thermal erosion there would have to be limited to friction between rocks with different coefficients of expansion. There is no reason to believe that exfoliation takes place on the Moon at all.

It's fairly certain that some thermal erosion does take place. There is dust on the Moon, it seems, or at least a fair amount of pumicelike material; the great terraces in Tycho, Copernicus, and the Ptolemy-Arzachel-Alphons group look like rock-slides; the lunar Appenines also seem to show talus-slopes. Thermal erosion from friction alone could hardly account for even these features, in my opinion. Probably one would have to invoke also the continual meteor bombardment to account for even a thin layer of finely-divided dust. Seas of dust four miles deep are something else again, and something I'm tempted to call dynamically impossible.

Finally, when you tie in thermocouple and radio-emanation studies of the temperatures on the Moon, the whole hypothesis comes apart at the seams. Whitton invokes the "great change of temperature of the surface rocks" when the sun rises on the Moon as the source of the thermal erosion. But how does he know that the changes of temperature are taking place in the surface rocks? The evidence points exactly in the other direction. During a lunar eclipse, for instance, the temperature in the umbra drops from 160 F. to −110° F. in less than an hour. Could a mass of heat-conducting material like granite, a mass that had been heated furiously for several days prior to the eclipse, lose calories this rapidly?

Obviously not. Only an insulating material, like dust or pumice, could go through so rapid a change. The rocks beneath that layer must heat up and cool down much more slowly—and, consequently, could not undergo thermal erosion at the rate required by Gold's and Hoyle's theory. Even if you allow Gold and Hoyle their actinic charging of the dust particles—which seems quite reasonable—there simply has not been enough elapsed time to allow for the production of as much dust as they require.

All in all, I'm inclined to think that there isn't quite as much dust under Selene's bed as the boarders allege.—James Blish.

In any case, Moon-dust will not trouble asthmatics!

Dear John:

Arthur C. Clarke of the British Interplanetary Society is a friend of mine—but I can't let his statement in the Brass Tacks column of the December 1951 issue go by without a remark or two. Arthur emphasized, in his reply to Daniel Whitton, that it is not generally agreed that the lunar craters were caused by meteorite impacts and added: "I don't know any serious lunar observers in this country (England) who believe it." That this attitude prevails in Great Britain has become apparent to me by some of the reviews of the British Empire edition of "Conquest of Space" in British magazines.

But that the British lunar observers refuse to recognize the lunar craters as impact craters has little bearing on the facts. Three hundred and fifty years ago there was somebody who refused to look through Galileo Galilei's telescope for fear of seeing the four large satellites of Jupiter. That did not eliminate their existence.

Now a volcanic crater is characterized by a generally conical shape with a comparatively small hole at the summit. If the crater has been inactive for a long enough time to have eroded away, that hole may be enlarged and the slope from the crater to the rim and the slope from the outside to the rim will be very much alike. The bottom of even the eroded crater is likely to be quite high above the surrounding territory.

Impact craters, on the other hand, show a very large hole when compared to the size of the ringwall. The slopes of the ringwall are rather gentle on the outside and quite steep on the inside. And the bottom of the crater is considerably below the level of the surrounding territory.

In dimensions, relationship of their various measurements et cetera, et cetera, the lunar craters show a very strong resemblance to terrestrial impact craters like our Canyon Diablo crater and the recently discovered Quebec crater. Lunar craters, except for a few very minor ones, show no

resemblance to terrestrial volcanic craters, even after erosion has gone to work on them.

I don't know whether those serious observers cling to the volcanic hypothesis just because it is traditional. But I strongly recommend to them that they have a good look at an impact crater one day before they settle the nature of the Moon according to tradition and precedent.—Willy Ley.

Also, it might well be questioned what could have eroded volcanic craters if any had been formed. Present knowledge of gas-molecule kinetics and gravitational field energies, plus solar radiation effects, show that the Moon could retain sulfur dioxide as an atmosphere; sulfur dioxide is a typical volcanic gas. Such immense volcanic activity would have produced abundant SO_2; but the Moon has no atmosphere.

Dear Mr. Campbell:

Since you feel that Mr. Hubler will be assailed for his statements in your column anent scientists, I am conscripting myself to join forces with him and will state my views.

Perhaps such scientists as I have met have not been typical. They have had a common denominator, however, in their unsymmetrical development.

Technology unintegrated with sociology is at best a ghostly framework, at worst a vicious, degenerate influence upon mankind.

The concept of total effect is apparently lacking in the so called "scientific approach," perhaps because science, as such, has no basic goal.

This "head in sand" attitude, excluding humanity from the scene, leads inexorably to the subjugation/elimination of humanity by scientific implementation.

As Mr. Hubler has pointed out, certain scientists are becoming alarmed

at the long term prospects. These are the intelligent ones.

Perhaps mankind *is* unworthy of consideration in the abstractions of science. In that event, why all the bother?

The greatest scientific achievement to date—atomic energy—finds its primary outlet as a super destructive force. The defense rests.—Alvin J. Jarvis, 11023 Third Ave. N.E., Seattle, Washington.

Your over-all point is valid—but do not blame "scientists." Allocate the failure to the specialists who are responsible; if the liner runs aground, we do not blame the chief engineer, but the navigator who miscalculated the course. In our present culture, when a physical scientist seeks to comment on the work of the navigators—the psychologist, sociologist or statesman—he is requested to mind his own business, and leave the direction of civilization in the hands of the experts. Allocate responsibility more definitely than "scientists." Albert Einstein has been repeatedly "told off" for daring to venture a sociological opinion.

URANIUM'S NOT SO DEADLY AS . . .

Hunting uranium ores is becoming a minor industry of the Colorado Plateau country. Uranium — the radioactive stuff that makes bombs. It's not half as deadly to the prospector as another factor, however.

Uranium is hunted by two methods; by the fact that most uranium minerals fluoresce vividly under ultraviolet light, and by Geiger counter detection of its radioactivity. Geiger counters work day or night; the fluorescent system can be used only at night. Nighttime searching through rugged mountain territory does not ordinarily lead to radiation burns, but does lead to broken arms, legs, or necks. It also, in that area, leads to another hazard.

Geiger counters, while permitting daylight search, tend to expose the user to a little difficulty you might not have considered. The J. A. Batson Electronics Corporation has announced a new portable, prospector's-type Geiger counter *with loudspeaker*. Seems most of the portable prospector's Geiger counters have used earphones. (It takes less power to run an earphone.) And it seems that, when using earphones, the prospector can't hear the buzzing rattle that all Western prospectors must learn. Rattlesnakes aren't radioactive, but day or night they're dangerous!

THE LONG AUGUST NIGHT WAS HOT—but not as hot as the bitter fighting that raged about Agok, Korea, in the Naktong River area. Sergeant Kouma, serving as tank commander, was covering the withdrawal of infantry units from the front. Discovering that his tank was the only obstacle in the path of an enemy breakthrough, Sergeant Kouma waged a furious nine-hour battle, running an eight-mile gantlet through enemy lines. He finally withdrew to friendly lines, but not until after his ammunition was exhausted and he had left 250 enemy dead behind him. Even then, although wounded twice, he attempted to re-supply his tank and return to the fighting.

"A withdrawing action is not my idea of how Americans should fight," says Ernest Kouma. "If we must fight, let's be strong enough to take the offensive. In fact, *if we're strong enough*, we may not have to fight at all. Because, nowadays, *peace is for the strong*.

"So let's build our strength—to keep a strong America at peace. You can help by buying Defense Bonds—as many as you can afford. It's far less painful to build for peace than to destroy in war. And *peace* is what you're building when you buy Defense Bonds."

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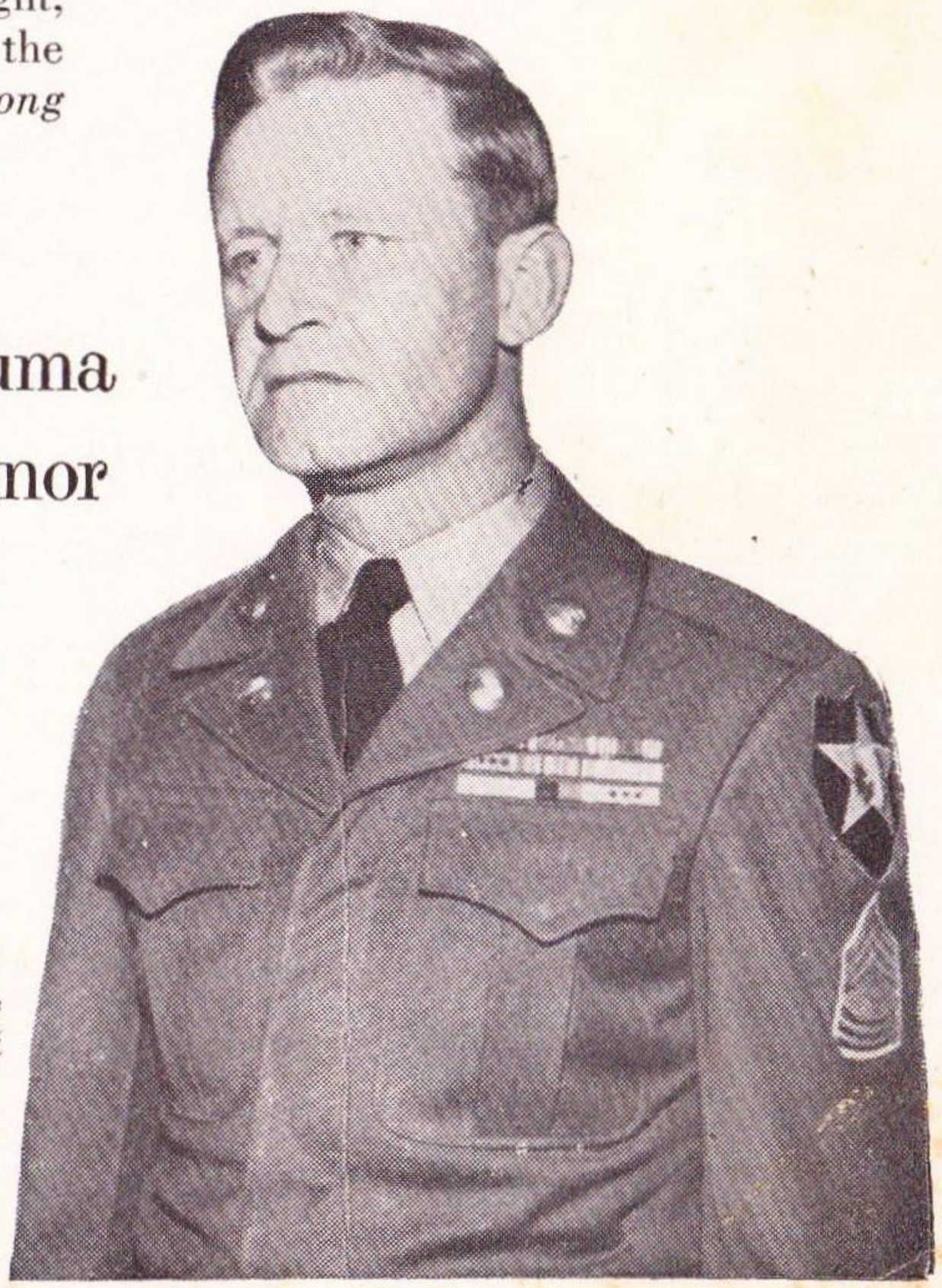
M/Sgt. Ernest R. Kouma
Medal of Honor



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