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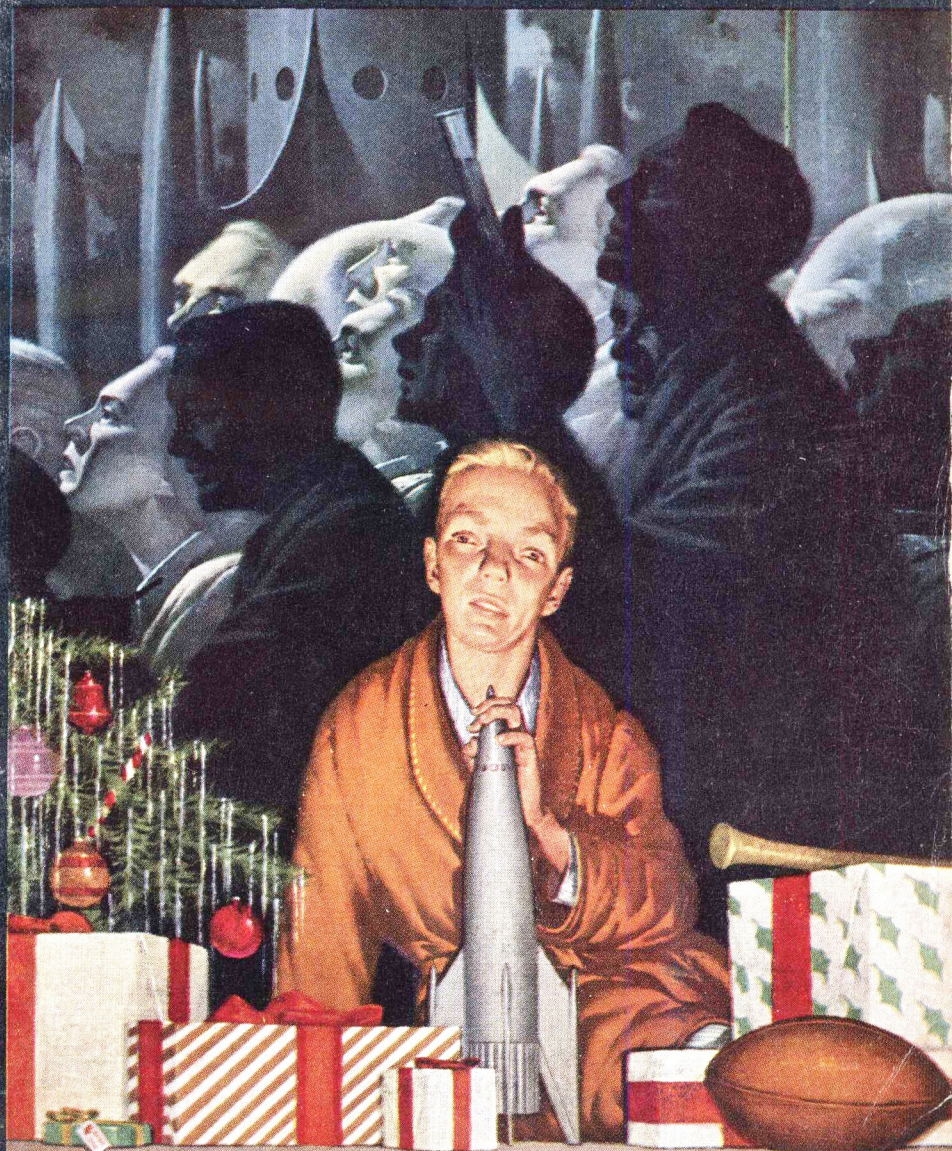

Exile BY EVERETT B. COLE

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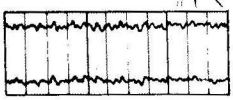

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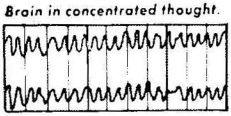

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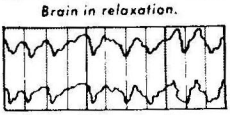

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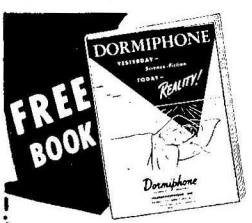

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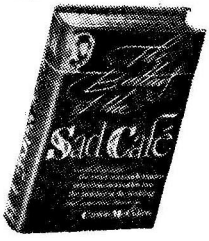

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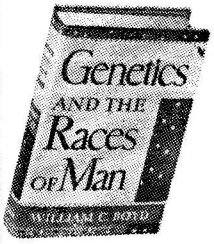

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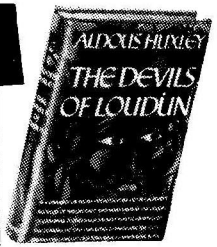

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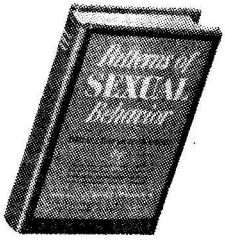

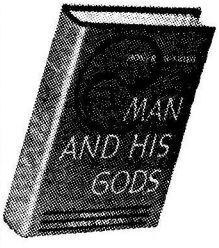

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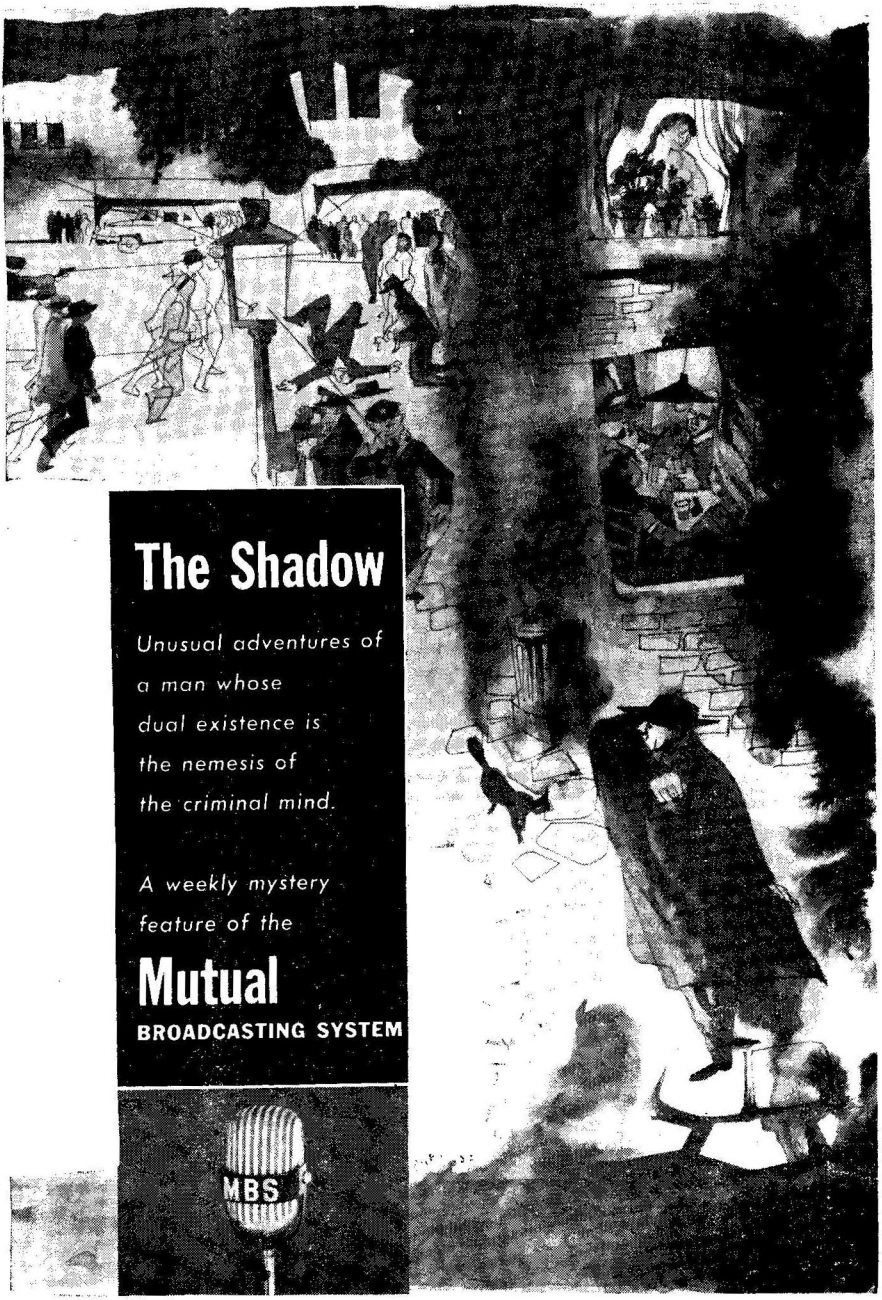
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EDITORIAL

HELL ON EARTH

Earth is, I think, properly rated as a hell-planet. I have a hunch that about eighty per cent of Earth's history is the direct and indirect result of one single factor: the Earth is at such a distance from a sun of such magnitude that its principal liquid, water, is very close to its phase-change temperature.

Imagine, for a moment, the situation of a planet generally similar to Earth, but at such a distance from such a sun-star that the equatorial temperature was 150°F. and the polar temperature was about 50°F. Earth has fish and plants that live in hot springs at temperatures of 180°F., so such temperatures are thoroughly comfortable to life as we know it.

Earth's liquid-gas system happens to be the absolute ultimate tops possible in the Universe for sheer corrosive virulence; nothing can match the oxygen-water system. Florine-hydrogen floride isn't anywhere near as bad, because the hydrogen floride has much less corrosive power, and much less solvent power. This makes Earth's atmosphere-hydrosphere particularly hard on the surface geology of the planet.

The fact that water expands on freezing makes things worse; it gets into cracks in the rocks, and, because the planet is so near the critical phase-change temperature, has a chance to freeze and crack the mountains apart.

More important, though, is the large-scale effects of that phase-change phenomenon. Being so near the phase-change temperature, the annual variations produce the violent change over large areas of the planet. It makes an atmosphere unstable to have a cubic mile of its substance collapse into a few hundred cubic yards of solid or liquid. Ask anyone who's experienced a tornado or hurricane.

But every now and then, there is, for some unknown reason, a long-term variation of heat received on the planet; then, because of that critical

phase-change situation, things really go haywire!

Anywhere from five to twenty million cubic miles of water is abstracted from the oceans, and deposited on the land surfaces in solid state.

This is exceedingly hard on the geology of a planet. The quintillions of tons of water-ice crushes the surface rocks down, while the ocean basins, relieved of the load, tend to rise. The resultant stresses have been well pictured by Norse mythology. They know it will happen again—the gods will fall before the Frost Giants, marching in solid ranks, standing a mile high in great columns and masses, while the Fire Giants spew lava on the land before the great advance—and the Fimbrulwinter settles in for another few hundred millennia. The Earth will rock, and the mountains heave. The rate of the Earth's rotation will change as vast masses of water are shifted from the equatorial oceans, where they have large angular momentum, to the polar caps, where their angular momentum is small.

Then, when the place warms up again, the rocks will groan and heave, and the mountains will be forced into still newer configurations as the Fimbrulspring sets in.

But that's just what happens to the geology. Since rocks and minerals don't have much in the way of opinions, they don't mind. The living creatures of the planet, however, *do* mind. When the ice comes, the squeeze goes on from north to south; willy-nilly, the animals and plants are forced toward the equator. Willy-nilly, they have to invade the territories already held and defended by other ecologies. They've *got* to fight for a new homeland, because the old one simply isn't there any more.

In the course of the time an ice age lasts, a new balance is reached; a new stability and a new system of ecologies.

Then the ice melts and the squeeze is on again—only this time it is an east-west squeeze. The continental shelves, exposed when the waters drop four hundred to six hundred feet, are flooded. The coastlines move in hundreds of miles; vast inland seas are formed. Let's suppose the whole central United States, for example, is flooded from the Gulf of Mexico up to the Great Lakes one Fimbrulspring.

The nicely re-balanced ecologies living creatures had established during the Fimbrulwinter are promptly stirred around by a cosmic mixmaster.

The Holy Men of India regard it as a high and noble thing to sit, unmoving, in some city square, twenty-four hours a day, three hundred sixty-five days a year, naked and simply contemplating the whichness of the why. No one has ever tried this in Oslo, so far as I know, though it's quite popular in Calcutta. It isn't popular in Berlin, London, or Duluth, either.

Continued on Page 161

EXILE

BY EVERETT B. COLE

By his own acts he got into trouble. Getting out meant some very touchy balancing between permanent exile, and the ruination of a whole race!

Illustrated by Kelly Freas

Empress Miralu Street was one of those old streets which have outlived their usefulness, but continue to lead a half-life—known to many, used by a few, avoided by most. The buildings were still standing and occupied. There were a few cheap apartment houses, some stores, and a tavern or so. The aged cobbles were still there—rough, to be sure, and moss covered—still defying time, wear, and progress. The old-fashioned central drain was still in the street, its ever persisting debris and moisture nourishing the few discouraged blades of grass. The street lights, foiled by the darkness and fog, merely picked up a few vague shadows and highlights from the damp cobblestones, and accentuated the black

voids among the shuttered buildings. Overhead, there was a thin line of sky between the overhanging roofs, but the stars hid behind the fog, and the faint glow was lost before it could reach the street.

Once, Empress Miralu Street had been a main thoroughfare, leading from the Castle Gate to the City Market, but the old market was hardly used, and the streets to it were outmoded and virtually deserted. Of course, there were faint bursts of merriment and song which barely registered on the ear, to tell of hidden activity. Somewhere, shrill voices raised in a quarrel, and there was a crash and the tinkle of glass, but all this was barely audible above the footsteps of the lone pedestrian and the voice of the other, newer city beyond the old city wall.

He walked along, looking at the dark houses as he passed. By now, he could guess quite easily as to what lay behind the closed shutters. A little way ahead, a few rays of light glinted for a moment through the fog, making a darkly glittering streak across the damp cobblestones. Then, the shutters were closed again, and the street regained its tenebrous mystery. But there was no need of inductive reasoning to guess at the scene within. He was familiar with many of the city's taverns and night clubs. He reached into his jacket, then changed his mind. No, he thought, it was not really necessary. There was no need to supplement his normal mentality now.

It was just about time to leave. He had become familiar with Bardon by now—maybe a little too familiar. He knew he should call in his ship, make up a little more precious metal, and go to another country, to round out his knowledge of the planet. He looked back toward the glow beyond the walls of the old city. The city, its museum, its library, these had given up all the secrets they had to offer. He smiled. So had some of the people in them—and that without recourse to artificial aid. It was time to move on and get more data. He shook his head as he thought of the errors he had made in his first attempts at analytic work. No wonder he had been told to revise.

Suddenly, he noticed the slight mental tension. It had been there for some time, but he had let it remain unnoticed. His hand went to his belt, but he was late. The roof tile was heavy, it was falling fast, and it was near. The field of force built up, but there was insufficient space and time for more than a slight cushioning—a distribution of the impact. He felt the jar, then the clouds and the fog parted, and the stars shone brightly for an instant before they blinked out and absolute darkness closed in. He collapsed to the pavement, a convulsive jerk of his hand turning the shield off. There was a little crash as the tile fell beside him, then the street was quiet for a time—until Gorfaer hurried from his doorway.

Gorfaer's boots made a muffled clatter as he rushed to the body. For a moment, he stood, looking down, then he chuckled approvingly at another perfect job. He had finally discovered a safe, easy method of robbery. He looked at the rooftop, where he knew the Tosser was watching. Then, as he heard the faint sounds of his partner's scrambles, he bent to the business of the evening. Quickly, he went through the victim's pockets, then examined the rest of the clothing for objects of value. He removed the circlet from the jacket, looking at it curiously. He took the purse, the little ornamented control panel, and the belt with its ornate buckle. He also removed a watch and other minor items of value. Finally, satisfied that he had left nothing, he rose to greet the smaller man who approached.

"Got everything," he announced. "Let's go."

The two dodged up the street and into an alley. They cut through another side street, and finally came to their lodging.

As they entered the room, Gorfaer tossed the circlet carelessly to his pallet. Then, he lay down, flexed a knee, crossed the other leg over it, and fell to examining the loot more closely. The purse was satisfyingly heavy. It gave up several coins and a wad of notes. Gorfaer counted these.

"Well," he commented happily, "almost two hundred crowns. Not a bad night's work, eh, Tosser?"

The other sidled up eagerly, reaching for the money, but Gorfaer pushed him back roughly.

"Not so fast," he growled. "I'm not through yet. You'll get your split." He quickly laid the purse on the side of the pallet away from his comrade, then took the small ornamented box from his pocket.

"Hm-m-m," he observed, "a puzzle box. Be worth something if we can figure how to open it."

He examined the box closely. It shone with a dull, silvery luster. Five sides were ornamented with fine engraving, but the sixth had several small buttons and a knob. Curiously, Gorfaer pressed a button. Nothing happened. He leaned back again, then pressed another.

Suddenly, he seemed to be looking at the ground far beneath. He could see the brown of fields and the green of trees. Tiny buildings lay at the edge of the forest. He shook his head, and pressed the first button again. The ground slowly moved beneath him. He pressed a third button, one of the three which were grouped together around the knob. Now, he seemed to be falling. Again, he shook his head. He could still see the room. The Tosser's ugly face looked at him with its usual surly, demanding expression, but at the back of his mind was that scene of a forest coming up at him with alarming speed.

Gorfaer started to rise from his pal-

let, and the scene faded. As he sat up, it disappeared. Again, he lay down. Now, the trees were reaching up for him. As he started to rise again, he had an impression of sudden flame, then the scene faded from his mind and was gone. Again, he leaned back. The circlet touched his head, and he became aware of an overpowering, eager hatred. He saw a fleeting vision of himself lying on a cobbled street beside a victim, whose face and figure were vague. His image was clear, as was the pool of blood at his—He started up again, feeling the circlet against his head. Angrily, he seized it, dashed it to the floor, and stamped on it.

The power unit in the mental-force amplifier used by many citizens of the Galactic Federation is far from a fragile little mechanism, but it is built for normal handling, and within its tiny shell it carries and controls immense force. Its size doesn't permit too much protection against heavy shocks, and this communicator was no stronger than most. The heavy boot struck at a critical spot, the light metal bent, and insulation cracked. Two tiny filaments touched, the accumulator discharged, and a magneto-gravitic field built up and suddenly collapsed as its generating force was exhausted. There was a brilliant flare and a concussion.

From the other side of the room, the Tosser had time to feel a strange tension. He even saw the beginnings of the flare, but his world ended before he felt the concussion. Gorfaer saw nothing, heard nothing, felt nothing. He simply ceased. No one in the room was aware that the outraged power unit in the stolen body shield had added its discharge to the sudden inferno. No one outside the room ever knew any of the details of the occurrence, though one person was able to make a close guess much later. Light-years away, an indicator moved slightly, recording an unexplained impulse somewhere in an unexplored corner of the galaxy, but it was many years before resultant actions noticeably affected any person in Bardon.

The explosion, the sudden glare, and the fire attracted the citizenry from their evening activity. They came from the bars, from their homes, from their occupations. The crowd watched the flames, and asked one another what had happened. Firemen appeared, and the city protectors. The fire was put out and the firemen went away, leaving the protectors to keep the crowd of curiosity seekers from picking over the smoking rubble before the squad of investigators could arrive.

Back in Empress Miralu Street, the explosion dislodged a few more roof tiles. They crashed against the cobbles, and the figure in the street stirred. He sat up slowly. His head ached, and the exertion of rising made his stomach protest vigorously. He got to his feet and staggered over to the nearest

building, then sickness overcame him. For a while, he crouched against the building, then the wave of nausea was over for the moment. He didn't wonder who he was, or where. He was merely a pain-filled being, who felt an urgent need to go away from there. Slowly, he staggered up the street, one leg dragging a little.

It was a routine call, so Horon stayed at the controls, while Patrolman Korr got out and went to the door. He punched the button and waited. There was a movement inside, then an elderly woman stood, looking at him.

"Did you call about a drunk, madam?"

The woman stepped back, revealing the prone figure of a man just inside the hall.

"He fell inside when I opened the door," she explained.

"Give you any trouble?"

"No." She seemed a little concerned. "He just fell inside and lay there. We couldn't rouse him and we weren't sure whether he was just drunk or whether he'd been hurt, so we called you."

There were several people in the hall. They looked at Korr, then they looked at the body on the floor. Korr glanced at them casually, then looked back at the woman.

"We'll take care of him," he promised.

He leaned down, shaking the prone figure. "Hey," he said sharply, "what're you doing here?"

The man twitched a little, but made no answer.

Korr shook him again. "Come on," he ordered. "Let's go."

There was no answer. Korr gave the figure another slight shake, then stood up, calling over his shoulder. "Hey, Vol, this one's really out. Gimme some help with him."

Together, the two protectors lifted the inert form. As they stuffed it into the patrol vehicle, Horon shrugged.

"That's the way to get," he commented tonelessly, "then, you forget all your troubles."

"Yeah?" asked his partner. "And the next morning?"

They got into the vehicle. Horon pushed the fuel lever, pulled back on the control bar, and they started down the cobbled street.

After a few minutes, the passenger roused a little. He raised his head, then shuddered at the pain of it. "What happened?" he asked.

Korr half turned. "Take it easy," he counseled. "You'll feel better tomorrow."

The passenger felt vaguely that there was something wrong, but he had no energy to argue, nor knowledge of what there was to argue about. He leaned back against the seat, watching Horon's easy driving. Then, the lights and buildings all merged into nothing again.

When the car stopped, he roused a

little. Again, Korr turned. "Think you can walk now?"

The man started to get out, then winced. "Head hurts," he complained.

Horon grinned. "So quick?" he asked. "Must've been some stuff."

The man hung back. "Where—?"

"Come on," interrupted Korr taking his arm. "Let's get inside."

The desk sergeant was elderly. The gloss was going out of his hair and some of it was changing color. He looked at the trio questioningly. There was another man in the room, but he was reading a magazine.

"Drunk," explained Korr. "Passed out in an apartment hall."

"Live there?"

"Uh uh." Korr shook his head. "They didn't know him."

The official turned to the subject. "What's your name?" he asked, picking up a pen.

"I am—" He raised a hand to his head. It just hadn't occurred to him to wonder who he was. Now, he put his mind to the problem, but it was too much. His head hurt. Anyway, he was himself. He was— His name— He gave up.

"I don't remember," he confessed. He stumbled to the bench and sat down. Korr started toward him, but the sergeant held up a hand.

"Never mind," he said. "What do you do for a living, citizen?"

The man pondered this question for a while. A living? Yes, he was alive. But why? What did one do for a living? Did one have to— He looked at his questioner. "I don't know."

The magazine dropped to the desk. Its reader looked disgustedly at the man on the bench.

"Why do these drunks always have to play dummy?"

Marnol Kastin had been sitting back of that desk for several years. Before that, he had walked many streets—had seen many people. He'd seen them sober, he'd seen them drunk. He'd seen them injured, and he'd seen them when they just weren't right in their heads. Now, he looked carefully at this one. The man looked about average at first glance, but he was evidently accustomed to healthy well-being. The sergeant remembered that he hadn't been exactly dwarfed by Korr and Horon, and those were big men. The face was smooth, a little slender, with regular features, which showed no sign of habitual strain or dissipation. The clothing was disarrayed, a little dirty, but of excellent quality. Kastin thought for a time, then decided that this wasn't some drunken floater.

"Better take him up and let the doctors look at him, Korr," he declared. "Maybe he's drunk, maybe he got hurt somehow. Might've been near that explosion over on Klewor Street."

The subject was only half conscious again. Dimly, he felt himself being helped into the vehicle. There was a bumpy ride, then the street was

smooth for a while. Finally, the vehicle stopped and he was half carried into another building. Another man asked puzzling questions. Then, he was sick again. Someone put him into a bed, and time ceased.

He was half awake. For a few minutes, he lay, enjoying the pleasant semiexistence, where there were neither pains nor problems, just the casual acceptance of sentient being. Then, a little question intruded. What had happened? A little throb reminded him of a headache. Idly, he tried to explore the past, to trace the little clues presenting themselves. Somehow, nothing was clear, and he concentrated his efforts, trying to reconstruct the past. With a mounting sense of urgency, he realized that something was very wrong indeed. At last, he recognized the noise that had awakened him as conversation. Eyes closed, he relaxed and listened.

"Couldn't tell 'em who he was or what happened, huh?"

"Didn't even know his own name. Like I said, there wasn't a thing in his pockets, either. Somebody'd cleaned him out but good."

"Wonder what happened."

"Dunno. Doc said he took an awful rap on the head. Wonder he—"

The voice was abruptly shut off as a door closed.

Slowly, he opened his eyes, looking over his surroundings. There were two beds besides his own, both with rolled back covers. Night stands stood beside the beds, cluttered with water pitchers, magazines, small bottles. The room was severely white. From an adjoining room came the sounds of running water and voices murmuring unintelligibly. He looked at the windows, where white curtains were drawn back to reveal the tops of a few trees and a large expanse of cloudy sky. A word crept over the threshold of consciousness. Hospital. That was it, he must be in a hospital. Again, he closed his eyes, collecting his thoughts.

Now, a few of the loose strands of thought came together. He could remember a dull thud, a tiny creak, as muscles reluctantly gave way to superior force. There was a moment of mental tension and an effort to turn something on. He tried to gather in more loose strands, but the incident was isolated and memory failed. What had happened, where it had happened, who was responsible—all these things were hidden in a muddled, hazy darkness.

That wasn't the problem, though. Somewhere, there was a real and pressing question to answer. Dimly, he could remember someone asking him about a name. He didn't know any name. He could remember some things. There were theaters, sporting events, crowds of people, but who was he? Did he have a name? What was a name? He realized he was going in a circle—tried to break out, to gather in more pictures from the indistinct mass of shapeless thought. Little snatches

of historical detail crossed his mind, but none of them concerned him personally. He knew them, but was not part of them. What was a name? Another word crept out of the haze. Of course! A name was an identity. He searched, but could find no identity. Momentarily, a large crowd appeared. They were sitting, but the surroundings were hazy. He tried to pick out details, but the crowd shifted, blurred. There was no one to whom he could point and say, "You know me. Who am I?" Now, he could think of other questions.

There were a lot of questions, but there was no answer. He looked over at the closed doors. There were people behind them, he knew. They would have questions, too.

"What's your name? Where do you live? Are you employed? Where? What do you do for a living? Where were you born? How old are you?" In short, "Here you are, but who are you? Account for yourself."

He shook his head. As far as he knew, he had no previous existence. But here he was, an undeniably solid person, occupying a bed, probably with records somewhere. He closed his eyes, concentrating on the questions.

In the other room, the water stopped running. There was a small clatter as the door opened, then a slight scraping noise told of slippers coming across the room. One of the beds creaked.

"Wonder if he'll remember anything when he does wake up?"

"Oh, I suppose so. Probably be pretty sore when he finds out he got cleaned."

He opened his eyes, looking at the ceiling, then allowed his gaze to travel about the room. The other beds were occupied. Both the men were looking at magazines, but one of them glanced over his way, then looked at him curiously.

"Oh," he commented, "you're awake. How do you feel?"

"Head—hurts." The answer was a little stumbling, slightly blurred.

The man nodded. "Guess it should," he remarked. "You were really out when they brought you in last night." He fumbled for a moment under his pillow. "By the way, my name's Neir, Damar Neir," he offered.

"Glad to know you. I'm . . . I'm . . . glad to know you. I—" The speaker forced himself to be quiet. What new problem was this? The thoughts were fairly clear, but when he tried to put them into words, it all seemed to come out wrong.

The man named Neir frowned a little, then started to speak, but the third patient had gotten out of bed. He tapped Neir on the shoulder and shook his head very slightly. Neir nodded, then turned again, pointing. "That's Mardon Pyl. He got hit by a car. Been here a couple of weeks."

"Where's . . . here?"

Pyl grinned. "Accident ward, City Hospital. This is the second time they've caught me." He paused. "Say,

suppose you just take it easy for a while, huh?" He turned back to his bed. Neir looked at him for a moment, then picked up his book again.

The door opened and a nurse came in. She looked at the three men, then centered her attention on the new patient.

"Oh," she said, "you're with us again."

She went into the corridor, returning with a doctor, who came over to the bed, looked at the chart, then drew a chair to the bedside.

"Let's have a look at you," he said. He adjusted his reflector, looking closely at the patient's eyes, then he nodded and reached for a wrist. After a moment, he released it. The arm dropped loosely on the bed. The doctor looked at it, then picked it up again, gently feeling the muscles and tendons. This time, he laid the arm on the bed gently, and looked closely at the patient.

"Close your hand," he ordered.

The fingers twitched, then hesitantly crept toward the palm—touched it. The doctor watched, then took the hand and flexed the fingers back and forth.

"Try it again," he instructed.

Again, the hand closed, reluctantly and loosely. The doctor glanced over at the nurse, who made a note on her pad.

"Now, bend your elbow."

The patient made an obvious effort, finally rising slightly on his other elbow, but the left arm stubbornly refused to move. The doctor watched the struggle, then waved a hand.

"Well," he said casually, "it'll clear up after a bit. Let's get some information about you. What's your name?"

The patient was looking at his arm. "It won't move," he said wonderingly. He worked the fingers of his other hand, then flexed the arm. "Funny," he commented, "this one's all right."

"We'll get it straightened out," the doctor reassured him. "Have you up and about in just a little while." He looked down at the form in his hand. "I'll have to get some information about you, though. Your people will be wondering where you are. What's your name?"

The patient looked at him. This was what he had been afraid of. He was supposed to have a name. He shook his head, then winced a little. "I don't remember," he confessed.

The doctor looked for a moment at the space on the form which said, "Name," made a short notation, then looked at the nurse. She was writing on her pad. He glanced at the patient again.

"I see. Do you remember the city?"

"Why, yes." The brows wrinkled into a frown of concentration. "I remember streets and houses. There's a big statue."

"Kelore Circle?" prompted the doctor.

"Maybe. There's a big library, too." The fingers of the left hand twitched. The patient looked at them intently. A corner of his mouth drooped, then straightened again. "I didn't sense him," he complained. "Somehow, he must have sneaked up without thinking."

The doctor blinked, then looked at the nurse. She was writing rapidly. He looked at his patient again. "Who was it?"

"I don't know. There was no contact." The man lay for a moment, frowning in a puzzled fashion, then made an impatient sound. "I just can't remember," he complained.

"Where were you?"

"I don't know. It was dark . . . narrow street . . . I don't know."

"Well, just relax. Don't worry about it too much. It'll come back to you." The doctor stood up, then reached over, taking a magazine from Neir's night table. He held it out to the new patient. "What's the name of this book?"

"*Menosian Illustrated Weekly*," was the reply. "Why?"

The doctor nodded. "Nothing," he said easily. "You can read it later if you wish." He dropped the magazine and went back to his chair.

The examination went on. The doc-

tor asked questions, sometimes referring to the form before him, sometimes following up the little paths opened by the comments he got. The nurse wrote, turned pages, and wrote more. Finally, the doctor stood up.

"Well," he said, "go ahead and read your magazine. Just take it easy for a while. You'll be all right." He went out of the ward, followed by the nurse.

As they went out, Neir laid his magazine down.

"You mean you can't remember anything?" he queried incredulously.

"I can remember some things," was the reply, "but I can't remember me." He grimaced angrily. "Wish I could move this arm."

"Aw, don't do any worrying about it." Neir waved his magazine. "The doc said it'd clear up." He grinned. "We'll have to call you something, besides 'Hey, you,' though. How about Varon?"

"Makes no difference, I guess," was the answer. "It's a name."

In the ward office, Dr. Pyrden looked at the nurse. "We'll just have to put him down as a 'Harl Varon,' I guess. Birthplace unknown, occupation unknown, status unknown. Write him up for occupational therapy, starting tomorrow." He sighed, looking at the neat files. "He'll have to learn a trade, of course, and they'll have to hunt up a sponsor for him. I doubt if he'll ever remember, but maybe we can get that arm to working again. He'll stand a better chance of a good sponsorship if we do."

Kiea Thendor was checking over her notes. "I wonder if we'll ever find out who he is." She tapped her pen against the paper, then looked up. "I can't understand this part, doctor. He said, 'must have sneaked up without thinking.' What does thinking have to do with it? What could he have meant by that?"

Pyrden stirred uneasily. "I don't quite understand it either," he admitted. "There were a few other peculiar remarks, too." He started to rub his jaw, then jerked the hand away. "Under some circumstances, I'd suspect him of faking, but I can't see any reason for it here. The way this man was dressed, he must have been well off—an independent citizen. If there were any criminal actions involved, the protectors have his description." He shook his head. "No," he decided. "He'd have nothing to gain." He reached for the communicator keyboard.

"As it is now," he added, "the protectors may find someone that knows him. With his memory gone, he'll never be able to re-establish himself, so we'll have to find a sponsor for him."

Kiea's head drooped a little. "Seems like a terrible thing, to lose his rights like that."

"Yes, too bad." Pyrden was punching keys. "Well educated, too, I

think." He shrugged. "Well, I'll give Protection the information we have. No use bothering the Sponsor Service until we find out what we can do for that paralysis."

Somewhere in the Missing Persons division, clerks checked cards. Descriptions were compared, and new complaints checked. Eventually, the case was returned. A man had been found, but he hadn't been missed.

The file of sponsored workers was examined. Some were missing, to be sure, but there were always those, and none resembled the subject. Again, the case was returned.

A bored protector checked out the clothing labels, but sales clerks see so many people during a day, and none of this stuff was new. He tried a few public places—the library, the museum, a few clubs and restaurants, some hotels. He found vague remembrances of someone looking like that, but no identification. Obviously, the subject had been in the city for some time, but he was of no prominence. Finally, an official glanced over the file.

"Might be a foreigner," he mused, "but we have no inquiries." He leaned back, looking at the protector. "The hospital people are sure his memory's genuinely gone?"

"Definitely, sir. They say that there's no chance of any recovery. With the type of injury he had, they're surprised he lived through the first night."

The official smiled. "In that case, even if he were a foreign agent, he'd be of no further use to his homeland, and we might as well get some work out of him." He closed the folder and beckoned to a clerk. "Here," he ordered, "endorse this over to the Sponsor Service division. No reason for us to waste further time with it."

The file continued on its way to a cabinet, and its subject followed the routine of hospital rehabilitation. Harl Varon was a real person.

He walked into the occupational therapy office, and the therapist looked up as he approached her desk.

"Right on time, I see," she smiled at him, then glanced down at the card in her hand. "I just got this. The Dornath Establishment has decided to sponsor you." She looked happily at him. "That's good luck, isn't it?"

"Dornath?"

"Why, yes. They make the Dornath turbo-car, you know. It's one of the biggest factories. You're very lucky, but then, you've come along beautifully with your training." She stood up. "Well, we'd better get to work. You'll be an assembler, so we should concentrate on manual dexterity."

Varon followed her to the tables. The slight drag of his left foot bothered him a little, but not too much. He flexed the fingers of his left hand. There was hardly any numbness left. He flexed his arm, then raised it. It came up, shoulder high, then stopped.

He concentrated, but it would go no higher. The therapist turned.

"Don't worry about that," she advised. "It'll clear up in time. Besides, in your work, you won't need to raise your arms. It's all bench work, with the materials in easy reach, just like this table." She pointed to the trays of machine parts which were arranged in two quarter circles. Directly in front of the chair was a diagram, showing an assembly. Varon saw that it looked like the pump described in the little pamphlet he'd found on his table the previous night.

He sat down, examining the trays before him, as the girl explained the steps necessary in the operation he was to practice, then he started putting the parts together.

It really wasn't a difficult assembly. In a few days, Varon discovered that he could set it up in less than the required time. The therapist checked him one morning, nodding her head in satisfaction.

"Why, you'll make a very successful assembler, Harl," she complimented. "I can give you a certificate of completion right now." She wrote on a form and handed it to him.

"Here. Take this to the office. They'll make out your discharge and give you the necessary papers and details."

At the hospital office, Varon encountered very little difficulty. He had to wait, of course, for various clerks and officials, but it was still early afternoon when he found himself at the Dornath Establishment. In due time, the receptionist nodded at him, and he went into the Personnel Director's office. As he walked in, he looked about. It was a neat office. There were some pictures on the wall, a portrait, and a couple of group pictures. A pair of certificates were prominently displayed, and there was a neat arrangement of chairs, and a man behind a desk. The metal sign identified him as Kort Dandro, Director of Personnel. Just now, he was occupied with some notes in a folder. He examined these carefully, finally making a notation on one, and shoving the folder aside. He replaced his pen in its stand, then looked up questioningly.

"I'm Harl Varon, sir. I was told to come here from the City Hospital."

The official frowned for an instant, then smiled. "Oh, yes. You're quite prompt." He turned. "Cara," he called. "Bring the folder on the new man, Harl Varon."

There was the sound of a file drawer opening and closing, then a girl came in, carrying a folder. She spread it out before her superior, picked up the folder he had been examining, and went out. The executive bent over the new folder for a few moments, turning the sheets. At last, he looked up.

"Well, Varon," he remarked, "you're in pretty good shape." He tapped the file approvingly. "I should say the budget department did very

well for you. Very well, indeed."

"Of course," he added, "you had a pretty heavy commitment when we agreed to sponsor you. Yes, you were a pretty sick man, and you'd been in the hospital for some time. We had to consider quite a few aspects in your case. But then, I think you'll make good. Certainly, we all hope so." He smiled encouragingly at Varon, then bent to the folder again.

"Your hospital charges amounted to some eleven hundred ninety-two crowns, sixty-three kel. That, of course, has been paid over to the City Hospital. We can't have our workers in debt, you know. We opened an account for you in the Employees' Welfare Fund, and they've agreed to amortize your account at four crowns per week, with interest at a tenth of one per cent per week." He turned the folder so that it faced the new employee, pointing at the figures with his pen. "Your initial wage will be twenty-eight crowns per week, and your basic food bill at the Workers' Cafeteria will run to ten. You are unattached, I believe?"

Varon grinned. "I guess so," he admitted. "No one seems to—"

"Exactly." The counselor smiled back. "So, you can be quartered in the single men's dormitory. The charge for that is eight crowns a week. Now, let me see." He ran the pen down the column of figures. "Four and ten, plus eight. That makes twenty-two, which leaves you an allowance of six crowns a week for spending money. You should be very comfortable." He stood up.

"Suppose we go on down to the department, and I'll introduce you to your supervisor."

They went out a side door into the park. The high, pale brown buildings inclosed a large quadrangle, which was landscaped into a miniature woodland area. A path led between hedgerows, wound over a small bridge, and disappeared as it curved into the trees. Overhead, the sky made a pale blue roof, dotted with a few clouds. Varon looked at the view with some pleasure. Here, he felt, was a place where a man could relax in the evening. As they crossed the bridge, his guide made a sound of annoyance. A man had just come into sight around the bend in the path.

"Cenro," called the official, "stop. I want to talk to you."

The man had started to go into a side path, but stopped, then stood, waiting.

"Cenro," said the counselor, "what are you doing here?"

The man shuffled his feet a little, then moved the case he was carrying under his arm into plainer sight. "I have to take some stuff up to Executive Branch, sir. I wanted to save time instead of going all the way around."

The executive looked at him sorrowfully. "I can't understand it," he

murmured. "You know the rules, Cenro. Why do you persist in breaking them?"

"I just wanted to save some time."

Kort Dandro shook his head. "Well, we won't waste any more, then," he decided. "I'll speak to your supervisor later."

"Yes, sir." The man turned into the side path.

Dandro watched him disappear. "That man," he complained. "An excellent worker most of the time, but he will persist in getting into trouble."

"What did he do?" Varon was curious.

The counselor looked at him in some surprise. "Why, he was here, unescorted," he started, then hesitated. "Oh," he added, "I forgot. You haven't been informed yet, of course." He made an inclusive gesture. "This is Executive Park," he exclaimed. "Workers are never allowed here, unless escorted by a member of the Executive Branch. We can't have our employees wandering about in here, neglecting their work. Why, it would upset the whole plant routine." He looked around the park approvingly for a moment. "Besides," he added, "the average worker is rather thoughtless. Crowds of them would ruin the landscaping."

"Oh," said Varon, "I see. But what will happen to the man?"

Dandro seemed annoyed. "Why, really!" He checked himself. "Why, really, I don't know. I suppose his supervisor will think of something." He suppressed his annoyance and smiled engagingly. "We of the Personnel Service don't involve ourselves with disciplinary problems, you know. We are here to help the worker, not to punish him." He paused, eying Varon.

"The Establishment rules, you will find, are all in the 'Employees' Informant.' Your supervisor will give you a copy, of course." He sighed. "I hope you, at least, will observe them."

He led the way through the park, finally pausing before a door marked "Small Pumps Department." He directed a pointed glance at Varon, who took the hint and opened the door for him. Dandro proceeded through, followed by the newest assembly hand.

At the end of the long room, where the conveyer tracks converged to go into the next department, there was a small, glass-walled office. As they entered, the man at the desk looked up, then got to his feet.

"Piros, this is your new man, Harl Varon." Kort Dandro gestured. "Kolar Piros is the general supervisor of Small Pumps. He'll explain your work to you, Varon." The counsellor turned. "While I'm here, Piros, I think I'd like a look at your department."

"Certainly." The supervisor opened a drawer and picked out a booklet. "Here," he said to Harl, "read this for a while. I'll be right back." He followed Dandro out the door.

For a moment, Varon watched them as they went along the aisle between the benches, then he looked at the booklet. It was titled, "Employees' Informant." He opened it, discovering that the first page was a fold-out map, with the various locations within the factory indicated. Later pages described certain sections, such as the Workers' Cafeteria, the Quarters, the Sales Store, and so on. Following that was a list of rules. Varon flipped the pages for a moment, then looked out of the window. It was, he had noticed, the only window in the department. Out in the assembly room, the walls were decorated with framed signs. "Precision First" "Efficiency Leads to Contentment" "Your Production Quota is—" At the end of the room, a large heraldic design indicated that this was a part of the House of Dornath.

Outside the window, Varon could see a part of the testing lot. As he watched, a turbo-car came down the track, the whine of its blower sounding faintly through the wall. It came to a turn, slid half across the track, then emitted a puff of black smoke, straightened, and accelerated rapidly. The scream of tires died away, the blower whine faded, and Varon returned to the booklet. He was reading when Piros returned.

The foreman was alone. He glanced at the new man, then crossed the room and sat down behind his desk.

"Think you've read it pretty thoroughly?" Piros asked.

"I think so, sir."

"You know about Executive Park and the other restricted areas?"

"I think I understand."

The foreman nodded. "Good. And, I suppose you'll be able to find the Quarters?"

Varon indicated the map in the booklet. "I believe I can, sir."

"That's fine." The foreman glanced at his watch. "It's almost shift time now, so I think I'll show you your work place, then you can go over and take it easy till your shift comes on." He started for the door, and Varon followed him down the aisle. They stopped by an assembly bench.

"This," Piros informed his new man, "is your place. Number twelve." He pointed to a large number painted on the side of the bench. "You'll come on at zero hours, punctually, of course, and start work immediately. Don't worry about checking in. Your group leader will take care of that, and he'll give you any advice you may need. His name is Mawner." He paused, looking at Varon.

"I won't see you again for some time, unless you violate some regulation, so go ahead over to the quarters, get settled, and remember, do good work, and Dornath'll take good care of you." He nodded a dismissal, and turned away.

For a few heartbeats, Varon watched him as he strode down the aisle, then he walked to the door. Out-

side, he checked the map in his "Informant," looked at the building numbers, and started toward the workers' quarters. It was a fairly long walk. Varon looked about as he went, occasionally checking his location with the map. He entered a building marked "Men's Dormitory." A directory told him the location of his room, and he climbed the stairs, then went down the corridor until he found a door numbered 304.

Varon opened the door, then paused, looking at the room. A man was getting something out of a wardrobe. He noticed the newcomer and turned, facing him.

"You the new man?"

"Yes. Just came in today."

"I see." The man pointed. "That's your spot, over there. You better go down to the office, though, and get your gear." He looked down at the roll of cloth in his hands. "Play *tungo?*"

Varon smiled. "Afraid my education didn't go that far," he admitted.

The man stared in surprise. "Where you been?"

"Just got out of the hospital. Head injury."

"Oh." The man closed the wardrobe door. "Well, make yourself at home. I'm going to see if I can scare me up a game." He went out.

Varon crossed over to his bed and sat down, looking around the room. There wasn't much to see. There were the four wardrobes, the beds, a couple of mirrors. There was the writing table. On the walls were a few pictures, neatly framed, and a couple of certificates—also neatly framed. The floor was bare and scrubbed. The window looked out on an airshaft. He got up again and went to the door. A framed notice was bolted to the inside, large letters identifying it as, "Dormitory Regulations." He read it through, then went out into the corridor, glanced toward the recreation room, and started toward the stairs.

Some time later, he returned. He dropped the load of gear on the bed, then stood, looking at it. His account at Employees' Welfare had grown. He stretched cramped muscles for a moment, then glanced over at the framed regulations. Article two, he remembered, stated that rooms would be kept clean and in neat condition at all times. He looked back at the pile of clothing and equipment on the bed. It wasn't neat.

Finally, he looked with satisfaction at the well-made bed and the closed wardrobe. There was a reason, he realized, why occupational therapy had included such things as bed making and orderly arrangement of working clothes. He looked about the room for a few minutes, then went out into the corridor and through the arch into the recreation room.

Most of the off-shift men were there. Some of them were reading. A few were writing at the small tables,

but the crowd was around a table at the center of the room, where a large playing cloth was spread. There were a number of counters scattered about the enameled pattern, and everyone was watching a man who shook a leather cup. He plunked the cup down on the table, then up-ended it to let four tetrahedrons fall out. He studied them slowly, then examined the playing board.

He looked thoughtfully back at the tetrahedrons, finally picking up two of them and replacing them in the cup. A man in the group of watchers shook his head.

"Long shot," he grunted. "He'll never make it."

Another man took some coins from his pocket. "Garn's lucky," he declared. "How much you bet?"

"Half a crown says he can't do it."

"Put up your money, Mern. You got a bet."

The cup smacked down on the table again, and the *toren* fell out. The player glanced at them, then started moving counters around the board. "Tungo!" he grinned.

Mern watched the successful better pick up the two coins. "Oh, well," he remarked defensively, "it was a good bet, anyway."

Varon watched the game for a while. It seemed to be simple enough. The counters were moved according to the figures thrown from the *toren* cup. Certain positions of counters and corresponding figures on the four *toren* permitted the player to make extra moves and to take a second throw. Such combinations were known by the term "*tungo*," after which the game seemed to be named. The game seemed relatively uncomplicated, but there was an element of skill, especially in selecting odds. A player could make a second attempt at a *tungo*, but lost his turn if he failed to make it. Eventually, Varon lost interest, and wandered down town.

He returned late in the evening. The City Library, he had found, provided a better collection of books than the hospital had afforded, but he was mildly annoyed at the restrictions. The cards of two of the books he had chosen had been code-numbered in blue. The clerk had been quite irritable about it. He should have known that common workers were not allowed to take any book with a colored-code number. His stupidity had caused her extra work, since now she would have to refile the card needlessly. He had taken a black-coded book, but the footnote references to the books he had wanted still bothered him.

A *tungo* game was still going on in the recreation room. Other players had replaced the men who had been at the board when he left, but the watchers still stood, making occasional bets. He joined the crowd.

A man came in, dropped into a chair, and sat glowering angrily at the game. Someone noticed him.

"Hey, Cenro, what happened to

you? Mad at the world?"

"Caught extra work."

"How come?"

"Ah, old Dandro again. Piros sent me over to Executive with a bunch of reports and Dandro was hauling some nid through Executive Park. He saw me." Cenro flopped a hand angrily on the chair arm. "Another half year's raise privilege gone." He shook his head, then looked around the room and noticed Varon.

"Oh, you! Why couldn't you have kept him busy talking? Maybe he wouldn't have noticed me." He stood up again. "Absent-minded old dope can't see anyone when he's putting out some of his 'good advice.'"

"But, I didn't even know you weren't supposed to be there." Varon was surprised at the sudden denunciation. "I'm sorry—"

"Agh, nids never know anything." Cenro looked at him scornfully, then turned away. "Heck with 'em. I'm going to bed." He stalked out.

Varon looked after him. Behind, a man yawned noisily.

"Yeah, guess I'll crawl in, too. Another day tomorrow."

As Varon looked back toward the *tungo* game, some of the onlookers glanced quickly away from him and became absorbed in the fall of the *toren*. He looked down the hall, noticing that men were coming out of their rooms, dressed in work clothing. Sleepily, they started for the stairs. With a start, he realized that this was his shift. There would be no sleep for him. In fact, he would have to hurry to avoid being late.

Somehow, the shift passed and he staggered to his room, slept, and went to work again. As the days passed, and grew into weeks, Varon gradually became acquainted with his fellow workers, but there was something still lacking. He had tried playing *tungo*, but it hadn't worked out. At first the game was expensive, then profitable, then boring. When the time came that his combinations worked out exactly as he wished, he was pleased, but the pleasure quickly turned to embarrassment. He stopped playing *tungo*, and turned his attention to other activities, but there was a constraint. As his paralysis faded and disappeared, he joined in some of the informal sports, but again, he was not fully interested. Too, he noted a certain resentment and antagonism underlying the sports. The losers smiled and congratulated the winners, and the winners praised the losers for their skill, but it was not wholly convincing.

And then, there was the little clique, headed by Cenro, who seemed to take delight in pranks at the expense of the "nid." More and more, he found himself drifting down town to the library.

He dropped the small coin into the turnstile, walked into the lobby, and turned, disregarding the elevators—they were for independent citizens, anyway. He walked up the long stairs

to the catalogue room. At first, through force of habit, he started toward the historical section, but then he changed his mind. Instead, he decided, he'd try something else. He turned the huge leaves of the catalogue, scanning the title slots. Finally, he came to an interesting looking title. He pulled the card out, examining it. Under the title, "Other Worlds in Space," was a short description of the book. It was listed as a fanciful account of the possibilities of life in the rest of the universe. The reading fee was twenty kel. He carried the card over to an attendant's desk and laid it on the counter.

The girl finished her comments to the other attendants, then crossed slowly over to him. She glanced disparagingly at the worker's clothing, then picked up the card. Again, she looked at the man before her, wondering what a common workman would want with a book like that. Well, it was in the open stacks, she realized, so there was no reason for refusing it. She tapped out the code number for the book, dropped the card into the suspense box, and went back to her conversation.

". . . So, I says to him, 'Listen, you, if you think I'll go out with just some common assembly hand—me, a clerical—you're crazy.' The nerve of the guy!"

There was a murmur of assent, then a smallish man, dressed in the tight-fitting costume of the professional entertainer class walked up to the counter. The girls stepped on each other to take care of him. Back of the counter, a low hiss and a thump indicated the arrival of a group of books from the stacks. No one paid any attention.

At last, the entertainer got his book. The girls drifted to other parts of the counter to take care of the waiting patrons, and one of them went over to the conveyer. Quickly, she glanced at the tags on the books, then brought them to the counter. One, she laid before Varon.

"Twenty kel," she told him.

Harl shoved the coins forward on the counter. She looked at them, then dropped them into the slot, stamped the book card, and put it into the "in use" file. Varon walked upstairs to the reading room, showed the book to the girl at the gate, and chose a table.

The book was a flight of fancy on the part of a prominent astronomer. He outlined the known facts about some of the major stars, went into the possibilities of interstellar travel, described his own conception of a spaceship and its controls, and went into detail on the possibilities of life under conditions other than those familiar to his readers. Varon found himself amusedly criticizing some of these possibilities. Of course, no race had ever developed without first using tools. That was a basic necessity. In their beginnings, all of the advanced

races had been physically equipped to design and use some form of tool, but there were many of the elder races who had evolved—

Suddenly, he realized what he was thinking.

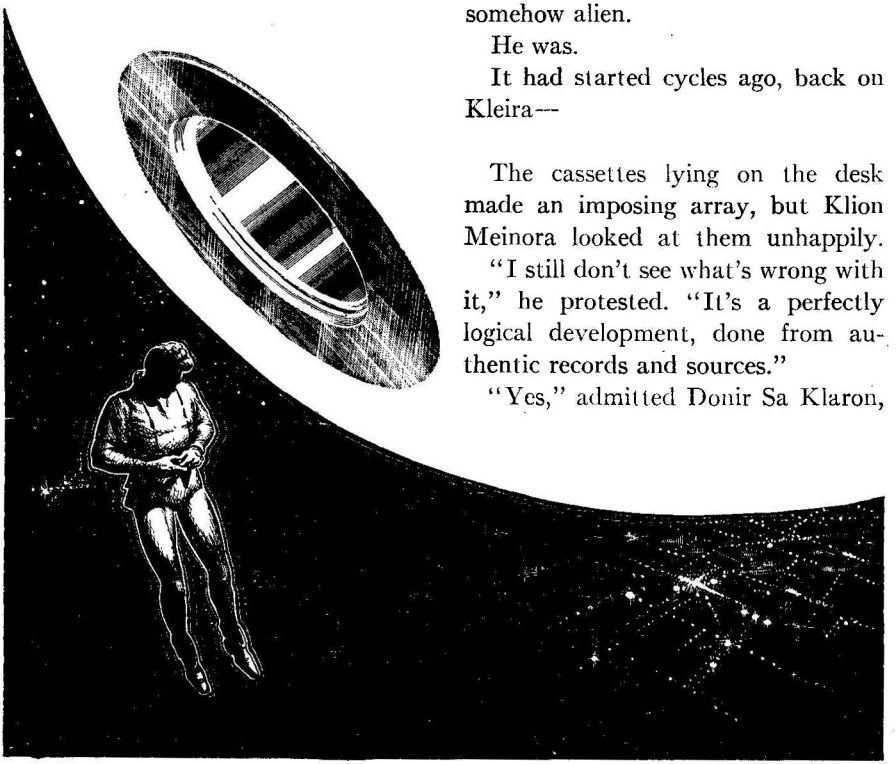
He raised his head, looking at the reading room from a different viewpoint. Then, he looked down at the book in his hands. An obstruction finally shattered, and his memory returned like a stream flooding over the remains of a dam. He knew who he was. He knew where he came from. He remembered why he came, and how, and he could piece together that scene in Empress Miralu Street. Also, he recognized with a sickening sense of loss his intimate concern with that mysterious destruction of a village in Timlar, which had filled the news for several days. And he recognized his personal interest in the explosion and fire in Klewor Street.

And he'd thought his troubles back in the hospital were bad.

And he'd resented the unspoken attitude of his fellows at the Establishment, who seemed to feel that he was somehow alien.

He was.

It had started cycles ago, back on Kleira—



The cassettes lying on the desk made an imposing array, but Klion Meinora looked at them unhappily.

"I still don't see what's wrong with it," he protested. "It's a perfectly logical development, done from authentic records and sources."

"Yes," admitted Donir Sa Klaron,

"it's logical, but is logic the only requirement in an Archaeological Synthesis?"

Meinora squirmed. "No," he said reluctantly, "it can only be applied to short sequences." He looked back at the cassettes. "Then, variation must be taken into account, and new points of reference must be established, after which a further logical sequence may be deduced."

Klaron nodded, then waited.

For a while, Meinora looked at him expectantly, then, "But I did use reference points," he defended himself.

"From personal observation?"

"Well, no. No, I didn't actually go out and set up my automatic observers too many times. I got most of my material from Exploratory Corps reports and from records and reconstructions in the Celstorian Collection. That's legitimate, isn't it?"

"Of course," agreed the older man. "Of course it's legitimate, and a good many students make up their theses that way, but I'd expected something more from you." He leaned back for a moment, looking at his student. "You're young, Klion. As an individual, you have lived but a short time, but your race is old. I have students from the younger races, too. Some of them are older than yourself, but they are also younger. From them, I expect certain things. So much, and no more." He sighed. "Education is peculiar here on Kleira, my son. There are no gradations of achievement, you know. One doesn't follow a prescribed course. He continues to study until he has gotten all he can. A few drop out, deciding they cannot understand. Sometimes, they return later, and finish." Klaron looked out of the window at the wide vista of the planet. Then, he leaned forward.

"What is the real purpose of Archaeological Synthesis, Klion?"

"Why, it's the study and analysis of primitive trends, coupled with known development, for the purpose of establishing rules and laws of historical sequence."

"Very good. But what follows?"

Again, Klion moved uncomfortably. "Well," he continued, "trends must be positively authenticated and traced. Derivatives and reconstructions should be kept to a minimum. Do you mean that my conclusions were colored by preconceived ideas?"

"Well, there is always that possibility, but that wasn't exactly what I was thinking of. I could accept this, but I think you could do better. You give hints of a serious objective here. What is it?"

"I think that the social and ethical factors have been neglected in consideration of the transition from the Mechanical-Industrial era to the age of Empathy. The mechanics of the transition have been explored, but there is still something missing, and I think I can add something in the area of ethics. I used Kleira as a reference frame, since I've studied here for some

time, and there is quite a lot of authentic material on the last war of destruction."

"And your reference points for extrapolation?"

"Well, there were Polymar's observations. I took some data from Exploratory Corps reports in Sector Seven. There was some excellent synthesis in the Celstorian Archives, and . . . well, I did some inductive reasoning myself. I took several derivatives and built up the path of greatest probability."

Klaron leaned back, spreading his hands on the desk. "Neither Polymar's observations nor the Corps' surveys were taken from exactly your point of view, were they?"

Meinora shook his head. "No," he stated decisively. "No, they were not. I had to—" He broke off, then leaned forward. "I see what you're driving at," he decided. "I should go out, set up my own observations on planets specifically picked by myself from survey. I should be my own source, then come in and make my reconstruction."

Klaron nodded slightly, then waited.

"But, I can't go out for cycle after cycle, living like a Spacer, seeing no one, making no social contacts."

"The Free Citizens seem to like that sort of life."

"But they're different. They must like solitude. They repair their own equipment—even build a lot of it themselves. I don't believe they need credits. Certainly, they never seem to have any."

"Space is big, and far from empty," commented Klaron. "Everything necessary for life is out there, if you have a ship and a matter converter."

"True enough." Klion thought for a moment. "I could work as well out there as on a planet, but I'd still want companionship, and some occasional diversion."

"Well, you could try getting acquainted with the Free Citizens. You'll find they have a lot to offer."

"The Spacers?" Klion stared at his teacher. "But they seem to be such an unsocial lot. Sort of . . . oh, I don't know . . . uncultured, I guess."

Klaron smiled gently. "Go on out there and see," he advised. "That's where you will find a good many members of the elder races."

Meinora looked at him incredulously. The teacher nodded gravely.

"A good many," he repeated. "And, if you get bored, or need credits, you can always try writing entertainment." He touched one of the cassettes. "Your work has literary merit. Why not rework some of these sequences into stories?"

For a time, Meinora looked at the Archaeologist, then he started putting his tape cassettes back in their cases.

"I could do it, of course," he agreed. He closed the case and turned, looking out at the horizon. "I'll try it," he decided. "Thanks for the advice."

"It's quite all right." Klaron touched a button on his desk, and a portion of the wall slid aside. "If you wish, you can bring your observations in when they're completed. I'll go over them with you."

"Thanks again." Klion Meinora stepped out on the balcony, stood looking over the landscape far below, then touched his levitator control and stepped over the edge. He dropped a bit, then rose into the sky.

For a few standard galactic cycles, his little ship darted busily over the galaxy. He gathered data—evaluated—synthesized. Then, he started rechecking, and another period of data-gathering commenced.

He whistled contentedly as he checked a series of tapes. They were very satisfactory. Some extrapolation would be necessary, of course, and a little derivative work would be required, but this last observer group had cleared up a lot of the rough spots. Three distinct paths of development were now plainly indicated, and variants from them would be almost certain to give a valid reconstruction. He had a couple of observer groups planeted, and one more check should complete his field work. Then, a little correlation would give him something he could take back. He felt certain that Klaron would be pleased with his results this time.

He glanced over at the control console. The tiny pilot light was beginning to glow red. As he rose and crossed the room, a buzzer warned that the ship was coming out of trans-light at destination. He sat down, setting up the viewscreens to look at the system he had planned to use as the site of his last observation before returning to Kleira.

But it was the wrong system. He looked at the screen incredulously. Where a G3 sun should be, was a small F1. Instead of the expected nine planets, there were five. Obviously, something had gone wrong. He pulled the tape out of the course tracer, examining it, then he got out the Star Catalogue, and started comparison check. Ships didn't just drift off course without a reason, and he knew that there would have been plenty of warnings in case of circuit failure. Step by step, he started rechecking his computations.

It was a simple mistake. Anyone could have made the transposition, but that didn't minimize the thing. In the fourth step, it was just an error of three units in the third and fourth significants, but in the fifth step, it was bigger. In the final course settings —Klion growled to himself in annoyance as he checked the probable coordinates, set them up on the index keyboard, and punched the Catalogue activator.

The viewer was blank. Of course, there was a background of stars, but center was empty. The tabular explained matters.

Out toward the periphery, Galactic Sector Twelve had not been completely explored. It was a comparatively new sector, partially occupied by the Mirandoan Empire, which controlled a small star cluster and declined to treat with the Federation. Since the Mirandoans were merely anxious to maintain their own independence, were not inclined toward conquest of Federation planets, and had offered no violence to Federation citizens, established policy forbade any interference with them, and the outer periphery behind the Empire had yet to be visited by Federation explorers. The whole area of space was simply dismissed by the Catalogue as "Not Checked."

Meinora swung to the control console again, and set the ship into a slow roll, bringing various stars to center screen. The spectrum analyzer picked up the faint light from each in turn, and the computer hummed softly as it accepted the offered information. Finally, the pilot walked over to the computer, touched the "Conclusions" switch, and watched the tape come out. It was identical with the probable position computation. He punched the necessary keys and discovered that the boundaries of the Mirandoans did not include his position. He was in free, unexplored space, where no star had been noted, where no exploration cruiser had ever come. And there was a star. A little star, of course, with only five planets, but a star.

As a Federation Citizen, he knew he should report the characteristics of the system and allow the Exploratory Corps to make the first contacts. Of course, there was no iron-bound law, but it was customary. He could, of course, ascertain the level of civilization, if any, and he could also request and secure priority on observer rights if his research would be furthered by observation of the newly discovered system, but he should not contact the civilization in any way, nor should the planet observers until the Corps had made their preliminary survey.

He looked at the small system. His approach had been such that the nose of his ship was nearly at right angles to the ecliptic, and the small star with its satellites looked like a text illustration in the viewscreen. The selective magnification, which brought the planets to perceptible size, heightened the illusion. He increased the magnification, examining each of the planets in turn. Two of them presented the slightly woolly appearance which indicated atmosphere. The outlines of the others were hard and sharp. He fanned out his detectors to maximum sensitivity, but was unable to discover any trace of space travel. Finally, he approached the third planet from the sun, nosed into the atmosphere, and took checks. He quickly reversed course, and dashed out into space again. Nothing human could live in that stuff. Possibly a K'mardin ob-

server might find something of interest, but he wanted no part of it.

He approached the fourth planet. Its atmosphere tested satisfactorily, and he approached the surface, detectors and viewscreens set at high resolution. The planet resembled Kleira amazingly. It had the same general configuration—three major land masses, cut up into sub-continents by the seas. He approached one of the major continents, checking for signs of civilization, then he bent closer to his viewplate.

This planet was just what he had dreamed of. The development stage was perfect. They were well along in the mechanical age, but there was obvious evidence that the social structure was lagging. Each of the cities was divided between luxury and squalor. There was positive evidence of archaic structure still in use. Even in the modern parts of the cities, some of the buildings were well designed, clean, beautiful, while others were more like shacks. Still others had once been clean, even luxurious, but were now run down, dirty, and ramshackle. An exclamation of pleasure escaped the observer. This was the way he had pictured Kleira in the days just before the War of Destruction. Here was the perfect reference point. Even the inhabitants were so nearly identical with those of Kleira as to be completely indistinguishable.

He reached to the communicator to call Sector Twelve, then slowly pulled his hand back as he remembered.

This was an undiscovered planet. There were no data available. The Exploratory Officer wouldn't simply grant routine permission to planet observers. He would set up his own patrol and make observations first. For two or three cycles, the Corps wouldn't want any outside observers stumbling about underfoot. It might even take longer than that. Of course, they would give him their observational results, but Meinora had definite ideas by now as to what he wanted, and the Corps didn't make that kind of observation.

They were interested in physical trends, in topography, climate, things biological. They did take ethnic and social notes, but these were side issues. They were very seldom concerned with the details, for instance, of a political coup, of an industrial conflict, or of the historical and ethical researches of the native scholars. They had little interest in the day-to-day life of the average native. But these were the things Meinora needed. He could see himself with not one, but several reference points. He sat back, watching the viewplate as it reflected the activities of a city.

If he could only make planetfall!

But direct contact was against custom. He was already at the limit of prudence.

He hadn't attracted attention yet, but if his ship continued to hover—

He would have to call Sector Head-

quarters. This was their job.

All that beautiful data down there, and cycles to wait.

Just one cycle, and he'd have his information.

The system was undiscovered—isolated. It would be unnoticed for a long time. Personal reconnaissance would never be detected by the natives, or noted by the Guard.

The rules of contact were devised to prevent interference with planetary development. Observation wouldn't interfere in the least.

An observer doesn't meddle with a culture. He simply watches it and takes notes.

He could get all the information he needed in a cycle, then correlate his notes while exploration was going on.

It wasn't as though he contemplated harmful action. He would leave this planet as he found it, and report it, of course.

The ship dropped rapidly through the atmosphere on the night side of the planet. A thousand feet above ground, it leveled off and Klion Meinora dropped out of the port, levitator on to allow him to settle to the ground. He turned his mental force amplifier up to detect the presence of any native, switched in the body shield modulation which rendered him invisible, and floated toward the city, confident that nothing could go wrong.

But something had gone decidedly wrong. He was still here.

He looked at the book, considering it. If one remembered the amount of data available to the writer, it was well done. In fact, it was good. He laid it aside and cupped his chin in his hands, exploring the extent of mental damage he had suffered. It wasn't too serious. There had been some tearing of tissue, he knew, but it had healed and regenerated to a great extent. A primitive, he realized, would have been permanently crippled, but the long periods of existence had brought changes to Meinora's race. He traced out the mental lines, re-establishing a few interrupted paths. Finally, he realized he had done all he could. Time would take care of the rest. His efforts had produced a slight headache, so he closed his eyes and lowered his head to his arms to deal with it. Also, he sent out a questing thought. There was no result, but he hadn't really expected one. Those news stories had been too obvious.

After a few minutes, he raised his head again, feeling almost normal. He picked up his book and made his way to the door. At the gate, the girl looked sharply at him, but said nothing. He put the book on her desk.

"Good book," he told her. "Read it some time." He went out.

The girl sniffed, looking after him indignantly, then she picked up the book, looked at it curiously, and defied library rules. She commenced to read. Meinora walked out of the library, looked about, then took the

road toward the Dornath Establishment.

As he walked, he idly wondered what the native reactions would be when the camouflage cells wore out in those unclaimed automatic observers which circled two planets. He grinned to himself. The things would be visible eventually. They would evade any attempt at pursuit, and eventually they would cease to record and start following random courses. They could be expected to bunch up, too. He wondered what theories would be devised to explain their presence.

Back at the dormitory, he glanced into his room, then went back to the recreation room. Everyone was gone, and he looked about uncertainly until he remembered. The off-shift people would be at the fights, of course. Garn hadn't bothered to put his *tungo* set away. Idly, Varon went over to the table, picked up the cup, shook, and spilled the four tetrahedrons out. They fell into a neat row, their pips showing one, two, three, and four. He picked up the end *tora*, flipped it into the air, caught it in the cup, and rolled it out on the table. It rolled to the end of the line, showing four again. He scooped the *toren* up, replaced them in the cup, threw them again. They showed all threes this time. For a few minutes more, he toyed with the cup and *toren*, then he shook his head.

"Ethics," he reminded himself. "Remember?"

He walked back to his room. A quick search of his wardrobe produced no writing materials. Of course. There was no one to write to. He had never bought any, but now he could see a need for large quantities of paper, considerable ink, and a good pen. He set to figuring his accounts without paper.

When he had come to the factory, he had been loaned some eleven hundred crowns. Oh, yes, eleven hundred ninety-two—and sixty-three kel. The clothing, bedding, and other equipment he had bought the first day had cost one hundred twenty crowns. The interest rate was one tenth per cent a week. He rubbed his chin. He had been here some twenty weeks, during which time, he had paid in eighty crowns to his account. He searched his memory for the various charges due to purchases at the sales store and snack bar. Slowly, they were recalled and added to the interest. Finally, he sat on his bed, shaking his head with rueful amusement. His respect for the Dornath budget department was mounting. As closely as he could figure, his present debit balance in the Employees' Welfare Fund was thirteen hundred twenty-two crowns, ninety-seven kel. He wondered how deep they would let him get without a caution about excessive spending. He fished into his pockets, bringing out three crowns and a small handful of change. Walking over to his wardrobe, he unlocked the private drawer. There were six four-crown notes. Here, then,

was proof that he had managed to save something at least.

"Fooled them a little," he laughed. "Let's see. At this rate, it won't take me much more than a thousand weeks to pay up in cash. Then, I'll have enough to put up a 'Bond of Independence' in another eight hundred, and I can go out and do as I please." He leaned back on his bed, laughing. "Why, that's only eighteen years. I'll be out of here in no time." He sobered again. "Of course," he told himself, "the average worker is only good for about fifteen of these two-cycle years, productively, at least, so they're still a few up."

He undressed and went to bed. If he remembered correctly, and if the laws and customs were administered as written, he would be leaving Dornath in much less than eighteen years. For a while, he reviewed some of his previous work in his mind, then he went to sleep.

Garn Verlera removed his *tungo* set from the wardrobe, and looked curiously at his roommate. Funny chap, that Varon. Never know what he'll do next. All this time he'd been here, he'd never used that writing table, then the other night, he'd come in with a package of paper, sat down as though he'd been doing it every night, and started writing. Garn looked at his playing cloth, then shook his head. It was probably just as well. No chance of his getting mixed up in a *tungo* game this way. He remembered Varon's uncanny displays of skill with the *toren* cup. As he walked down the corridor, he shook his head.

"Didn't remember a thing about the game when he first came here," he told himself, "then he learned how to play, and no one had a chance." He paused, looking back at the room. "Bet he was a professional gambler 'fore he got his head beat in. Funny guy!" He went on into the recreation room.

As he wrote, Harl Varon smiled to himself. It was going well, naturally. This story had already been written—far away, and by different means, to be sure, but he had done the entire romance before. It was merely a matter of putting it on paper instead of tape. Suddenly, he stopped, looking critically at a paragraph.

"Ugh!" He scrawled a huge X. "Language difficulty."

He tossed the page away and rewrote.

He was so absorbed in his writing that he didn't notice when Cenro looked in. With a grin, the man picked up the discarded sheet.

"What's all the writing about?" he inquired. Then, he started reading. Suddenly, he let out a whoop of derisive amusement and went dashing out into the hall. Varon rose from his chair.

That pest again! he thought. *Ethics be hanged!*

"Hey, you guys," shouted Cenro,

"this jerk thinks he's an author." He struck an exaggerated pose and started to read from the page.

"They looked out over the sea. Feathery clouds hung in the sky, tinted pale gold against the clear blue. The sun rested—"

Harl was at the door. He started to lash out with a furiously destructive thought, then modified it at the last instant.

"Dorn," he said mildly.

The man turned, the grin freezing.

"That isn't very polite, you know, Dorn." Harl's voice had changed timbre. It was plaintively reproving. "I'd like my paper back, please."

Cenro looked a little scared, like a boy caught in a prank. He shuffled back, handing the sheet to its owner. "I'm sorry, po . . . I'm sorry," he said apologetically. He went to his room, closing the door.

Varon went back to the writing table. He started to write, then he got up. He put his papers away, then crossed the hall, tapping at a door.

"Aw, go away. Don't—Oh, come on in, then." The voice was a little thick.

Klion Meinora closed the door, and stood looking at the room's occupant. Cenro sat on the edge of his bed, looking up defiantly. His eyes were a little puffy.

"I'm sorry, too, Cenro." Klion held out a hand. "I didn't realize until almost too late."

"Aw, you just caught me off guard," growled Cenro. He looked at the floor. "It was just like my old man. I used to kid around with his letters sometimes, till I realized he was too beat to raise a row." He drew a long breath. "You won't get me again."

"I don't want to. Look, want to get it off your mind?"

"Nothing you can do about it." Cenro started to get up. "There's nothing anyone can do about it."

"You can. Maybe I can help a little. Come on, let's have it."

A wave of sympathetic mental force pervaded the room. In his private thoughts, Meinora was fuming. If he only had his mentacom. This was work!

The story came out. It was slow at first, then it came in a furious flood of words. Dorn Cenro's father had been an independent clerk a good many years ago. He had come of a long line of independent artisans, clerks, minor bureaucrats. There had been a wife, children, a small house, even a car which Dorn had learned to drive. The Cenro family had their circle of friends. Young Dorn had been taught to look forward to a pleasant, uneventful, middle-class life. That had been before the disaster.

It had started with a clerical error. At first, a minor error, it had been magnified by the presence of dishonesty in the organization. Old Vark Cenro had been suspected. There was a trial—a long, expensive affair. There

had been appeals, and finally, investigation had exposed the defalcator, and incidentally vindicated Cenro, but expenses had been heavy, and income had ceased. The car had gone first. Then, the house had been sold. In time, it became necessary to use part of the Bond of Independence, and that had been fatal. Another court had found Cenro insolvent, and therefore unemployable. Eventually, a noble family had sponsored him, but living expenses had placed him in debt, and save though he might, the account was never cleared.

Dorn Cenro had left the free school, of course, and the House of Dornath had sponsored him in the common school. At first, his account in the Employees' Welfare Fund had been small, but it had grown until Cenro had realized he would never pay out. He would never accumulate that thousand crowns necessary to attain the status of an independent citizen. In fact, he would never be able to call his pay his own. There would always be that payment for Employees' Welfare.

Finally, Klion leaned back. "Quite a trap, isn't it?" he agreed softly. Then, he sat forward again.

"I see what you mean," he said, "you can't beat 'em. But you can join 'em." He pointed around the room. "Look," he commanded, "this is all you've got as a 'hand.' How about the foremen?"

Cenro shrugged. "Nicer quarters," he admitted. "One-man rooms, of course, and more allowance." He spread his hands. "Bigger account, too."

"So? Debts you've always got. They'll never let it get too big. Cenro, you're well above average in intelligence. You didn't get all your education, but they gave you common schooling. Why not grab all the advantages they'll give you?"

"Oh, I don't know. I might want a wife—kids. Who wants to raise kids to be sponsored workers?" Cenro frowned. Then, an idea struck him. "Look, Ha . . . Varon. You'll get out. You'll be big some day. You're . . . I don't know how you handled me, but you're too big for them. Look, how about you sponsoring me? I wouldn't want much, just food, clothes, a crown now and then. I just want to get away from here."

Klion was startled. He had come in here on an impulse. He had really wanted to help, but—He started to shake his head, then he came to a sudden decision.

"I'll make a bet with you, Cenro," he said. "You're right. I'll get out, and fairly soon, too. Then, I'll keep in touch with you. The day you are promoted to group leader, I'll pick up your account. Then, soon's you've worked with me for a while, I'll put up a bond for you. When you are ready, you can pay me back—without interest. Deal?"

Cenro jumped up. "Man," he cried,

"watch me go!" He reached into his wardrobe, grabbed a cloth and waved it. "So help me," he grinned, "I'll even shine old Dandro's shoes if that'll help."

Harl Varon went to the door, then turned back. "Only one favor," he said.

"What's that?"

"Don't talk about this. We're both of us going to be too busy to waste time gossiping."

He went out, and returned to his writing with a new enthusiasm.

Kort Dandro examined the banknotes closely. He turned them over, recounting them. Then, he looked sharply at the man before him.

"Where did you get this money?" he demanded sternly.

"From a legitimate source," Harl Varon assured him. He took a folded sheet from his pocket and handed it across the desk. Dandro accepted it, unfolded it, and sat back to read. He pursed his lips judicially for a few moments, then re-read the lines. At last, he looked up.

"Well," he said, "that's very good. Very good, indeed." He shook his head slightly, then looked reproving. "But it seems a little extra legal for you to accept employment with another concern when you are sponsored here, now doesn't it?"

Harl smiled at him. "This wasn't exactly employment," he assured. "Under the law, the production of a

work of art, or an original musical or literary composition is not regarded as contractual employment. Such things, you will remember, unless specifically commissioned, remain the sole property of the originator or composer, and are not subject to lien until sold." He took a breath. "Of course, money proceeding from the sale of such items is subject to all legal obligations. I am satisfying my legal obligations by tendering the full amount of my debt to the Employees' Welfare Fund, with interest as prescribed by law."

Dandro tapped on his desk for a moment, fingered the folder before him, then looked about the office. "But all this unnecessary ceremony," he objected. "Why couldn't you have simply come in quietly and presented your payment? We could have taken care of it without any fuss or disturbance." He looked unhappily at the uniformed protector, who watched with a professionally bored expression.

"I have no doubt. I suppose you could have taken care of it very nicely," agreed Varon, "but there is a certain procedure formulized by law. I have followed this procedure to the letter. I have deposited my Bond of Independence with the Chief City Magistrate, together with an amount equal to twice my known indebtedness. I have prayed the protection of the Lord Protector of Bardon, and in turn, he has assigned a member of his own Protection Division to witness my Certificate of Clearance, to assure that the law is complied with, and to ascertain that I leave the premises in an orderly manner."

Dandro waved an impatient hand. "But don't you see, man, you have been under the protection of the Lord Dornath ever since we decided to sponsor you over a year ago? Now, why don't you just remain under that protection? We can forget this little incident, and you can return to your regular place with no trouble at all." He frowned thoughtfully, then nodded his head judicially. "No trouble at all," he repeated. "I can safely assure you that we won't press any charges for conspiracy if you drop this matter here."

Varon shook his head admiringly. "That is very kind," he acknowledged, "and I appreciate it. But my present status differs from my former position, you see. Yesterday, when I was under the sponsorship of the Lord Dornath, and subject to the rules of this Establishment, my sponsor granted me privileges as an obedient employee of the House of Dornath. Today, since I have become an independent citizen of Bardon, the Lord Protector of that city, my former sponsor, protects my rights." He paused, the smile fading. "These include," he added less pleasantly, "the right to be free of illegal threats and unlawful coercion."

Dandro waved his hands. "Yes, yes, of course." He glanced at the protector, who looked a little less bored. "Very well, if you are so insistent, go

ahead over to the quarters and get your personal belongings. I'll have your Certificate ready when you come back." He turned. "Cara," he called, "come here a moment."

Varon went out, followed by the protector.

As they came to the gate, Harl set his new leather bag down and opened it. The guard glanced at it casually, then waved. "Oh, go ahead," he ordered.

"No," Varon told him, "you must be certain that I am not removing any Establishment property from the premises. Then you must sign this certificate—right here."

The guard followed the pointing finger, then looked up. "Smart, aren't you?"

"Careful," corrected Varon.

They went out on the street. Harl started to turn away as they came to the turbo-car, but the protector stopped him.

"Uh uh," he grinned, "we don't have to, but we're going to take you downtown again." He grabbed the bag, throwing it into the car, then got into the front seat, chuckling. "First time they've lost a man in twenty years," he laughed. He tapped his partner on the shoulder. "You should've seen those faces. Get in, Citizen. Where do you want to go?"

"You know Liro Clatir, of course?" The girl nodded toward the dance floor.

Varon nodded. "Yes," he admitted, "I've met her a few times. Very clever artist, I believe."

She laughed gayly. "Oh, yes. She's awfully clever for a commoner. Oh, very—but did you hear about that cute little affair a few nights ago at Doro's?"

Harl sighed inwardly. He made a non-committal reply and allowed his attention to wander over the room. A man was coming their way, making his path through the center of the crowd. The girl was contentedly relating the latest bit of malice, unaware that she had practically lost her audience. There was something about a party, "just loads of wine," some inelegant behavior, a bawdy remark by some member of the party.

". . . And what do you think she said?"

He laughed deprecatingly. "Why, I don't know," he guessed, "she could have said a lot of things." He drew himself up in an overdrawn imitation of hauteur. "For example, she could have said, 'I can't understand your allusion, sir. You may leave now.'" Disdainfully, he waved a limp hand.

She giggled delightedly, and Varon shook a finger slightly. "Don't steal it," he cautioned. "It isn't public domain yet."

The man had finished his journey, and stood before them. "I've been looking for you, Clia," he said. "Will you dance?"

"Why, I was just talking to Citizen

. . . Have you met Harl Varon?" She turned a little. "This is Merol Garalath, my fiancé."

The man took a small handkerchief from his lace sleeve. He looked disapprovingly at Varon. "Harl Varon," he repeated. "That doesn't sound like a name. It sounds like something from a protection charge sheet."

Clia made an indignant sound, but Varon smiled. "As everyone knows," he agreed, "that's exactly where I got it." He waved. "Of course you may dance with your fiancée." He turned and went over to the refreshment table.

A large man turned as he approached. "Oh, hello there, Varon," he greeted. A page approached, somehow managing to make a curtsy and hold the tray within easy reach at the same time. The large personage selected a glass. "Thank you, my boy."

"Please, your lordship." The page turned the tray toward Varon.

Lord Dornath raised his glass, looking at it critically. "Should be a little out of sorts with you, Varon," he remarked. "Understand you took one of my people some time ago."

Varon nodded. "I'm sorry your lordship feels annoyed."

The other laughed a little. "No, no. Quite all right. We have lots of men out there. Spare you one, I guess. What do you plan to do with him?"

"Why, there's quite a bit of work necessary on the cars. I really needed a good shop man."

"Oh, yes. Made something of a hobby of turbos, I understand. They tell me you've won a few road races. Good advertising for the Establishment, that, since you always use Dornath cars." The Lord Protector nodded thoughtfully. "Maybe I shouldn't be too annoyed with you after all." He paused. "One thing, though, about that man, Cenro."

"Yes, your lordship?"

"Let's not be trying to bond him to my protection. Afraid that'd be too much." He looked sternly at the novelist.

"Yes, too much all together." His lordship was judicial. "Not so bad when you put up bond. Valuable citizen, you know. Too bad to waste your ability, but this man's just an ordinary worker. Different matter. Completely different matter." He cleared his throat. "Most of these, um, independent citizens would be better off under sponsorship, anyway. We can't be adding to an unruly mob, you know." He turned away. "Well, I'll have to find Lady Dornath."

As he walked away, Harl Varon looked after him, then carefully set his glass on the table. "Thank you—Lord Dornath," he said under his breath.

He paid his respects to the hostess, claimed his coat, and went out to stand under the portico, waiting for his car to come up the drive. It was a clear, cold night. Overhead, brilliant points of light dotted a black, limitless back-

drop. Only near the horizon was there a suggestion of blue, just above the glow of city lights.

He stood, looking up. Familiar marker stars guided his gaze to a faint, blurred spot of light. It was insignificant in this sky, where many more brilliant points shone, but Harl Varon's memory penetrated the light-years. There, he knew, was a great cluster of stars, more than halfway across the galaxy. Within that cluster, was the star which Klion Meinora always thought of as "The Sun," and around it circled the home planet. The rest of the galaxy knew it as "Dorsil," seventh planet of "Mernar," but to Meinora and to the rest of his race, it was "The Earth," the final destination to which they always returned some day, somehow.

There was a metallic *click*—purposeful footsteps—another *click*. Harl Varon pulled himself across the light-years and back to the portico. The rear door of the car stood open, the erect figure of a uniformed man beside it. Varon stepped inside, then sat quietly for a few minutes as the car rolled through the drive and drew away from the estate. Presently, he leaned forward, opening the glass.

"Pull it over, Dorn," he ordered. "I'm coming up front."

"Well," he commented as the car gathered speed again. "We got flagged down."

"What do you mean?"

"Just like a three-car pile-up." Varon stretched his feet out. "Dornath waved a big, yellow flag."

"You talked to Lord Dornath tonight?"

"He talked. I listened. Can't figure out how he guessed my plan, but—Watch that corner. Guy thinks he's the only driver in town."

Cenro looked bewildered, but obediently slowed, then swung to the side of the road and stopped. A car burst out of the side street, swayed perilously for an instant, headed directly toward them, then swung away and whined down the road, leaving a smoky trail. Cenro looked back after the receding lights.

"If you hadn't warned me, that would've been a mess. But how—"

"I don't know. Just knew he was coming." Harl shrugged. Gradually he was discovering that the mental amplifier was just a convenience, not at all a necessary piece of equipment. *In fact* he thought, *it was almost like an unneeded crutch. When he got back, he—When?* He stared fixedly out at the lighted road, then shrugged again.

"As I was saying," he continued, "if I try to put up a bond for you, there's going to be a great big row. Fact is, the old boy's still a little mad at your getting out of the Establishment."

The driver cast a worried look sideways. "He's not—"

"Oh, no. No, he's holding still for it, but—"

Cenro grinned happily. "Well, then why should I worry?" He rapped a tattoo on the panel with his free hand. "I'd be asking you for a job if you did put up bond, so now I've got the job, so who cares?"

"You really feel that way?"

The car quivered a little as the control rod shook in Cenro's hand. "Chief, look. I don't know what it is, but it's there. When I left the quarters, I could almost feel 'em envying me. Some of 'em are afraid of you. Yeah, scared to death. But there isn't a man out there that wouldn't go off the roof if you hollered 'jump.'"

Varon stared at him. "Bad as that?"

His driver nodded. "I tried to fight it," he confessed. "That's why I was always pestering you. It was no use. Now, I just want to be around, that's all."

Harl Varon looked at the man for a moment, then sat staring ahead. He hadn't thought of this before, but it followed as a matter of course. Most of the people of this planet were satisfied, even pleased with the existing order. To them, it was right and proper. They looked for leadership, and felt lost when it was lacking. Cenro had been a rebel, but he, Varon realized, was a rare case. Swiftly, the possibilities ran through his mind. Why, he could—The city—The nation—The—Suddenly, he sat up. "No!" he cried aloud. Cenro jumped.

"Huh?"

"Nothing. Nothing at all. I was just thinking."

This, then, was the reason for non-contact. Here was the hidden danger. He could have fallen into the trap so easily. It might even become more attractive as time went on. He had to get away. Somehow, he must leave and never come back. But how?

Images coalesced. He saw the Dornath Establishment, and other great factories. Of course, that was it. A whole planet's efforts concentrated and guided would—

He slumped back into the seat again as the missing pieces of an ancient archaeological puzzle slid into place. It could have happened before. There may have been others, and some of them hadn't said no. Now, he knew the reason for some of those unexplained, furious orgies of destruction. The machine had been set up—placed into operation—the operator had gone away. Or perhaps the machine had run wild, its operator helplessly carried in the rush. No, it wasn't the temptation of power. That was childish. The real trap only closed when departure was attempted. He closed his eyes.

"Let's get on home, Cenro," he said. "I'm tired." Then, he realized that the car had stopped. Cenro was watching him tensely.

"What's wrong, chief? I never saw you like that before."

"Pray you never do again, Dorn. Just pray you never do."

Harl relaxed, watching the street flow by. As the turbo's whine accompanied his thoughts, he considered the complexities of a small galactic cruiser, comparing it with the simple vehicle he now rode. The technology, the philosophy of this planet were nowhere near the answers to some of the minor problems that would have to be resolved. How would you explain the intricacies of a sharply tuned magneto-gravitic generator to a technician who was barely familiar with elementary electromagnetic theory, and who knew gravitation only as an undefined force? How would a civilization still based on direct application of force hope to understand the principles of a neutralization drive? Of course, he remembered, the principles of neutralization had been touched on here, but their phase-neutralized power was simply returned to the generator—zeroed out. There was a little generation of heat, perhaps, but they couldn't yet pick up the secondary radiations, filter them out, and use them. They had no conception of sub-etheric phenomena, and they would be long in discovering secondary space.

He grinned to himself as he thought of an engineer, used to simple turbines, if that engineer were called upon to deal with the polyphase fields in a trans-light drive, then he seriously considered what would happen to a civilization with a long tradition of warfare if it were suddenly presented with truly destructive weapons. He shook his head, as he thought of the results of a modulated tractor beam released against fortresses designed for defense against ballistic contact and physical explosions.

Generations of philosophers, he realized, would have to think out their socio-economic problems, then other generations would have to work out the ethical formulae, the aesthetic equations, and the whole calculus of humanics. Nor was this an exercise for an outside consultant. Of course, the outsider might suggest—possibly could intrude an occasional problem or trend—but the real operations would be for the native philosopher to propose, the native scientist to explain, and the native engineer to perform.

He glanced at Cenro, who was piloting the car through the evening traffic with accustomed ease. The man was an intelligent member of his civilization. He was the equal, Harl knew, of many citizens of the Galactic Federation—in latent brain power, at least. There were more like him, too. A good many of these people might be educated and brought into the Galactic society as individuals, and integrated without serious difficulty, but this simply was not true of their culture. In association with the highly developed civilizations of the galaxy, some individuals of this isolated planet might grow, but their planetary culture would be submerged, not absorbed—destroyed, not developed.

The car drew to a stop, and Cenro jumped out to hold the door open.

"Anything more tonight, chief?" he asked.

"No," he was told, "better catch some sleep. We've got to start tuning up a car for the Dargfor loop."

Harl let himself into his apartment, still thinking. There might be a possibility of expanding the shop, and building a small "hopper." It wouldn't have to be very elaborate—after all, it was only a matter of a few light-years. He would need a drive, of course, and the parts could be ordered from—Could they? A lot of them would have to be machined right here, and there was the question of machine tools. He could describe a molecular spray to an engineer from, for example, Storanath Engineering, but would the engineer be able to follow the explanation, and where would he get some of the specialized material he would need? What would be the repercussions on the civilization if he did understand, get the material, and produce the item?

Varon laid his pen aside. Even a communications set, he realized, would be out of the question. He could gather some parts. Others, he could make, but there were some essentials beyond the technology. And the power supply! New concepts would have to be introduced. A galactic communicator, even a simple one, would require components which would bewilder technicians and frustrate this culture's scientists.

He leaned back in his chair, looking at the walls of his study. No, he decided, this would have to be home for a long time. Of course, he could amuse himself by setting up test equipment and introducing small improvements in the vehicles normal here. Possibly over a long period of time, he could propose problems which would prove constructive. Again, he leaned over the desk. There was work to be done, and the Dargfor race was due in a very few weeks.

A light haze of dust and smoke hung over the town of Dargfor. All available space outdoors was taken up by people and cars. Here and there, light bleachers had been set up. In every courtyard, mechanics were busily making their final adjustments on motor and running gear, watched from windows by children whose parents were busily selling refreshments, souvenirs, or parking and sitting space. The burghers of Dargfor watched the annual race, and enjoyed it, but not to the exclusion of business.

In one court, close to the starting line, Dorn Cenro straightened and looked at the motor he had been working on.

"There," he said, stretching, "now I'll get the casing on, and she'll be ready to roll."

"Couldn't you set the burners a little closer?"

Cenro looked critically at his work. "Don't know about that," he said

slowly. "I've already cut the factory tolerance plenty. It'd give a little more punch, of course, but if he ever loaded her up too much, he'd have some burned tubes." He looked around. "I'd rather leave it the way it is."

Harl looked at the burners again. "Well, maybe you're right at that," he decided. "Go ahead and button it up."

The mechanic nodded, reached for a wrench, then turned again. "Say, chief."

"Yes?"

"I just happened to think. I never used to give you arguments before. Nothing ever went wrong, either. What goes?"

"Everything goes as it should." Varon grinned. "When you stop arguing with me, Dorn, we'll all have something to worry about."

"I don't know." Cenro started bolting a plate. "Was a time we used to win 'em all." He cinched up bolts, then leaned over into the driver's compartment and snapped on the pre-heater switch. For a few minutes, he watched the gauge, then he opened the fuel valve and flipped the igniter switch. There was a minor blast and a puff of black smoke shot out of the exhaust stack. Cenro adjusted a knob, watched as the smoke cleared, then watched a gauge slowly climb. At last he stepped back.

"Hey, Val," he called, "you can have her now."

"You don't have to shout," a voice drawled. "I've been watching for five minutes."

Cenro turned. "Oh," he grinned, "might have known it. You're the guy's gotta risk your hide in this thing. I suppose you might be interested in the set-up."

Val nodded. "Yeah, might be at that." He slid behind the controls, checked the gauges critically, then nodded at Cenro and eased the throttle open. "Be back pretty quick," he promised.

The car rolled out of the court to the square, joining the turbos at the starting line.

The starter looked over the line-up carefully, then watched an official who walked down the line of cars, looked at each one, then waved. The starter waggled his flag, then waved it in wide, vertical sweeps. Drivers pulled their control rods to them, punched fuel levers, and a cloud of smoke-filled dust arose, hung for a while, then drifted slowly away.

As the cars wound through the town, one left a thick cloud of black smoke. An official waved a black flag at the driver as he passed. A short distance ahead, another official waited, flag in hand. The smoke faded to a faint line. The cars fled out of the town, climbed the long hill, went out of sight for a moment, then reappeared, climbing the ridge. At the top, they seemed to poise themselves for an instant, then swept down the multi-curved road, screamed around the right-angle turn

into Blagor, flew over the bridge, and took the valley road, their blowers shrieking angrily as they passed through the narrow street between the houses of Morchfar. In the square, they turned sharply. One car went into a screaming slide, struck the fountain in the center of the plaza, bounced, and came to a stop. The driver crawled out, looked around quickly, and leaped to the shelter of the council hall doorway. An official, flag in hand, ran to warn other cars of the danger as men pushed the wreckage out of the course.

Cenro shook his head, lowering the glasses.

"Every year," he growled, "the Association has to buy a new village pump for Morchfar." He raised the glasses, scanned the road, and picked up the cars again.

"Monotonous, isn't it," Varon laughed. He was watching Val's handling of the lead car. Number Twelve was not far ahead, but it was in front, its lead gradually increasing until it disappeared in Pilgroum.

As the last car entered the twisting streets of Pilgroum, the crowd relaxed. It would be a while before the leaders came into sight again, winding through the valley and coming up the long hill road to the finish line. Vendors hurried through the crowd, taking quick advantage of the chance to quench thirsts or to satisfy desires for even more souvenirs.

Cars appeared at the shoulder of the hill, slid perilously around the curves, dipped into the valley again. Varon checked the numbers, then exclaimed in surprise. Twelve was no longer leading. Cenro looked, then waved his glasses frantically.

"He's out of the money, chief," he wailed. "What happened back there?"

Varon was still looking at the cars. Twelve was gaining, but there was very little time left. "I don't know," he said. "Doesn't seem to be anything wrong with the car."

The leaders screamed eagerly up the twisted hill road, slid around the S curve by the tavern, and cut their speed as the starter stabbed at them with his flag. Cenro kicked unhappily at the wall. "Second!" he complained. "My fault, too. I shoulda set them up like you said." His footsteps dragged as he followed Varon downstairs into the courtyard.

Number Twelve rolled in through the arch. The driver cut his valves and climbed out, removing helmet and goggles. "Sorry, chief," he apologized, "she got away from me on the switchback outa Pilgroum. Like to went over the side, and three cars passed me." He turned to Cenro. "Better check the tubes," he added. "I let her get too hot catching up. Nearly scorched her out, I think."

Harl Varon looked at Cenro. One eyebrow lifted a little, and he twisted his mouth. Cenro grinned, then nodded.

"Well," he said, "can't win 'em all,

at that. Come on, Val, gimme a hand loading her. Chief's gotta go to the Association ball tonight, remember?"

"Too bad you're not driving any more, Varon." The officer looked down at his ornately decorated blouse, then glanced up again. "I remember some years ago when you were one of the top drivers."

Harl smiled. "You get older, you know," he commented easily. "Can't figure them so close." Actually, he knew he was the youngest person in the room. Not in years, of course, but these were all mature people of their culture. He was still a schoolboy, playing truant, lessons incomplete. Some day, he hoped, they would come for him, but how old would he be then? How long would he have to restrain his questing senses to avoid injuring those around him? He forced his attention back to his companion, who was discoursing on turbo-car racing and design. The man knew his subject, but even so, the problems he discussed sounded elementary. Varon agreed with him, made a few comments, and got away. He strolled about the room, greeting friends, stopping to exchange a few words, then going on. A snatch of conversation attracted his attention.

". . . And such an insight. He's one of the world's great thinkers, actually. Pity he never married."

He turned away again. Yes, that was another thing. Sooner or later he might have—An elderly man touched his shoulder.

"Varon, what do you think of the theories of this man, Yeldar?" The old hands clasped pontifically. "Now, personally, I think he—"

In truth, Harl thought, Welin Yeldar was a confused man. He had started with something valuable. A thin, shining thread of pure reason was there, but the man had used it to bind together such a confused mass of predjudiced ideology and fallacious opinion as to tangle it beyond use. Then, he had forced the entire mass into a wrapping of cumbersome, ambiguous verbiage. The Yeldar theories, Harl had decided, really became whatever an interpreter felt he should make them. Here was a retreat, rather than an advance in philosophy. He knew it would do little good, however, to express this opinion. After all, the old gentleman was almost as confused as Yeldar. He made a few mild criticisms of Yeldar's writings, complimented the elder on his penetrating analysis, and walked out on the balcony.

For a few minutes, he looked down at the glittering lights of the city. It spread out in the valley, extending almost to the distant line of rolling hills which outlined themselves darkly against the sky. It was a good city, he knew. Of course, there were inequalities. Progress was uneven. Many people were unable to grow to their fullest capabilities, and others were

rewarded far beyond their intrinsic value, but it would grow and mature. The whole civilization would grow, though that growth would be painful at times and violent at others.

One line of lights stretched out beyond the city, to disappear in the hills. He traced its course, then looked up into the sky. The far away stars twinkled a little near the horizon, then the ones toward zenith became hard, sharp points of light. He picked out the small point which was a great cluster, where space liners crossed between the stars, where small personal ships cut through the void, bearing their owners to distant planets, or perhaps homeward.

"Homeward," he murmured. "Some day, maybe."

He turned, looking inside. They were dancing, some of them. Others were talking. Still others were crowded around the refreshment tables. He could go in there, mingle with them, join their conversations. They would welcome him. He was accepted, trusted, even respected here. He had made a place for himself in the city of Bardon and in the Menosian nation.

But he was lonely.

From the city rose a faint, formless sound, the resultant of all the activities of a busy center of population. It was composed of many things. There were the thuds of heavy machinery, the calls of people, the cries of pets, occasional crashes as something was dropped or broken, but overriding all was the whine of turbo-cars. Day and night, the voice of Bardon was characterized by this whine, which varied in pitch and intensity from hour to hour, but always dominated other noises. Varon looked along the avenues, watching the long lines of moving lights, listening to the throbbing whine, and recalling the pungent smell of exhaust gases. It was, he thought,

the smell and sound of immature development. He remembered an article he had read, which claimed that the exhausts of turbo-cars and trucks actually raised the temperature of Bardon several degrees above that of the surrounding countryside.

He leaned over the rail. The heat could be used, the wasted fuel didn't have to be wasted. The noise could be minimized. Much of the excess heat could be converted to power. Fuel mixtures could be controlled. Simple neutralization would bring quiet to the turbos, and the extraneous field set up by neutralization could be—

He paused, looking into the sky, then glanced into the ballroom. No, the extraneous field could be dissipated into space. One unit would make very little impression, but thousands could join their screams to span the far reaches. It would be unintelligible, but it would not be ignored. He took a last look at the sky, waved, and turned to re-enter the ballroom.

For a while, he talked casually to various people, then he walked downstairs.

The doorman looked up as he approached. "Good evening, Citizen Varon," he greeted. "Leaving so early?"

"Yes, I think so. Thought of a way to improve that car of mine, and I think I'll be at it before I forget."

The doorman nodded. "I saw the race today, sir. Too bad your man had that accident. He'd have won otherwise." He touched a button. "Citizen Varon's car," he ordered.

Varon grinned. "Wait till you see what we do next year," he prophesied confidently.

The low sportster pulled up to the door, and Cenro started to get out. Varon waved. "Never mind, Cenro," he instructed. "Just move over. I'll take her." He slid into the seat back of the control rod, closed the door, and pulled back the handle. The car slid smoothly away, emitting a satisfied purr. As he reached the street, Varon paused, then pulled the rod back and to the left. The purr changed to an eager scream as the car sprang around in a curve, then straightened and arrowed down the street.

Cenro sat back, watching the road for a few minutes, then looked over at Varon, who was sitting in a relaxed position, handling the control with one hand. Occasionally, his left hand darted out to make an adjustment on the control board. Cenro shook his head wonderingly. How anyone could sense the engine action without checking the gauges, he had never been able to understand. Varon never took his eyes off the road, and never missed an adjustment. When he drove, there was no trail of smoke, no trace of overheating, no skip in the constant scream of the blower and turbine. Cenro had asked about it, but the only answer he had gotten was, "Oh, I just drive by ear, I guess." He looked back at the street. There was something

besides keen hearing involved here, and he knew it.

The car slowed, then swept into the drive and stopped at the shop entrance. Cenro got out to open the door. Varon put the car away, then came out.

"Let's go inside," he said.

Cenro followed him through the living room, into the study, then took the indicated chair and waited. Varon sat down before his desk, then leaned back.

"Dorn," he asked, "just how efficient are these turbo-cars?"

"Why, I don't know. I always thought they were pretty good."

"No, that's not exactly what I mean. What is the percentage of fuel heat that they actually deliver as road power?"

Cenro thought for a moment. "I think they'd average out at about sixteen per cent," he said. "There's a lot of lost heat."

"Suppose we grabbed up another ten per cent or so, and turned it into useful power?"

Cenro grinned. "Dornath'd be after the patent."

Varon nodded. "I think we can do just that," he announced, reaching for a sheet of paper. "Right now, we're using a steam turbine for a power source. We blow air in under pressure, the fuel expands as it burns, and we lead the gases through a series of pipes to an exhaust. Somewhere along the line, we use a portion of the heat produced to make steam, which expands and drives a turbine. We then steal a lot of the turbine's power to drive the blower and pump fuel. What's left, we use to drive the car. Right?"

"It figures. But where are we going to save any of it?"

Harl sketched rapidly. "Gas turbine, right here," he explained. "Use up the expansion energy of the gases, as well as their heat. The flow'd be something like this."

Cenro took the paper, examining it thoughtfully. He sat for a few minutes, thinking, then crossed the room to the bookshelves. Varon watched him silently. The mechanic selected a book, leafed through it, then stopped to read. He looked back at the sketch, then seized a pen and did some rapid figuring. Finally, he looked at his employer.

"It might work, at that," he said. "We could drive the auxiliaries with the gas turbine."

"Exactly." Varon nodded. "Maybe with a little power left over. You're the chief mechanic here. We've set up quite a shop by now, so you have something to work with. Work it out, we'll get a patent, and I think Lord Dornath'll be very happy to offer you his protection as an independent citizen."

Cenro shook his head. "It's your idea," he objected.

"Not after you get through working on it," Harl told him. "By that time, it'll be all yours." He paused. "Remember, you'll be doing all the de-

velopment. I'm just a writer. You're the engineer on this project."

As Cenro went out, Varon nodded to himself slowly. This operation would accomplish several purposes. He reached for more paper.

"Now," he told himself, "if I can just remember my sub-etheric theory." He sketched for a while, humming softly to himself, then leaned back, holding the sheet up and studying it critically. "Yes," he said, "a good example of undamped Ricora neutralization." He stood up, putting the papers into a folder.

The shop was filled with the high-pitched whine of a blower working at maximum. Underlying and accentuating it was the hissing roar of an unmuffled exhaust. As Varon touched his shoulder, Cenro looked around. He closed valves and the exhaust roar died. Slowly, the whine dropped in pitch, becoming a growl, and finally fading as Cenro closed another valve.

"How's it coming, Dorn?"

"It's going to work, chief." Cenro gestured toward the motor on the test block. "Weight power ratio's down five per cent, and the fuel efficiency's up twelve per cent. This thing's going to go!"

"Wind her up again," said Varon. "I want to see this."

Cenro glanced at the gauges, then cracked a valve. The motor started turning. He opened the fuel valve, punched the igniter button, and waited as the exhaust roar built up. Automatic clutches operated, and the blower whine started rising in pitch. Presently, he pulled the throttle, and as the room filled with noise, engaged the drive to the dynamometer. Varon watched with him as the indicators rose to a constant reading.

"Starts easier then the old ones, too," shouted Cenro. "Put in a pressure booster for the starter and some automatics while I was at it."

Varon was still checking readings. Finally, he straightened, and drew a finger across his throat. Cenro shut the machine down, and the din subsided.

"Noisy, isn't it?"

Cenro shrugged. "Just as much racket as any of 'em," he agreed. "I'll have to stick on a muffler and some soundproofing in the engine compartment, of course, before we can put it on the road. Lose some power that way.

Harl shook his head and gestured with a thumb. "I think I can fix that," he grinned. "I've been fooling around a little, too. Come on over here."

He led the way to the small room he had ordered partitioned off. Inside, two small motors were mounted on test stands, side by side. Cenro looked at them curiously. Other than a few unconventional fittings, they looked like ordinary turbo units. Varon walked over to them, going through the starting routine.

"I thought I'd try neutralizing the sound instead of muffling it," he explained, pointing to the fittings. "These are for cross connections at various points. Now, listen to the results."

The two motors started to build up speed until the room was deafeningly full of the characteristic sound of turbo drives at full load. Varon started cross-connecting the fittings. As he added rods and tubes, and opened valves, the noise changed in character. At first, a throb appeared, then the whine changed, to develop a hesitant, rasping quality. As Varon opened the last valve, the noise suddenly subsided. He fastened a few rods to the exhaust systems, opened more valves, and the motors were virtually silent. A faint hum indicated activity, but the usual whine and roar were gone.

Cenro looked at the assembly in surprise, then examined the dynamometer. The power had fallen off a little, but not so much as it would have with conventional sound deadening. Curiously, he reached out and felt a few rods and tubes. There was a slight vibration. Varon chuckled a little as he watched.

"I think I've got a new principle," he commented.

Cenro was still touching rods and tubes. Finally, he reached to scratch his head. "Yeah," he agreed, "it's new, all right. I see it. It works. But I still don't believe it. What goes on?"

"Sound neutralization," he was told. "It seemed like a good idea, so I started playing with it a while ago. I got it to working by rule of thumb, then I started figuring it out. Now, I think I can make it work on any multiple system, and I can explain some of the basic theory so that an engineer can build new equipment, but I still don't understand all the theory back of the thing." He picked up an instrument. "The general idea," he added, "is to phase all the sound from both systems so that they cancel each other without any out-of-phase reinforcement. I found the nodes and peaks with this indicating stethoscope, then I started interconnecting until I got cancellation. "With careful design, a prototype can be built, the thing can be figured for predetermined placements, and silencers can be built in at the factory. I'll go into the practical design with you, and maybe we can adapt it to work with your new motor. Then, we can put the whole thing in a car that should take the rest of the Association jobs like a sportster taking a miniature family sedan."

Cenro smiled wolfishly. "The specialty meet at Noralmo is coming up pretty soon," he mused. "Chief, if we can put this thing into a street sportster, leave on the lights, fenders, and everything, and still mop up that bunch of radicals, we'll have something."

The usual dust and smoke enveloped Dargfor, but the whine and roar was

missing. As usual, space was at a premium. Mechanics were busily making their final adjustments, but the cries of the vendors were plainly audible, competing only with one another. As the cars rushed away from the starting line, an Association official strolled over to join Varon and Cenro.

"You know," he said, "these new motors of yours are a marvelous piece of engineering, but there's still one flaw."

"Oh?"

"Yes, and I've a personal objection, too." The official gestured around the village. "It's too quiet," he added. "That's the personal objection. The flaw is those neutralizing rods. They're too short-lived. I've never seen one last half a year. The tubes stand up all right, but the rods seem to get brittle and shatter."

Varon nodded. "Yes, I know," he agreed. "Of course, they don't cost much, and they're easy to replace, but it is a nuisance, I'll admit. Cenro and I've been working on it for some time now, ever since the first ones gave way. I think we have an answer. We're trying it out on Number Twelve in this race, and it's been on the test block for some time."

He smiled inwardly. Of course, there was an answer. He had worked that out along with the original sound neutralization, and this was its first public test. Of course the rods were breaking. They were giving up their substance—their very life—to provide power for a sub-etheric disturbance that cried to the stars. He looked at the cars as they came to the top of the ridge. These, and thousands of other turbo-cars were devoting a small percentage of their power to a signal. No one of them would be able to penetrate the reaches of space, but when you considered the thousands of cars using the Cenro-Varon motor, you were contemplating tremendous power. He looked at Number Twelve, the only car in Menosia, and possibly one of the very few on the planet not radiating a screaming signal. The little nullifying crossarms would feed the lost power back into the motors, giving a little more punch to the driving wheels. The nullified silencer bars would outlast the motor, and no one would have any clues to lead him into frustrating research. All that would come later—generations later.

"Yes," he added aloud, "our tests'll take some time, but we're trying out a new arrangement on the neutralizing bars in this race. If it works out as we expect it to, we'll be ready to announce it. Then, no one'll have to replace a set of rods."

"Funny," mused the official, "at one time, we thought nothing of listening to a howling blower while we were driving. Now, a silencer bar breaks, and everyone's teeth stand on edge. I've seen cars stop almost instantly. The driver'll get out, grab a spare set of rods, bolt 'em in place, and then go, just as though the car wouldn't run

without 'em. Everyone seems to carry a spare set." He paused. "I don't know, though," he added, "somehow, I wish they'd drop the rods off during a race. There's something about the howl of a blower and the roar of an exhaust that makes the run seem more real. That start seemed somewhat ghostly to me."

There was some sound. Tires complained bitterly as the cars took the curves and the right angle into Blagor. The bridge rattled its annoyance, and the wind of passage caused audible concussions as the cars tore into Morchfar. The leaders slowed at the town square, took the sharp turn for Pilgroum, and seemed to fly as they passed between the trees of the valley road. There was a sudden wail as tires fought a losing battle for traction. Then a crash sounded.

As the driver crawled out of his car, Varon turned with a grin.

"Morchfar," he commented, "doesn't keep its town pumps much better than the cars keep their silencer rods."

The Association man nodded. "It's a fixed expense," he laughed. "That pump is assessed at two hundred crowns a year. Take a look at your annual statement."

Varon watched the lead cars disappear on the Pilgroum streets, then glanced over at Cenro. He grinned to himself as he thought of the change in his former mechanic's status. "Cenro" was almost a household word now, with a major percentage of all cars using the Cenro-Varon motors, and practically all cars using Varon-Cenro silencing rods. Citizen Dorn Cenro was an honored member of the Menosian Turbo-car Association, drove in some of the meets for owner drivers, attended most of the balls, and was even acquainted with the Lord Protector of Bardon. Varon could still remember the growling acceptance of the revolutionary royalty proposal.

"Well, all right," the old nobleman had grunted. "Since you insist, a payment per vehicle sold isn't actually illegal, of course. Never heard of it, though. Of course, we'd have exclusive use?"

"Certainly, your lordship," he had been assured. "To all intents and purposes, the patent is yours, subject to the royalty payments. You can license other manufacturers to use it, to be sure, but that, as well as the matter of fees, is entirely your own affair."

The Lord Protector had brightened a little. "Mean we could use this royalty business with other firms, eh?" He had stopped to stroke his chin. "Suppose we pick up two or three crowns per vehicle over and above your payment?"

"It would be entirely up to you."

"Yes, yes, I see. Yes, prossibly an ordinance could be passed prohibiting noise—Do your know, Varon, I rather like the idea after all."

The shriek of tires heralded the approach of the leaders, and Varon

turned to watch them come through the S turn. The tavern sign swung wildly as the suction from the cars dragged at it. Number Twelve crossed the finish line, killed its speed, and spun into the side road. Cenro solemnly shook hands with himself.

"Third in a row," he exulted. "We can hang up a permanent trophy."

"That we can," agreed Varon. "Guess that extra bit of power paid off."

"Yes, that extra push." Dorn looked at his partner. "Where did it come from, chief?"

Harl shook his head. "It's just the power we were throwing away in the original silencer set-up," he said. "I can't say where it was going, but we're using it now." He turned toward the areaway. "Well, let's get on back to the shop. I want to check that test job of mine.

Cenro grinned. "That combustion servo you've been working on?"

"Yeah. I've got plans for that." Varon nodded. He had plans. The throb of the undamped combustion servo would be distinctive, and with a fair share of the motor output going into the reinforced neutralizing bars, it should act like a beacon to anyone with the proper equipment. Someone should be investigating by this time, and he wanted to meet them.

And someone was investigating. As the car turned into the driveway, Chief Observer Kmolar turned his attention from the motor on the test stand. Quickly, he checked his body shield to be sure visibility was properly cut out, then he directed a questing thought at the occupants of the car. He recoiled a little in surprise at the power of the answering thought.

"Guardsman?" It was a sharp, controlled beam, carrying a tiny overtone of longing.

Kmolar identified himself, then started interrogation. Now, he identified the being before him. A humanoid. To be expected—this was a humanoid world. The small creature before him shielded its mind for a time as it spoke to its companion, who nodded, and left. Kmolar checked him for a few minutes as he walked away. A native, he knew little of the galaxy, nothing of Kmolar's race, nothing of life outside his own planet. For the moment, the observer dismissed him, concentrating on the other.

Klion Meinora relaxed in the seat of the car, answering the questions and reveling in direct mind-to-mind contact, even thought Kmolar was of totally different species, and somewhat critical of Klion's actions, at that. He explained his presence and activities, outlined his method of communication, and his steps toward elimination of the interference now that it had served its purpose. Finally, Kmolar radiated comprehension.

"So," he thought amusedly, "you were after a graduate thesis, with no criminal intent, and you ended up by

cutting out communication over an entire band. How long did you say you'd been here?"

Meinora sighed. "Twenty-five or thirty cycles."

"Quite a while," the other told him. "I suppose you realize you'll have to spend some more time clearing up?"

"Yes. I knew that long ago."

"Well, it could be worse. You'll have a couple of cycles back at base, training. Then, say five or six here, to be sure no permanent harm's done. Then, there's the compensation service. It shouldn't take you more than twenty more cycles." Kmolar's thought trailed off, and for a time there was a vision of a blue misted, sandy plain. "Well, let's get started on the arrangements for your temporary departure. We'll have to leave the way open for you to come back. Any suggestions?"

The small patrol ship came out of trans-light just outside of the system. It stopped, spun slowly around in a full roll, hesitated, then headed sunward, feeling its way at half a light. Guardsman investigator Klion Meinora checked over his instruments, then shook his head. The proof of a theorem can sometimes lead to strange bypaths.

Apparently, someone was castaway here.

And, someone was trying to get away.

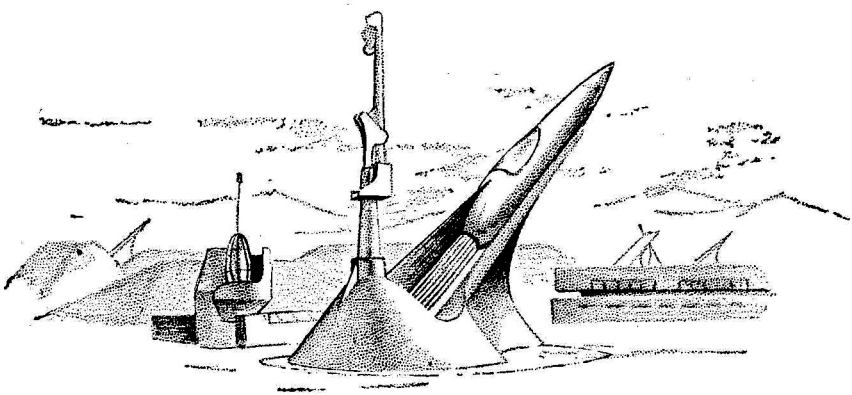
So, someone was building a technology.

And, someone was working hurriedly and recklessly.

So, something would have to be done about it.

That was what he was here for.

THE END



THE LONELY MAN

BY FRANK M. ROBINSON

There was *no solid, logical reason for believing he was anything but a lonely man. Certainly he was lonely, but as to being a man . . .*

Illustrated by Orban

The light in the room was bad. It came from a green-shaded, sixty-watt bulb that dangled from the end of a long, frayed cord and cast a circle of light on the concrete floor, leaving the corners thick with shadows. It was a bigger than average, drab room with gray concrete walls and just enough secondhand office furniture to keep it from looking empty.

Detective Lieutenant Schwartz walked into the room without knocking. He paused somewhat uncertainly, then carefully placed his hat on the battered table against the far wall and methodically started to loosen his tie.

"Don't bother closing the door," a voice said. "It's too hot in here as is."

Schwartz turned. Captain Manuel Mantusek was behind the desk in the corner, mopping little beads of sweat off his forehead. He was a big man with lots of stomach and he sweated easy. The one window in the room was open but it didn't help much. The hot, sticky night air crawled through the bars and brought the odors of the alley just outside along with it.

"You've been gone a long time," Mantusek grumbled.

Schwartz took off his suitcoat and folded it. He was a small man and a neat dresser—as neat as a man can be who wears a seersucker suit in the middle of summer.

"There was a lot to do, Manny." He sounded worried.

Mantusek squinted at the crossword puzzle on his desk and made heavy, deliberate marks on the gray newsprint.

"What'd the Embassy Apartments want?"

Schwartz sat down in a chair but he didn't relax. His voice was dry. "They had an accidental death."

The captain looked up sharply. "Who?"

"A man named Haskell—Norman P. Haskell. The P doesn't stand for anything. Maid found him in the bathtub."

Mantusek went back to his puzzle. "Who do we have to notify?"

Schwartz fumbled nervously for his pack of cigarettes, then threw the pack to the fat man behind the desk.

"Nobody. No friends, no relatives."

Mantusek thought about it for a minute, then shook his head. "Can't buy it. He must've had dough to live in a Gold Coast apartment and if he had dough, he more'n likely had friends and relatives."

"I didn't claim he was a floater, Manny. Just no relatives."

"Anything else?"

Schwartz forced himself to relax and leaned back against the dirty concrete wall, gingerly balancing his chair on two legs. "There was two hundred and six dollars and some change in his billfold. Three suits in the closet—hardly worn. Two pair of shoes—almost new. No jewelry, but I don't think he was the type to wear any."

A boy came in with a paper sack. Mantusek took it and pulled out two cans of beer, clammy with condensation. He rolled one across the desk to Schwartz and pawed in his desk drawer for an opener.

"Any letters around, any addresses in the wallet?"

"No letters, no addresses—nothing to show that he knew anybody at all."

Mantusek found the opener and punched two holes in the top of his beer can. He ran a beefy hand down the sides to sluice off the sweat, then raised it to his lips. He was strictly the gulper type. He drained half the can and wiped his mouth with a hairy forearm.

"Anything in the wallet besides the dough and his name?"

"Social Security card, auto license, and one of those cards you get when you register to vote."

Mantusek pulled at his thick, lower lip with his thumb and forefinger. "It don't add. He should've known somebody, there should've been some letters or addresses around."

Schwartz sipped at his beer, letting the cold liquid go down easy. He wished it was something stronger, a lot stronger. "That isn't all that doesn't add." He paused. "The Social Security card is a phony, he never owned an automobile, and he never voted in his life."

The fat man finished off the can and squeezed in the sides with one hand. "Maybe some wealthy guy wanting to disappear for a while and having phony identification made up." He frowned. "You sure it was accidental?"

Schwartz nodded, somewhat uncertainly. "I . . . think so. We bent him over the side of the tub and emptied a lot of water out of his lungs and stomach. Doc thinks he died about five this afternoon. We'll know more about it later on this evening. Doc's going to call us when he finishes with the autopsy."

"Maybe somebody held Haskell's head under."

"No signs of a struggle—only a small bump on the back of his head."

Mantusek shrugged. "So he's an old duffer who slipped on the soap."

"He wasn't old."

"How old?"

"Sunny side of thirty—couldn't tell exactly how sunny."

Mantusek pulled a scratch pad and a pencil out of a desk drawer. "Gimme the rest of it."

"Black hair, all his own, good hairline. Five nine, one sixty, slender but well built. No identifying scars, no vaccination marks. No dental work of any kind, no fillings at all. No signs of operations or broken bones. No callouses, no corns, no outstanding physical blemishes. No bruises, contusions, or any other signs that it might have been murder—just the bump on the back of his head." He hesitated, about to say something more, then changed his mind. "That's

all."

The fat man drummed his fingers on the table.

"Few people get to be thirty without any dental work or scars or vaccination marks."

"This one did."

"You got any suggestions?"

Schwartz shivered. It was a hot muggy night, one of those summer nights where if you went to bed you drowned in your own sweat. But he still shivered.

"I think we ought to send a man over to lift prints in the apartment. And I think we ought to talk to some of the people there."

Mantusek nodded. "Good idea. *Somebody* must've known the guy."

"Name?"

"George Miller."

"Occupation?"

The voice was a monotone. "Night clerk at the Embassy."

Schwartz looked at the man shrewdly. He was thin, about thirty-five, with neatly combed brown hair that was just beginning to recede. A chain smoker—a nervous one—with the quiet, unassuming personality that night clerks the world over seemed to have.

"How long have you known Haskell?"

Miller blew smoke out of thin nostrils and tried to stare at the ceiling. The solitary bulb and its shade got in the way. "A couple of months now. He moved in the last part of May."

"When did you first meet Haskell?"

Miller's face was blank. "I don't know if I can remember."

"Try."

Miller worked on his cigarette for a few, quick puffs, staring off into space. The seconds crawled by.

"It was in May," Miller said suddenly. "Raining out, a regular downpour. Everybody was carrying umbrellas and wearing raincoats and galoshes and tracking mud in on the lobby carpet. Then Haskell comes in. He isn't wearing anything at all."

Mantusek interrupted from the shadows. "Nothing at all?"

A nervous tic worked briefly in Miller's cheek. "I mean no raincoat or anything. Just a regular suit. He was soaked through to the skin but he didn't seem to mind it. I tagged him as an odd ball."

"He could have been caught in the rain," Schwartz suggested.

Miller shook his head.

"It had been raining steady all day. He looked like . . . he looked like he enjoyed it."

Schwartz made a note to remember the comment.

"Did he go out much?"

"No."

"Did he ever go out with anybody?"

"Not while I was on duty."

"Did he ever have visitors?"

Miller lit another cigarette with the butt of his first, then crossed his legs and scrubbed the butt out on the

sole of his shoe.

"Haskell wanted for something?"

"We ask the questions," Mantusek interrupted again. "You just answer them."

A little red showed around the night clerk's collar. "No, he didn't have any visitors."

Schwartz pushed back in his chair. He tried to keep his voice level but a trace of gravel crept in.

"Mr. Miller, doesn't it strike you as odd that a man, a young man, should be a recluse in an apartment-hotel and not go out and not have visitors?"

"You're the police," Miller said quietly. "I never thought about it much."

Schwartz let it go. The smaller the man, the more they hated being pushed around, even verbally.

"Did he have an apartment with kitchen privileges?"

"Yes."

"If he had a kitchen in his apartment and supposedly used it, then he'd have to go out for groceries, wouldn't he?"

Miller didn't change expression. "I wouldn't know. I'm the night clerk."

Schwartz reddened but didn't say anything. He needed to know whatever the night clerk might know about Haskell, and he needed to know it desperately.

"At one time or another most people go out to a delicatessen at night. They run out of things."

"Haskell didn't."

Schwartz hesitated. "Did Haskell speak with an accent, like he was a foreigner, a DP perhaps?"

Miller shook his head emphatically. "He used good English. Almost too good."

"What do you mean?"

"He didn't use any slang, he didn't have any kind of an accent, nothing like a drawl or anything like that. I can usually tell where people come from by how they talk—but I couldn't with Haskell."

Schwartz leaned back in his chair and wished that Mantusek would send out for more beer, anything that would help loosen the tightness in his chest.

"Did he ever have much to say? Did you ever talk to him when he picked up his mail at the desk?"

Miller thought about it for a moment.

"I don't think he ever got any mail. But he liked to talk, he was a friendly guy."

"Did he ever mention a family or friends or relatives?"

Another stream of blue smoke while Miller pondered.

"No, I don't think so. Not that I can remember."

Schwartz let his breath out slowly.

"What kind of an impression did Haskell give you, what kind of a man would you say he was?"

Miller frowned and stared at the smoke spiraling up from his cigarette.

Across the alley somebody was listening to a butter-mouthed disk jockey with a taste for Dixie jazz.

"No definite impression, actually. Just that he was a kind of a . . . lonely guy."

"Craig, Harry Craig. I . . . got a position at the Embassy."

He was skinny, about nineteen, with rounded shoulders and an almost invisible blond mustache. The sideburns that went with it were long and clipped sharply at the ends; his hair was combed around in back so it looked like the rear end of a duck. Schwartz figured him for a tough guy at another time and another place. But right now he was scared.

"What kind of work do you do at the Embassy, Harry?"

The thin hands nervously worked at each other.

"I'm a . . . assistant to the Maintenance Engineer."

"What else do you do besides help the janitor?"

Harry managed a smile. "Sometimes I help with the luggage, sometimes I run errands for the steadies."

"Did you know Haskell?"

Harry's voice grew cautious. "Yeah, I knew him."

"Helped him with his luggage when he signed in, maybe?"

"He didn't have any luggage."

"Rather unusual for a guest to sign in with no luggage, wasn't it?"

The skinny shoulders in the sports shirt shrugged.

"You got the money, the luggage doesn't matter."

"Ever run any errands for Haskell?"

Harry swatted at a fly buzzing around his head and hit the light bulb by mistake. The bulb swung around in crazy arcs, the shadows dancing dizzily around the concrete walls. Schwartz asked the question again.

"No, I never had much to do with the guy."

"Anybody ever come to see him? Any women?"

Harry moistened his lips with his tongue. "I wouldn't know anything about that."

Schwartz looked at him steadily. "If anything like that was going on at the Embassy, you'd know it, wouldn't you?"

Harry hesitated and Mantusek cut in from the shadows. "We're only asking questions, kid, we're not trying to pin anything on anybody."

Harry decided to co-operate. "No, he never had any women visiting him that I knew about."

"What was Haskell like?"

Harry ran a nervous hand through his hair. "Not a bad guy. Talked a lot but he wasn't loud. Odd guy, in a way. I remember once he wanted me to do something for him and you know what it was?"

"I thought you said you never ran errands for him?"

Harry leaned forward eagerly,

brushing aside the question. "Only this once: He wanted me to get him a pitcher of water."

Schwartz looked puzzled. "Water?"

"Yeah—I told you he was kinda odd. He's got a kitchen and everything and all he has to do is turn on the tap but he sends me all the way down to the hotel kitchen for a pitcher of water."

"Any idea why?"

Harry shrugged. "Search me. I asked him if he needed a plumber but he said no. He got a big bang out of it."

"Did he ever do anything else that struck you as odd?"

"Yeah, once he complained about the heat in his apartment."

"Lots of people do."

Harry shook his head. "You don't get me. He was complaining because he had too much."

Schwartz tried to make something out of it, then went back to the time when the boy had run the errand for Haskell.

"Big tipper?"

An expression of disgust flickered over Harry's face. "Tightest guy with a quarter I ever saw." He paused. "He was kind of funny about it."

"How do you mean?"

"It wasn't so much as if he were tight, it was more like he had never heard of tipping before."

Like he had never heard of it. Schwartz felt like somebody had just dropped an ice cube down his back.

"Haskell the friendly type, or kind of standoffish?"

"Oh, he was friendly all right but like I say, I never had much to do with him. The management doesn't like us to chin with the guests anyways. Besides—" His voice trailed off.

"Besides what?"

Harry frowned. "Any guy that asks you to bring him a pitcher of water when he's got the pipes right in his own kitchen, that kind of a guy you don't want to get next to." He sensed that Schwartz was done questioning and got up to go.

"What was your over-all impression, Harry?"

Harry fumbled with his hat a minute, thinking it over.

"I'd say he was the kinda guy that somebody ought to fix up. You know—the lonely type."

Schwartz guessed that the Hoffmans had intended to do the town that evening. Bryan Hoffman was middle-aged, balding, and had the type of portly build that didn't look good in evening clothes. His face was flushed and his breathing heavy; insurance statistics gave him five more years before his heart would give out.

His wife was younger—much younger. She was a honey blonde and the low-cut gown and mink wrap looked good on her. There was a touch of the professional to her make-up and Schwartz was willing to bet that she had been in one of the shows

around the Loop seven years before, at the tag end of the war when the only thing you could buy was entertainment and the night clubs were raking it in. Hoffman had probably been playing around and discovered too late that she was playing for keeps.

Hoffman lowered himself gently into a chair, as if he were something fragile that would break easily. "We'll be glad to co-operate, naturally, always glad to co-operate with the police, Mr. Schwartz. Anything you want to ask, you just go right ahead. Anything at all."

Mrs. Hoffman sat down next to her husband. She was a little tense, unconsciously twisting the white cotton gloves she held in her hands.

"How long have you been living at the Embassy apartments?" Schwartz addressed his question to the woman.

Her voice was low and vibrant. "Ever since Bryan and I were married seven years ago—after the Purple Frolics closed."

Schwartz liked the way she said it, frank and honest.

"Then you've known Norman Haskell ever since he moved into the Embassy?"

"That's right. He lived right next door."

"Can you give me your impression of him?"

She started to answer but her husband beat her to the starting line, edging forward in his chair. "He aroused my suspicions at once, Mr. Schwartz. I had a feeling something was wrong even then. He had no job, no visible means of support, but he lived like a king—like a king. I had a hunch he was a criminal, even then."

"So far as we know, he wasn't, Mr. Hoffman. And he seems to have paid all his bills. Maybe he had money left to him."

Hoffman reddened and Schwartz took it that he disapproved of young men who had money but who apparently didn't have to work for it.

"Even if he did, he was still an object of suspicion, Mr. Schwartz. An unusual man with unusual tastes and habits. Unusual, too unusual."

Schwartz felt the ice crawl down his spine again.

"Just how do you mean that?"

Mrs. Hoffman answered for her husband.

"Bryan means that Mr. Haskell was a character."

Mr. Hoffman started to add something to that, then subsided.

"Care to enlarge on that?"

Her voice was hesitant. "His conversation was—rather odd. He seemed to like to talk about things that hardly anybody in their right mind talks about. Like how many people there were in the city and how tall the buildings were and how terrible traffic accidents are." She paused. "They are, of course, but you don't talk about them like they had never happened before."

Mantusek interrupted. "You're at home most of the time while your husband's working, that right, Mrs. Hoffman?"

"Why, yes, I am."

"Was Haskell ever friendly to you, Mrs. Hoffman?" Mantusek asked bluntly.

Hoffman was on his feet. "Now see here, captain! I don't—"

His wife caught him by the arm and pulled him gently back to the chair. She didn't seem offended. "He was friendly enough, captain," she said evenly, "but not the way you mean."

"Did he ever invite the two of you to dinner?" Schwartz asked suddenly.

She looked surprised. "As a matter of fact, he did."

"Did you accept?"

"Well, he lived right next door. It would have been hard to refuse, even though he was a complete stranger."

They had lived next door to each other for a couple of months but they were still complete strangers. That was the city all over, Schwartz thought. He idly wondered if Haskell had ever understood that.

Hoffman suddenly came to life again. "It was the strangest meal you ever saw, lieutenant. Strangest meal I ever ate in my life."

Schwartz felt the tightness in his chest again. "I don't understand."

"Bryan means the food," Hoffman's wife interrupted. "It was terrible. Really—even after making allowances. It was like nothing I've ever eaten before and I've eaten in almost every so-called restaurant in Chicago. Most of the food was dry and a little salty." A vague amusement crept into her eyes. "The part that I really couldn't get over was when he served drinks. You know, you expect the customary cocktails before dinner. Haskell served drinks but they were just plain water." She laughed. "Really—water. Bryan was indignant but I thought it was very funny."

Schwartz was sweating and not all of it was because of the heat.

"Could you tell us anything else about Haskell that struck you as being unusual?"

She bit her lower lip lightly in thought.

"Well . . . yes, I can. I remember when he first moved in I got the oddest feeling that he had been an explorer or something. I remember reading one time about an explorer who had almost starved to death in the Arctic and when he came home he stuffed his whole house with canned goods so he wouldn't have to worry about starving again. That's what I thought when I paid Mr. Haskell a courtesy call just after he moved in—that he had been an explorer, maybe in the desert. You see, he had filled the bathtub and the sink and every container he could get his hands on with water."

"Did he ever mention why?"

She laughed. "He seemed to think

it was the thing to do. I just thought that he was a very odd young man."

"Can you tell us anything more about him?"

She shook her head. "Actually, outside of the dinner, we had very little to do with him."

"What kind of an impression did he leave, Mrs. Hoffman?"

She began to draw on the light cotton gloves. "He struck me as being a very lonely man." She smiled. "Of course, a man like that would be."

The sweat had turned cold on Schwartz's shirt and he felt clammy. A rainstorm was blowing up in the east and some of the cooler air poured in through the alley window.

Mantusek was back at his puzzle. "If the fingerprint boys turn in a negative report, get some men to bundle up Haskell's clothes and clean out his apartment. The county'll have to stand the burial."

Schwartz fumbled with his cigarettes. He had trouble holding the lighter so the flame didn't shake. "What's your opinion, Manny?"

"It's one of these screwball cases. Probably some DP with money."

"They said he spoke good English."

Mantusek shrugged. "Some foreigners speak the language a lot better'n I do. Besides, you live in Chicago long enough and you wouldn't know good English from bad anyways." He yawned. "Where do you think he was from?"

"I don't know," Schwartz said nervously. "I haven't any idea. But I'd bet it was some country where water was scarce—damn scarce—and where the people were used to colder weather. And I bet it was . . . a long ways from here."

Mantusek looked at him sharply. "You got your own ideas about this, don't you?"

Schwartz's voice was hesitant. "What if you had to bail out over a neutral country during a war, Manny, and you didn't want to be interned? You could get along if nobody saw you drop and if you knew the language and had forged identification papers and money enough to last you. You probably wouldn't get a job because you'd be ignorant of local industry and people might get suspicious. But you'd get lonely, you'd want to talk to people—"

"What's that got to do with Haskell? You think he's a Russki or something?"

Schwartz shook his head. "No." His voice sounded strained. "We'll know more about it when Doc calls, after he's done an autopsy. Then maybe we'll have to call Washington."

Mantusek crumpled up his crossword puzzle and threw it in the wastepaper basket. "You been running scared, Abe. You been running scared ever since you came in this evening."

"Maybe in half an hour we'll all be running scared, Manny." He took a deep breath. "You and me and the

Federal boys and maybe even the army and the air force."

"What's eating you, Abe? What's the story?"

Schwartz walked over to the window and looked out at the small section of night sky that showed between the apartment buildings across the alley. "I think Haskell bailed out, Manny. I think he was in a war, a war we don't know anything about." He waved at the star-streaked sky. "A war that's fought some place out there, that doesn't even come close to our own planet."

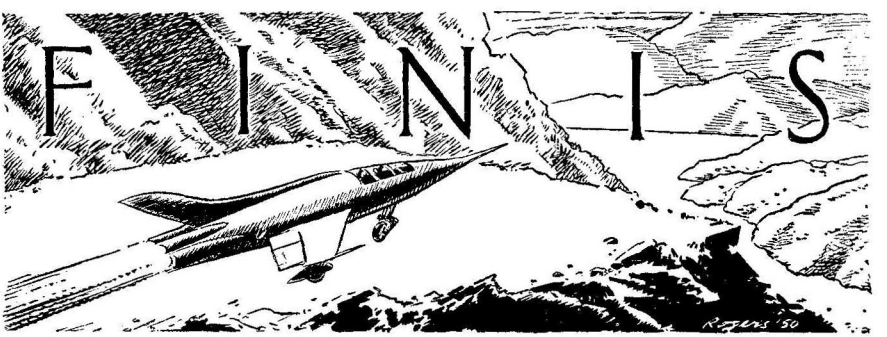
He turned away from the window. "I'm scared, Manny. I remember looking up at the evening sky when I was a kid and feeling lonely because I thought we were the only people in all Creation, just those of us on our little Earth. Now I'm scared because I know we're not. Out There it's filled with different races fighting their wars and going about their business and not paying any attention to us, maybe because we're not important enough to pay any attention to. Or maybe we're neutral territory." His voice shook. "Or maybe they just haven't gotten around to us yet."

"You're off your trolley, Schwartz," Mantusek said harshly.

Schwartz's eyes showed too much white. "You think so? Wait until Doc calls. When we pulled Haskell out of the tub I noticed the bump on the back of his head right away. He had been bleeding and his hair was a little matted with blood where the skin was broken. The water had washed most of the blood off so Doc didn't notice. But I did. His blood wasn't red, Manny." Schwartz sounded sick. "It was blue. The brightest blue I ever saw—"

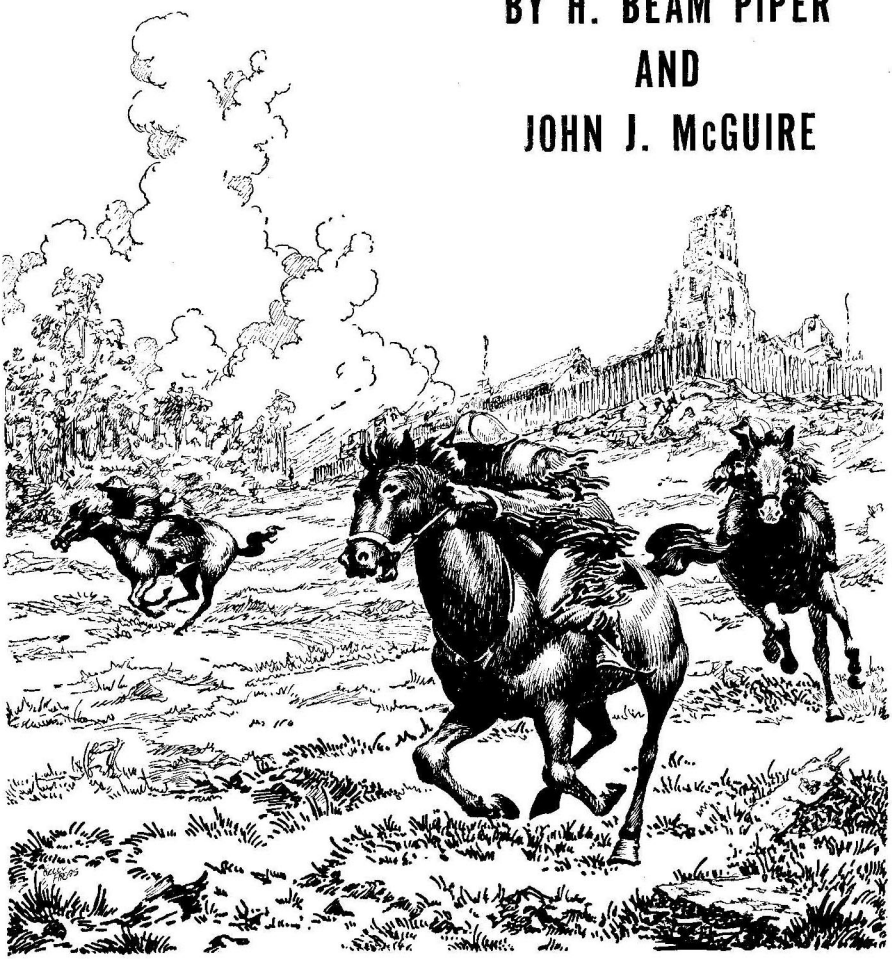
Mantusek opened his mouth to say something, then thought better of it and fell silent.

They waited for the phone to ring.



THE RETURN

BY H. BEAM PIPER AND JOHN J. McGUIRE



***The isolated** little group they found were doing fine—*

but their religion was most strange—and yet quite logical!

Illustrated by Kelly Freas

Altamont cast a quick, routine, glance at the instrument panels and then looked down through the transparent nose of the helicopter at the yellow-brown river five hundred feet below. Next he scraped the last morsel from his plate and ate it.

"What did you make this out of, Jim?" he asked. "I hope you kept notes, while you were concocting it. It's good."

"The two smoked pork chops left over from yesterday evening," Loudons said, "and that bowl of rice that's been taking up space in the refrigerator the last couple of days together with a little egg powder, and some milk. I ground the chops up and mixed them with the rice and the other stuff. Then added some bacon, to make grease to fry it in."

Altamont chuckled. That was Loudons, all right; he could take a few left-overs, mess them together, pop them in the skillet, and have a meal that would turn the chef back at the Fort green with envy. He filled his cup and offered the pot.

"Caffchoc?" he asked.

Loudons held his cup out to be filled, blew on it, sipped, and then hunted on the ledge under the desk for the butt of the cigar he had half-smoked the evening before.

"Did you ever drink coffee, Monty?" the socio-psychologist asked, getting the cigar drawing to his taste.

"Coffee? No. I've read about it, of course. We'll have to organize an expedition to Brazil, some time, to get seeds, and try raising some."

Loudons blew a smoke ring toward the rear of the cabin.

"A much overrated beverage," he replied. "We found some, once, when I was on that expedition into Idaho, in what must have been the stockroom of a hotel. Vacuum-packed in moisture-proof containers, and free from radio-activity. It wasn't nearly as good as caffchoc. But then, I suppose, a pre-bustup coffee drinker couldn't stomach this stuff we're drinking." He looked forward, up the river they were following. "Get anything on the radio?" he asked. "I noticed you took us up to about ten thousand, while I was shaving."

Altamont got out his pipe and tobacco pouch, filling the former slowly and carefully.

"Not a whisper. I tried Colony Three, in the Ozarks, and I tried to call in that tribe of workers in Louisiana; I couldn't get either."

"Maybe if we tried to get a little more power on the set—"

That was Loudons, too, Altamont

thought. There wasn't a better man at the Fort, when it came to dealing with people, but confront him with a problem about things, and he was lost. That was one of the reasons why he and the stocky, phlegmatic social scientist made such a good team, he thought. As far as he, himself, was concerned, people were just a mysterious, exasperatingly unpredictable, order of things which were subject to no known natural laws. That was about the way Loudons thought of things; he couldn't psychoanalyze them.

He gestured with his pipe toward the nuclear-electric conversion unit, between the control-cabin and the living quarters in the rear of the box-car-sized helicopter.

"We have enough power back there to keep this windmill in the air twenty-four hours a day, three hundred and sixty-five days a year, for the next fifteen years," he said. "We just don't have enough radio. If I'd step up the power on this set any more, it'd burn out before I could say, 'Altamont calling Fort Ridgeway.' "

"How far are we from Pittsburgh, now?" Loudons wanted to know.

Altamont looked across the cabin at the big map of the United States, with its red and green and blue and yellow patchwork of vanished political divisions, and the transparent overlay on which they had plotted their course. The red line started at Fort Ridgeway, in what had once been Arizona. It angled east by a little north, to Colony Three, in northern Arkansas; then sharply northeast to St. Louis and its lifeless ruins; then Chicago and Gary, where little bands of Stone Age reversions stalked and fought and ate each other; Detroit, where things that had completely forgotten that they were human emerged from their burrows only at night; Cleveland, where a couple of cobalt bombs must have landed in the lake and drenched everything with radioactivity that still lingered after two centuries; Akron, where vegetation was only beginning to break through the glassy slag; Cincinnati, where they had last stopped—

"How's the leg, this morning, Jim?" he asked.

"Little stiff. Doesn't hurt much, though."

"Why, we're about fifty miles, as we follow the river, and that's relatively straight." He looked down through the transparent nose of the 'copter at a town, now choked with trees that grew among tumbled walls. "I think that's Aliquippa."

Loudons looked and shrugged, then looked again and pointed.

"There's a bear. Just ducked into that church or movie theater or whatever. I wonder what he thinks we are."

Altamont puffed slowly at his pipe. "I wonder if we're going to find anything at all in Pittsburgh."

"You mean people, as distinct from those biped beasts we've found so far? I doubt it," Loudons replied, finishing

his caffchoc and wiping his mustache on the back of his hand. "I think the whole eastern half of the country is nothing but forest like this, and the highest type of life is just about three cuts below *Homo Neanderthalensis*, almost impossible to contact, and even more impossible to educate."

"I wasn't thinking about that; I've just about given up hope of finding anybody or even a reasonably high level of barbarism," Altamont said. "I was thinking about that cache of microfilmed books that was buried at the Carnegie Library."

"If it was buried," Loudons qualified. "All we have is that article in that two-century-old copy of *Time* about how the people at the library had constructed the crypt and were beginning the microfilming. We don't know if they ever had a chance to get it finished, before the rockets started landing."

They passed over a dam of flotsam that had banked up at a wrecked bridge and accumulated enough mass to resist the periodic floods that had kept the river usually clear. Three human figures fled across a sand-flat at one end of it and disappeared into the woods; two of them carried spears tipped with something that sparkled in the sunlight, probably shards of glass.

"You know, Monty, I get nightmares, sometimes, about what things must be like in Europe," Loudons said.

Five or six wild cows went crashing through the brush below. Altamont nodded when he saw them.

"Maybe tomorrow, we'll let down and shoot a cow," he said. "I was looking in the freezer-locker; the fresh meat's getting a little low. Or a wild pig, if we find a good stand of oak trees. I could enjoy what you'd do with some acorn-fed pork. Finished?" he asked Loudons. "Take over, then; I'll go back and wash the dishes."

They rose, and Loudons, favoring his left leg, moved over to the seat at the controls. Altamont gathered up the two cups, the stainless-steel dishes, and the knives and forks and spoons, going up the steps over the shielded converter and ducking his head to avoid the seat in the forward top machine-gun turret. He washed and dried the dishes, noting with satisfaction that the gauge of the water tank was still reasonably high, and glanced out one of the windows. Loudons was taking the big helicopter upstairs, for a better view.

Now and then, among the trees, there would be a glint of glassy slag, usually in a fairly small circle. That was to be expected; beside the three or four H-bombs that had fallen on the Pittsburgh area, mentioned in the transcripts of the last news to reach the Fort from outside, the whole district had been pelted, more or less at random, with fission bombs. West of the confluence of the Allegheny and Monongahela, it would probably be

worse than this.

"Can you see Pittsburgh yet, Jim?" he called out.

"Yes; it's a mess! Worse than Gary; worse than Akron, even. *Monty!* Come here! I think I have something!"

Picking up the pipe he had laid down, Altamont hurried forward, dodging his six-foot length under the gun turret and swinging down from the walkway over the converter.

"What is it?" he asked.

"Smoke. A lot of smoke, twenty or thirty fires, at the very least." Loudons had shifted from *Forward* to *Hover*, and was peering through a pair of binoculars. "See that island, the long one? Across the river from it, on the north side, toward this end. Yes, by Einstein! And I can see cleared ground, and what I think are houses, inside a stockade—"

Murray Hughes walked around the corner of the cabin, into the morning sunlight, lacing his trousers, with his hunting shirt thrown over his bare shoulders, and found, without much surprise, that his father had also slept late. Verner Hughes was just beginning to shave. Inside the kitchen, his mother and the girls were clattering pots and skillets; his younger brother, Hector, was noisily chopping wood. Going through the door, he filled another of the light-metal basins with hot water, found his razor, and went outside again, setting the basin on the bench.

Most of the ware in the Hughes cabin was of light-metal; Murray and his father had mined it in the dead city up the river, from a place where it had floated to the top of a puddle of slag, back when the city had been blasted, at the end of the Old Times. It had been hard work, but the stuff had been easy to carry down to where they had hidden their boat, and, for once, they'd had no trouble with the Scowrers. Too bad they couldn't say as much for yesterday's hunting trip!

As he rubbed lather into the stubble on his face, he cursed with irritation. That had been a bad-luck hunt, all around. They'd gone out before dawn, hunting into the hills to the north, they'd spent all day at it, and shot one small wild pig. Lucky it was small, at that. They'd have had to abandon a full-grown one, after the Scowrers began hunting them. Six of them, as big a band as he'd ever seen together at one time, and they'd gotten between them and the stockade and forced them to circle miles out of their way. His father had shot one, and he'd had to leave his hatchet sticking in the skull of another, when his rifle had misfired.

That meant a trip to the gunsmith's, for a new hatchet and to have the mainspring of the rifle replaced. Nobody could afford to have a rifle that couldn't be trusted, least of all a hunter and prospector. And he'd had words with Alex Barrett, the gunsmith, just the other day. Not that Barrett

wouldn't be more than glad to do business with him, once he saw that hard tool-steel he'd dug out of that place down the river. Hardest steel he'd ever found, and hadn't been atom-spoiled, either.

He cleaned, wiped and stropped his razor and put it back in the case; he threw out the wash-water on the compost-pile, and went into the cabin, putting on his shirt and his belt, and passed on through to the front porch, where his father was already eating at the table. The people of the Toon liked to eat in the open; it was something they'd always done, just as they'd always liked to eat together in the evenings.

He sweetened his mug of chicory with a lump of maple sugar and began to sip it before he sat down, standing with one foot on the bench and looking down across the parade ground, past the Aitch-Cue House, toward the river and the wall.

"If you're coming around to Alex's way of thinking—and mine—it won't hurt you to admit it, son," his father said.

He turned, looking at his father with the beginning of anger, and then grinned. The elders were constantly keeping the young men alert with these tests. He checked back over his actions since he had come out onto the porch.

To the table, sugar in his chicory, one foot on the bench, which had reminded him again of the absence of the hatchet from his belt and brought an automatic frown. Then the glance toward the gunsmith's shop, and across the parade ground, at the houses into which so much labor had gone; the wall that had been built from rubble and topped with pointed stakes; the white slabs of marble from the ruined building that marked the graves of the First Tenant and the men of the Old Toon. He *had* thought, in that moment, that maybe his father and Alex Barrett and Reader Rawson and Tenant Mycroft Jones and the others were right — there were too many things here that could not be moved along with them, if they decided to move.

It would be false modesty, refusal to see things as they were, not to admit that he was the leader of the younger men, and the boys of the Irregulars. And last winter, the usual theological arguments about the proper chronological order of the Sacred Books and the true nature of the Risen One had been replaced by a violent controversy when Sholto Jiminez and Birdy Edwards had reopened the old question of the advisability of moving the Toon and settling elsewhere. He'd been in favor of the idea, himself, but, for the last month or so, he had begun to doubt the wisdom of it. It was probably reluctance to admit this to himself that had brought on the strained feelings between himself and his old friend the gunsmith.

"I'll have to drill the Irregulars, today," he said. "Birdy Edwards has

been drilling them, while we've been hunting. But I'll go up and see Alex about a new hatchet and fixing my rifle. I'll have a talk with him."

He stepped forward to the edge of the porch, still munching on a honey-dipped piece of corn bread, and glanced up at the sky. That was a queer bird; he'd never seen a bird with a wing action like that. Then he realized that the object was not a bird at all.

His father was staring at it, too.

"Murray! That's . . . that's like the old stories from the time of the wars!"

But Murray was already racing across the parade ground toward the Aitch-Cue House, where the big iron ring hung by its chain from a gallows-like post, with the hammer beside it.

The stockaded village grew larger, details became plainer, as the helicopter came slanting down and began spiraling around it. It was a fairly big place, some forty or fifty acres in a rough parallelogram, surrounded by a wall of varicolored stone and brick and concrete rubble from old ruins, topped with a palisade of pointed poles. There was a small jetty projecting out into the river, to which six or eight boats of different sorts were tied; a gate opened onto this from the wall. Inside the stockade, there were close to a hundred buildings, ranging from small cabins to a structure with a belfry, which seemed to have been a church, partly ruined in the war of two centuries ago and later rebuilt. A stream came down from the woods, across the cultivated land around the fortified village; there was a rough flume which carried the water from a dam close to the edge of the forest and provided a fall to turn a mill wheel.

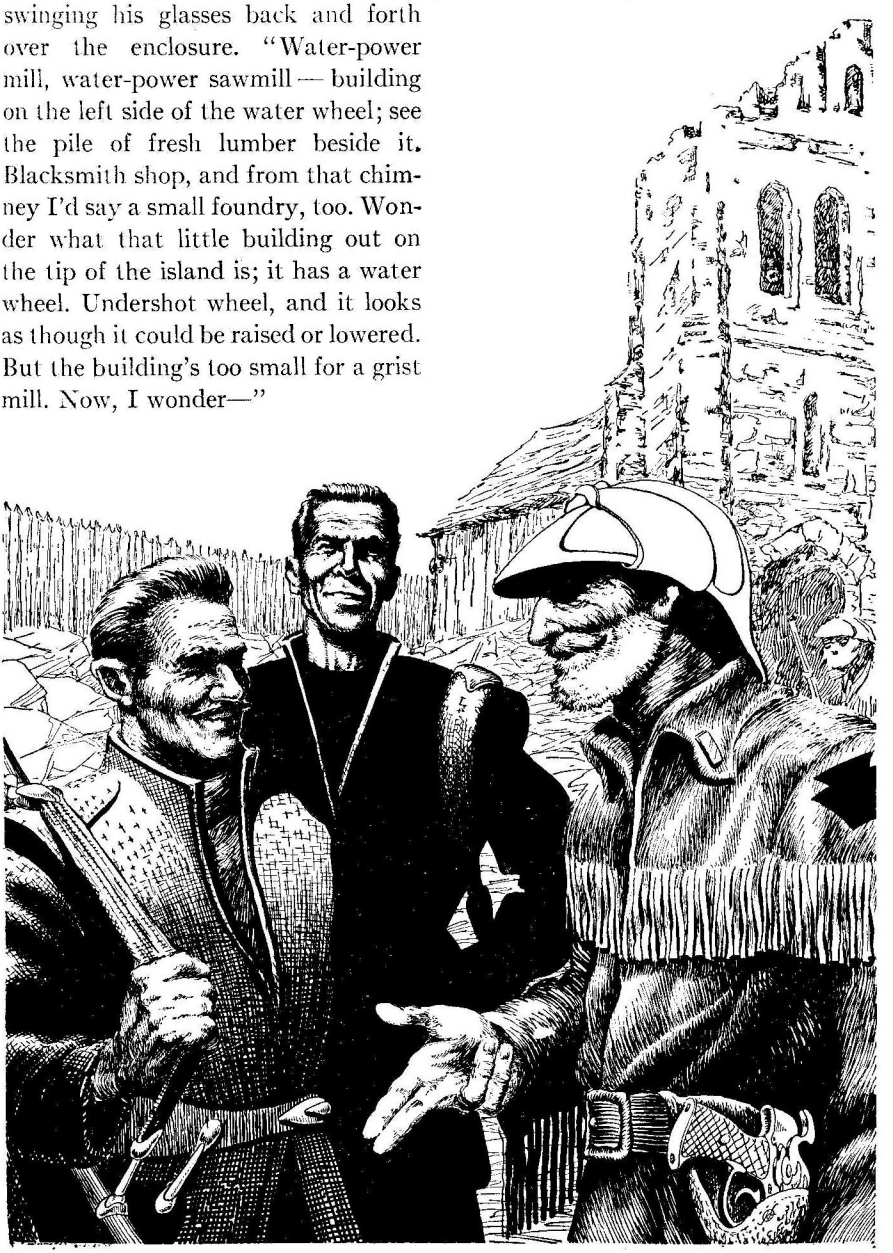
"Look; strip-farming," Loudons pointed. "See the alternate strips of grass and plowed ground. Those people understand soil conservation. They have horses, too."

As he spoke, three riders left the village at a gallop, through a gate on the far side. They separated, and the people in the fields, who had all started for the village, turned and began hurrying toward the woods. Two of the riders headed for a pasture in which cattle had been grazing, and started herding them, also, into the woods. For a while, there was a scurrying of little figures in the village below, and then not a moving thing was in sight.

"There's good organization," Loudons said. "Everybody seems to know what to do, and how to get it done promptly. And look how neat the whole place is. Policed up. I'll bet anything we'll find that they have a military organization, or a military tradition at least. We'll have to find out; you can't understand a people till you understand their background and their social organization."

"Humph. Let me have a look at their artifacts; that'll tell what kind of people they are," Altamont said,

swinging his glasses back and forth over the enclosure. "Water-power mill, water-power sawmill — building on the left side of the water wheel; see the pile of fresh lumber beside it. Blacksmith shop, and from that chimney I'd say a small foundry, too. Wonder what that little building out on the tip of the island is; it has a water wheel. Undershot wheel, and it looks as though it could be raised or lowered. But the building's too small for a grist mill. Now, I wonder—"



"Monty, I think we ought to land right in the middle of the enclosure, on that open plaza thing, in front of that building that looks like a reconditioned church. That's probably the Royal Palace, or the Pentagon, or the Kremlin, or whatever."

Altamont started to object, paused, and then nodded. "I think you're right, Jim. From the way they scattered, and got their livestock into the woods, they probably expect us to bomb them. We have to get inside; that's the quickest way to do it." He thought for a moment. "We'd better be armed, when we go out. Pistols, auto-carbines, and a few of those concussion-grenades in case we have to break up a concerted attack. I'll get them."

The plaza and the houses and cabins around it, and the two-hundred-year-old church, were silent and, apparently, lifeless as they set the helicopter down. Once Loudons caught a movement inside the door of a house, and saw a metallic glint. Altamont pointed up at the belfry.

"There's a gun up there," he said. "Looks like about a four-pounder. Brass. I knew that smith-shop was also a foundry. See that little curl of smoke? That's the gunner's slow-match. I'd thought maybe that thing on the island was a powder mill. That would be where they'd put it. Probably extract their niter from the dung of their horses and cows. Sulfur probably from coal-mine drainage. Jim, this is really something!"

"I hope they don't cut loose on us with that thing," Loudons said, looking apprehensively at the brass-rimmed black muzzle that was covering them from the belfry. "I wonder if we ought to— Oh-oh, here they come!"

Three or four young men stepped out of the wide door of the old church. They wore fringed buckskin trousers and buckskin shirts and odd caps of deerskin with visors to shade their eyes and similar beaks behind to protect the neck. They had powder horns and bullet pouches slung over their shoulders, and long rifles in their hands. They stepped aside as soon as they were out; carefully avoiding any gesture of menace, they stood watching the helicopter which had landed among them.

Three other men followed them out; they, too, wore buckskins, and the odd double-visored caps. One had a close-cropped white beard, and on the shoulders of his buckskin shirt he wore the single silver bars of a first lieutenant of the vanished United States Army. He had a pistol on his belt; it had the saw-handle grip of an automatic, but it was a flintlock, as were the rifles of the young men who stood watchfully on either side of the two middle-aged men who accompanied him. The whole party advanced toward the helicopter.

"All right; come on, Monty." Loudons opened the door and let down

the steps. Picking up an auto-carbine, he slung it and stepped out of the helicopter, Altamont behind him. They advanced to meet the party from the old church, halting when they were about twenty feet apart.

"I must apologize, lieutenant, for dropping in on you so unceremoniously." He stopped, wondering if the man with the white beard understood a word of what he was saying.

"The natural way to come in, when you travel in the air," the old man replied. "At least, you came in openly. I can promise you a better reception than you got at that city to the west of us a couple of days ago."

"Now how did you know we'd had trouble at Cincinnati day-before-yesterday?" Loudons demanded.

The old man's eyes sparkled with childlike pleasure. "That surprises you, my dear sir? In a moment, I daresay you'll be amazed at the simplicity of it. You have a nasty rip in the left leg of your trousers, and the cloth around it is stained with blood. Through the rip, I perceive a bandage. Obviously, you have suffered a recent wound. I further observe that the side of your flying machine bears recent scratches, as though from the spears or throwing-hatchets of the Scowrers. Evidently they attacked you as you were leaving it; it is fortunate that these cannibal devils are too stupid and too anxious for human flesh to exercise patience."

"Well, that explains how you knew we'd been recently attacked," Loudons told him. "But how did you guess that it had been to the west of here, in a ruined city?"

"I never guess," the oldster with the silver bar and the keystone-shaped red patch on his left shoulder replied. "It is a shocking habit—destructive to the logical faculty. What seems strange to you is only so because you do not follow my train of thought. For example, the wheels and their framework under your flying machine are splashed with mud which seems to be predominantly brick-dust, mixed with plaster. Obviously, you landed recently in a dead city, either during or after a rain. There was a rain here yesterday evening, the wind being from the west. Obviously, you followed behind the rain as it came up the river. And now that I look at your boots, I see traces of the same sort of mud, around the soles and in front of the heels. But this is heartless of us, keeping you standing here on a wounded leg, sir. Come in, and let our medic look at it."

"Well, thank you, lieutenant," Loudons replied. "But don't bother your medic; I've attended to the wound myself, and it wasn't serious to begin with."

"You are a doctor?" the white-bearded man asked.

"Of sorts. A sort of general scientist. My name is Loudons. My friend, Mr. Altamont, here, is a scientist, also."

There was an immediate reaction;

all three of the elders of the village, and the young riflemen who had accompanied them, exchanged glances of surprise. Loudons dropped his hand to the grip of his slung auto-carbine, and Altamont sidled unobtrusively away from him, his hand moving as by accident toward the butt of his pistol. The same thought was in both men's minds, that these people might feel, as a heritage of the war of two centuries ago, a hostility to science and scientists. There was no hostility, however, in their manner as the old man advanced and held out his hand.

"I am Tenant Mycroft Jones, the Toon Leader here," he said. "This is Stamford Rawson, our Reader, and Verner Hughes, our Toon Sarge. This is his son, Murray Hughes, the Toon Sarge of the Irregulars. But come into the Aitch-Cue House, gentlemen. We have much to talk about."

By this time, the villagers had begun to emerge from the log cabins and rubble-walled houses around the plaza and the old church. Some of them, mostly young men, were carrying rifles, but the majority of them were unarmed. About half of them were women, in short deerskin or homespun dresses; there were a number of children, the younger ones almost completely naked.

"Sarge," the old man told one of the youths, "post a guard over this flying machine; don't let anybody meddle with it. And have all the noncoms and techs report here, on the double." He turned and shouted up at the truncated steeple: "Atherton, sound 'All Clear!'"

A horn, up in the belfry, began blowing, to advise the people who had run from the fields into the woods that there was no danger.

They went through the open doorway of the old stone church, and entered the big room inside. The building had evidently been gutted by fire, two centuries before, and portions of the wall had been restored. Now there was a rough plank floor, and a plank ceiling at about twelve feet; the room was apparently used as a community center. There were a number of benches and chairs, all very neatly made, and along one wall, out of the way, ten or fifteen long tables had been stacked, the tops in a pile and the trestles on them. The walls were decorated with trophies of weapons—a number of old M-12 rifles and M-16 submachine guns, all in good clean condition, a light machine rifle, two bazookas. Among them were stone- and metal-tipped spears and crude hatchets and knives and clubs, the work of the wild men of the woods. A stairway led to the second floor, and it was up this that the man who bore the title of Toon Leader conducted them, to a small room furnished with a long table, a number of chairs, and several big wooden chests bound with iron.

"Sit down, gentlemen," the Toon Leader invited, going to a cupboard

and producing a large bottle stopped with a corncob and a number of small cups. "It's a little early in the day," he said, "but this is a very special occasion. You smoke a pipe, I take it?" he asked Altamont. "Then try some of this; of our own growth and curing." He extended a doeskin moccasin, which seemed to be the tobacco-container.

Altamont looked at the thing dubiously, then filled his pipe from it. The oldster drew his pistol, pushed a little wooden plug into the vent, added some tow to the priming, and, aiming at the wall, snapped it. Evidently, at times the formality of plugging the vent had been overlooked; there were a number of holes in the wall there. This time, however, the pistol didn't go off. He shook out the smoldering tow, blew it into flame, and lit a candle from it, offering the light to Altamont. Loudons got out a cigar and lit it from the candle; the others filled and lighted pipes. The Toon Leader reprimed his pistol, then holstered it, took off his belt and laid it aside, an example the others followed.

They drank ceremoniously, and then seated themselves at the table. As they did, two more men came into the room; they were introduced as Alexander Barrett, the gunsmith, and Stanley Markovitch, the distiller.

"You come, then, from the west?" the Toon Leader began by asking.

"Are you from Utah?" the gunsmith interrupted, suspiciously.

"Why, no; we're from Arizona. A place called Fort Ridgeway," Loudons said.

The others nodded, in the manner of people who wish to conceal ignorance; it was obvious that none of them had ever heard of Fort Ridgeway, or Arizona either.

"We've been in what used to be Utah," Altamont said. "There's nobody there but a few Indians, and a few whites who are even less civilized."

"You say you come from a fort? Then the wars aren't over, yet?" Sarge Hughes asked.

"The wars have been over for a long time. You know how terrible they were. You know how few in all the country were left alive," Loudons said.

"None that we know of, beside ourselves and the Scowrers until you came," the Toon Leader said.

"We have found only a few small groups, in the whole country, who have managed to save anything of the Old Times. Most of them lived in little villages and cultivated land. A few had horses, or cows. None, that we have ever found before, made guns and powder for themselves. But they remembered that they were men, and did not eat one another. Whenever we find a group of people like this, we try to persuade them to let us help them."

"Why?" the Toon Leader asked. "Why do you do this for people you've never met before? What do you want from them—from us—in

return for your help?" He was speaking to Altamont, rather than to Loudons; it seemed obvious that he believed Altamont to be the leader and Loudons the subordinate.

"Because we're trying to bring back the best things of the Old Times," Altamont told him. "Look; you've had troubles, here. So have we, many times. Years when the crops failed; years of storms, or floods; troubles with these beast-men in the woods. And you were alone, as we were, with no one to help. We want to put all men who are still men in touch with one another, so that they can help each other in trouble, and work together. If this isn't done soon, everything which makes men different from beasts will soon be no more."

"He's right. One of us, alone, is helpless," the Reader said. "It is only in the Toon that there is strength. He wants to organize a Toon of all Toons."

"That's about it. We are beginning to make helicopters like the one Loudons and I came here in. We'll furnish your community with one or more of them. We can give you a radio, so that you can communicate with other communities. We can give you rifles and machine guns and ammunition, to fight the . . . the Scowrers, did you call them? And we can give you atomic engines, so that you can build ma-machines for yourselves."

"Some of our people—Alex Barrett, here, the gunsmith, and Stan Markovitch, the distiller, and Harrison Grant, the iron worker—get their living by making things. How'd they make out, after your machines came in here?" Verner Hughes asked.

"We've thought of that; we had that problem with other groups we've helped," Loudons said. "In some communities, everybody owns everything in common; we don't have much of a problem, there. Is that the way you do it, here?"

"Well, no. If a man makes a thing, or digs it out of the ruins, or catches it in the wooods, it's his."

"Then we'll work out some way. Give the machines to the people who are already in a trade, or something like that. We'll have to talk it over with you and with the people who'd be concerned."

"How is it you took so long finding us," Alex Barrett asked. "It's been two hundred or so years since the Wars."

"Alex! You see but you do not observe!" The Toon Leader rebuked. "These people have their flying machines, which are highly complicated mechanisms. They would have to make tools and machines to make them, and tools and machines to make those tools and machines. They would have to find materials, often going far in search of them. The marvel is not that they took so long, but that they did it so quickly."

"That's right," Altamont said.

"Originally, Fort Ridgeway was a military research and development center. As the country became disorganized, the Government set this project up, to develop ways of improvising power and transportation and communication methods and extracting raw materials. If they'd had a little more time, they might have saved the country. As it was, they were able to keep themselves alive and keep something like civilization going at the Fort, while the whole country was breaking apart around them. Then, when the rockets stopped falling, they started to rebuild. Fortunately, more than half the technicians at the Fort were women; there was no question of them dying out. But it's only been in the last twenty years that we've been able to make nuclear-electric engines, and this is the first time any of us have gotten east of the Mississippi."

"How did your group manage to survive?" Loudons said. "You call it the Toon; I suppose that's what the word platoon has become, with time. You were, originally, a military platoon?"

"*Pla*-toon!" the white-bearded man said. "Of all the unpardonable stupidity! Of course that was what it was. And the title, Tenant, was originally *lieu*-tenant; I know that, though we have all dropped the first part of the word. That should have led me, if I'd used my wits, to deduce platoon from toon.

"Yes, sir. We were originally a platoon of soldiers, two hundred years ago, at the time when the Wars ended. The Old Toon, and the First Tenant, were guarding pows, whatever they were. The pows were all killed by a big bomb, and the First Tenant, Lieutenant Gilbert Dunbar, took his . . . his platoon and started to march to Deecee, where the Government was, but there was no Government, any more. They fought with the people along the way. When they needed food, or ammunition, or animals to pull their wagons, they took them, and killed those who tried to prevent them. Other people joined the Toon, and when they found women whom they wanted, they took them. They did all sorts of things that would have been crimes if there had been any law, but since there was no law any longer, it was obvious that there could be no crime. The First Ten—Lieutenant—kept his men together, because he had The Books. Each evening, at the end of each day's march, he read to his men out of them.

"Finally, they came here. There had been a town here, but it had been burned and destroyed, and there were people camping in the ruins. Some of them fought and were killed; others came in and joined the platoon. At first, they built shelters around this building, and made this their fort. Then they cleared away the ruins, and built new houses. When the cartridges for the rifles began to get scarce, they began to make gunpowder, and new

rifles, like these we are using now, to shoot without cartridges. Lieutenant Dunbar did this out of his own knowledge, because there is nothing in The Books about making gunpowder; the guns in The Books are rifles and shotguns and revolvers and airguns; except for the airguns, which we haven't been able to make, these all shot cartridges. As with your people, we did not die out, because we had women. Neither did we increase greatly—too many died or were killed young. But several times we've had to tear down the wall and rebuild it, to make room inside it for more houses, and we've been clearing a little more land for fields each year. We still read and follow the teachings of The Books; we have made laws for ourselves out of them."

"And we are waiting here, for the Slain and Risen One," Tenant Jones added, looking at Altamont intently. "It is impossible that He will not, sooner or later, deduce the existence of this community. If He has not done so already."

"Well, sir," the Toon Leader changed the subject abruptly, "enough of this talk about the past. If I understand rightly, it is the future in which you gentlemen are interested." He pushed back the cuff of his hunting shirt and looked at an old and worn

wrist watch. "Eleven-hundred; we'll have lunch shortly. This afternoon, you will meet the other people of the Toon, and this evening, at eighteen-hundred, we'll have a mess together outdoors. Then, when we have everybody together, we can talk over your offer to help us, and decide what it is that you can give us that we can use."

"You spoke, a while ago, of what you could do for us, in return," Altamont said. "There's one thing you can do, no further away than tomorrow, if you're willing."

"And that is—?"

"In Pittsburgh, somewhere, there is an underground crypt, full of books. Not bound and printed books; spools of microfilm. You know what that is?"

The others shook their heads. Altamont continued:

"They are spools on which strips are wound, on which pictures have been taken of books, page by page. We can make other, larger pictures from them, big enough to be read—"

"Oh, photographs, which you enlarge. I understand that. You mean, you can make many copies of them?"

"That's right. And you shall have copies, as soon as we can take the originals back to Fort Ridgeway, where we have equipment for enlarging them. But while we have information which will help us to find the crypt where the books are, we will need help in getting it open."

"Of course! This is wonderful. Copies of The Books!" the Reader exclaimed. "We thought we had the only one left in the world!"

"Not just The Books, Stamford; other books," the Toon Leader told him. "The books which are mentioned in The Books. But of course we will help you. You have a map to show where they are?"

"Not a map; just some information. But we can work out the location of the crypt."

"A ritual," Stamford Rawson said happily. "Of course."

They lunched together at the house of Toon Sarge Hughes with the Toon Leader and the Reader and five or six of the leaders of the community. The food was plentiful, but Altamont found himself wishing that the first book they found in the Carnegie Library crypt would be a cook book.

In the afternoon, he and Loudons separated. The latter attached himself to the Tenant, the Reader, and an old woman, Irene Klein, who was almost a hundred years old and was the repository and arbiter of most of the community's oral legends. Altamont, on the other hand, started, with Alex Barrett, the gunsmith, and Mordecai Ricci, the miller, to inspect the gunshop and grist mill. Joined by half a dozen more of the village craftsmen, they visited the forge and foundry, the sawmill, the wagon shop. Altamont looked at the flume, a rough structure of logs lined with sheet

aluminum, and at the nitriary, a shed-roofed pit in which potassium nitrate was extracted from the community's animal refuse. Then, loading his guides into the helicopter, they took off for a visit to the powder mill on the island and a trip up the river.

They were a badly scared lot, for the first few minutes, as they watched the ground receding under them through the transparent plastic nose. Then, when nothing disastrous seemed to be happening, exhilaration took the place of fear, and by the time they set down on the tip of the island, the eight men were confirmed aviation enthusiasts. The trip up-river was an even bigger success; the high point came when Altamont set his controls for *Hover*, pointed out a snarl of driftwood in the stream, and allowed his passengers to fire one of the machine guns at it. The lead balls of their own black-powder rifles would have plunked into the waterlogged wood without visible effect; the copper-jacketed machine-gun bullets ripped it to splinters. They returned for a final visit to the distillery awed by what they had seen.

"Monty, I don't know what the devil to make of this crowd," Loudons said, that evening, after the feast, when they had entered the helicopter and prepared to retire. "We've run into some weird communities—that lot down in Old Mexico who live in the church and claim they have a divine mission to redeem the world by prayer, fasting and flagellation, or those yogis in Los Angeles—"

"Or the Blackout Boys in Detroit," Altamont added.

"That's understandable," Loudons said, "after what their ancestors went through in the Last War. But this crowd, here! The descendants of an old United States Army infantry platoon, with a fully developed religion centered on a slain and resurrected god —Normally, it would take thousands of years for a slain-god religion to develop, and then only from the field-fertility magic of primitive agriculturists. Well, you saw these people's fields from the air. Some of the members of that old platoon were men who knew the latest methods of scientific farming; they didn't need naive fairy tales about the planting and germination of seed."

"Sure this religion isn't just a variant of Christianity?"

"Absolutely not. In the first place, these Sacred Books can't be the Bible —you heard Tenant Jones say that they mentioned firearms that used cartridges. That means that they can't be older than 1860 at the very earliest. And in the second place, this slain god wasn't crucified or put to death by any form of execution; he perished, together with his enemy, in combat, and both god and devil were later resurrected. The Enemy is supposed to be the master mind back of these cannibal savages in the woods and

also in the ruins."

"Did you get a look at these Sacred Books, or find out what they might be?"

Loudons shook his head disgustedly. "Every time I brought up the question, they evaded. The Tenant sent the Reader out to bring in this old lady, Irene Klein—she was a perfect gold mine of information about the history and traditions of the Toon, by the way—and then he sent him out on some other errand, undoubtedly to pass the word not to talk to us about their religion."

"I don't get that," Altamont said. "They showed me everything they had—their gunshop, their powder mill, their defenses, everything." He smoked in silence for a moment. "Say, this slain god couldn't be the original platoon commander, could he?"

"No. They have the greatest respect for his memory—decorate his grave regularly, drink toasts to him—but he hasn't been deified. They got the idea for this deity of theirs out of the Sacred Books." Loudons gnawed the end of his cigar and frowned. "Monty, this has me worried like the devil, because I believe that they suspect that you are the Slain and Risen One."

"Could be, at that. I know the Tenant came up to me, very respectfully, and said, 'I hope you don't think, sir, that I was presumptuous in trying to display my humble deductive abilities to *you*.'"

"What did you say?" Loudons demanded rather sharply.

"Told him certainly not; that he'd used a good quick method of demonstrating that he and his people weren't like those mindless subhumans in the woods."

"That was all right. I don't know how we're going to handle this. They only suspect that you are their deity. As it stands, now, we're on trial, here. And I get the impression that logic, not faith, seems to be their supreme religious virtue; that skepticism is a religious obligation instead of a sin. That's something else that's practically unheard of. I wish I knew—"

Tenant Mycroft Jones, and Reader Stamford Rawson, and Toon Sarge Verner Hughes, and his son Murray Hughes, sat around the bare-topped table in the room, on the second floor of the Aitch-Cue House. A lighted candle flickered in the cool breeze that came in through the open window, throwing their shadows back and forth on the walls.

"Pass the tantalus, Murray," the Tenant said, and the youngest of the four handed the corncob-corked bottle to the eldest. Tenant Jones filled his cup, and then sat staring at it, while Verner Hughes thrust his pipe into the toe of the moccasin and filled it. Finally, he drank about half of the clear wild-plum brandy.

"Gentlemen, I am baffled," he confessed. "We have three alternate possibilities here, and we dare not disregard

any of them. Either this man who calls himself Altamont is truly He, or he is merely what we are asked to believe, one of a community like ours, with more of the old knowledge than we possess."

"You know my views," Verner Hughes said. "I cannot believe that He was more than a man, as we are. A great, a good, a wise man, but a man and mortal."

"Let's not go into that, now." The Reader emptied his cup and took the bottle, filling it again. "You know my views, too. I hold that He is no longer upon earth in the flesh, but lives in the spirit and is only with us in the spirit. There are three possibilities, too, none of which can be eliminated. But what was your third possibility, Tenant?"

"That they are creatures of the Enemy. Perhaps that one or the other of them *is* the Enemy."

Reader Rawson, lifting his cup to his lips, almost strangled. The Hugheses, father and son, stared at Tenant Jones in horror.

"The Enemy—with such weapons and resources!" Murray Hughes gasped. Then he emptied his cup and refilled it. "No! I can't believe that; he'd have struck before this and wiped us all out!"

"Not necessarily, Murray," the Tenant replied. "Until he became convinced that his agents, the Scowrers, could do nothing against us, he would bide his time. He sits motionless, like a spider, at the center of the web; he does little himself; his agents are numerous. Or, perhaps, he wishes to recruit us into his hellish organization."

"It is a possibility," Reader Rawson admitted. "One which we can neither accept nor reject safely. And we must learn the truth as soon as possible. If this man is really He, we must not spurn Him on mere suspicion. If he is a man, come to help us, we must accept his help; if he is speaking the truth, the people who sent him could do wonders for us, and the greatest wonder would be to make us, again, a part of a civilized community. And if he is the Enemy—"

"If it is really He," Murray said, "I think we are on trial."

"What do you mean, son? Oh, I see. Of course, I don't believe he is, but that's mere doubt, not negative certainty. But if I'm wrong, if this man is truly He, we are being tested. He has come among us incognito; if we are worthy of Him, we will penetrate His disguise."

"A very pretty problem, gentlemen," the Tenant said, smacking his lips over his brandy. "For all that it may be a deadly serious one for us. There is, of course, nothing that we can do tonight. But tomorrow, we have promised to help our visitors, whoever they may be, in searching for this crypt in the city. Murray, you were to be in charge of the detail that was to accompany them. Carry on as arranged, and say nothing of our sus-

picions, but advise your men to keep a sharp watch on the strangers, that they may learn all they can from them. Stamford, you and Verner and I will go along. We should, if we have any wits at all, observe something."

"Listen to this infernal thing!" Altamont raged. "'*Wielding a gold-plated spade handled with oak from an original rafter of the Congressional Library, at three-fifteen one afternoon last week*—' One afternoon last week!" He cursed luridly. "Why couldn't that blasted magazine say *what* afternoon? I've gone over a lot of twentieth century copies of that magazine; that expression was a regular cliché with them."

Loudons looked over his shoulder at the photostated magazine page.

"Well, we know it was between June thirteen and nineteen, inclusive," he said. "And there's a picture of the university president, complete with gold-plated spade, breaking ground. Call it Wednesday, the sixteenth. Over there's the tip of the shadow of the old Cathedral of Learning, about a hundred yards away. There are so many inexactitudes that one'll probably cancel out another."

"That's so, and it's also pretty futile getting angry at somebody who's been dead two hundred years, but why couldn't they say Wednesday, or Monday, or Saturday, or whatever?" He checked back in the astronomical handbook, and the photostated pages of the old almanac, and looked over his calculations. "All right, here's the angle of the shadow, and the compass-bearing. I had a look, yesterday, when I was taking the local citizenry on that junket. The old baseball diamond at Forbes Field is plainly visible, and I located the ruins of the Cathedral of Learning from that. Here's the above-sea-level altitude of the top of the tower. After you've landed us, go up to this altitude—use the barometric altimeter, not the radar—and hold position."

Loudons leaned forward from the desk to the contraption Altamont had rigged in the nose of the helicopter—one of the telescope-sighted hunting rifles clamped in a vise, with a compass and a spirit-level under it.

"Rifle's pointing downward at the correct angle now?" he asked. "Good. Then all I have to do is hold the helicopter steady, keep it at the right altitude, level, and pointed in the right direction, and watch through the sight while you move the flag around, and direct you by radio. Why wasn't I born quintuplets?"

"Mr. Altamont! Dr. Loudens!" a voice outside the helicopter called. "Are you ready for us, now?"

Altamont went to the open door and looked out. The old Toon Leader, the Reader, Toon Sarge Hughes, his son, and four young men in buckskins with slung rifles, were standing outside.

"I have decided," the Tenant said, "that Mr. Rawson and Sarge Hughes

and I would be of more help than an equal number of younger men. We may not be as active, but we know the old ruins better, especially the paths and hiding places of the Scowrers. These four young men you probably met last evening; it will do no harm to introduce them again. Birdy Edwards; Sholto Jiminez; Jefferson Burns; Murdo Olsen."

"Very pleased, Tenant, gentlemen. I met all you young men last evening; I remember you," Altamont said. "Now, if you'll all crowd in here, I'll explain what we're going to try to do."

He showed them the old picture. "You see where the shadow of a tall building falls?" he asked. "We know the location and height of this building. Dr. Loudons will hold this helicopter at exactly the position of the top of the building, and aim through the sights of the rifle, there. One of you will have this flag in his hand, and will move it back and forth; Dr. Loudons will tell us when the flag is in the sight of the rifle."

"He'll need a good pair of lungs to do that," Verner Hughes commented.

"We'll use radio. A portable set on the ground, and the helicopter's radio set." He was met, to his surprise, with looks of incomprehension. He had not supposed that these people would have lost all memory of radio communication.

"Why, that's wonderful!" the Reader exclaimed, when he explained. "You can talk directly; how much better than just sending a telegram!"

"But, finding the crypt by the shadow; that's exactly like the—" Murray Hughes began, then stopped short. Immediately, he began talking loudly about the rifle that was to be used as a surveying transit, comparing it with the ones in the big first-floor room at the Aitch-Cue House.

Locating the point on which the shadow of the old Cathedral of Learning had fallen proved easier than either Altamont or Loudons had expected. The towering building was now a tumbled mass of slagged rubble, but it was quite possible to determine its original center, and with the old data from the excellent reference library at Fort Ridgeway, its height above sea level was known. After a little jockeying, the helicopter came to a hovering stop, and the slanting barrel of the rifle in the vise pointed downward along the line of the shadow that had been cast on that afternoon in June, 1993, the cross hairs of the scope-sight centered almost exactly on the spot Altamont had estimated on the map. While he peered through the sight, Loudons brought the helicopter slanting down to land on the sheet of fused glass that had once been a grassy campus.

"Well, this is probably it," Altamont said. "We didn't have to bother fussing around with that flag, after all. That hump, over there, looks as

though it had been a small building, and there's nothing corresponding to it on the city map. That may be the bunker over the stair-head to the crypt."

They began unloading equipment—a small portable nuclear-electric conversion unit, a powerful solenoid-hammer, crowbars and intrenching tools, tins of blasting-plastic. They took out the two hunting rifles, and the autocarbines, and Altamont showed the young men of Murray Hughes' detail how to use them.

"If you'll pardon me, sir," the Tenant said to Altamont, "I think it would be a good idea if your companion went up in the flying machine and circled around over us, to keep watch for Scowrers. There are quite a few of them, particularly farther up the rivers, to the east, where the damage was not so great and they can find cellars and shelters and buildings to live in."

"Good idea; that way, we won't have to put out guards," Altamont said. "From the looks of this, we'll need everybody to help dig into that thing. Hand out one of the portable radios, Jim, and go up to about a thousand feet. If you see anything suspicious, give us a yell, and then spray it with bullets, and find out what it is afterward."

They waited until the helicopter had climbed to position and was circling above, and then turned their attention to the place where the sheet of fused earth and stone bulged upward. It must have been almost ground-zero of one of the hydrogen-bombs; the wreckage of the Cathedral of Learning had fallen predominantly to the north, and the Carnegie Library was tumbled to the east.

"I think the entrance would be on this side, toward the Library," Altamont said. "Let's try it, to begin with."

He used the solenoid-hammer, slowly pounding a hole into the glaze, and placed a small charge of the plastic explosive. Chunks of the lavalike stuff pelted down between the little mound and the huge one of the old

library, blowing a hole six feet in diameter and two and a half deep, revealing concrete bonded with crushed steel-mill slag.

"We missed the door," he said. "That means we'll have to tunnel in through who knows how much concrete. Well—"

He used a second and larger charge, after digging a hole a foot deep. When he and his helpers came up to look, they found a large mass of concrete blown out, and solid steel behind it. Altamont cut two more holes sidewise, one on either side of the blown-out place, and fired a charge in each of them, bringing down more concrete. He found that he hadn't missed the door, after all. It had merely been concreted over.

A few more shots cleared it, and after some work, they got it open. There was a room inside, concrete-floored and entirely empty. With the others crowding behind him, Altamont stood in the doorway and inspected the interior with his flashlight; he heard somebody back of him say something about a most peculiar sort of a dark-lantern. Across the small room, on the opposite wall, was a bronze plaque.

It carried quite a lengthy inscription, including the names of all the persons and institutions participating in the microfilm project. The History Department at the Fort would be most interested in that, but the only thing that interested Altamont was the statement that the floor had been laid over the trapdoor leading to the vaults where the microfilms were stored. He went outside to the radio.

"Hello, Jim. We're inside, but the films are stored in an underground vault, and we have to tear up a concrete floor," he said. "Go back to the village and gather up all the men you can carry, and tools. Hammers and picks and short steel bars. I don't want to use explosives inside. The interior of the crypt oughtn't to be damaged, and I don't know what a blast in here might do to the film, and I don't want to take chances."

"No, of course not. How thick do you think this floor is?"

"Haven't the least idea. Plenty thick, I'd say. Those films would have to be well buried, to shield them from radioactivity. We can expect that it'll take some time."

"All right. I'll be back as soon as I can."

The helicopter turned and went windmilling away, over what had been the Golden Triangle, down the Ohio. Altamont went back to the little concrete bunker and sat down, lighting his pipe. Murray Hughes and his four riflemen spread out, one circling around the glazed butte that had been the Cathedral of Learning, another climbing to the top of the old library, and the others taking positions to the south and east.

Altamont sat in silence, smoking his pipe and trying to form some concep-

tion of the wealth under that concrete floor. It was no use. Jim Loudons probably understood a little more nearly what those books would mean to the world of today, and what they could do toward shaping the world of the future. There was a library at Fort Ridgeway, and it was an excellent one—for its purpose. In 1996, when the rockets had come crashing down, it had contained the cream of the world's technological knowledge—and very little else. There was a little friction, a few books of ideas, just enough to give the survivors a tantalizing glimpse of the world of their fathers. But now—

A rifle banged to the south and east, and banged again. Either Murray Hughes or Birdy Edwards—it was one of the two hunting rifles from the helicopter. On the heels of the reports, they heard a voice shouting: "Scowrers! A lot of them, coming from up the river!" A moment later, there was a light whip-crack of one of the long muzzle-loaders, from the top of the old Carnegie Library, and Altamont could see a wisp of gray-white smoke drifting away from where it had been fired. He jumped to his feet and raced for the radio, picking it up and bringing it to the bunker.

Tenant Jones, old Reader Rawson, and Verner Hughes had caught up their rifles. The Tenant was shouting, "Come on in! Everybody, come in!" The boy on top of the library began scrambling down. Another came running from the direction of the half-demolished Cathedral of Learning, a third from the baseball field that had served as Altamont's point of reference the afternoon before. The fourth, Murray Hughes, was running in from the ruins of the old Carnegie Tech buildings, and Birdy Edwards sped up the main road from Shenley Park. Once or twice, as he ran, Murray Hughes paused, turned, and fired behind him.

Then his pursuers came into sight. They ran erect, and they wore a few rags of skin garments, and they carried spears and hatchets and clubs, so they were probably classifiable as men. Their hair was long and unkempt; their bodies were almost black with dirt and from the sun. A few of them were yelling; most of them ran silently. They ran more swiftly than the boy they were pursuing; the distance between them narrowed every moment. There were at least fifty of them.

Verner Hughes' rifle barked; one of them dropped. As coolly as though he were shooting squirrels instead of his son's pursuers, he dropped the butt of his rifle to the ground, poured a charge of powder, patched a ball and rammed it home, replaced the ramroad. Tenant Jones fired then, and then Birdy Edwards joined them and began shooting with the telescope-sighted hunting rifle. The young man who had been north of the Cathedral of Learning had one of the auto-carbines; Altamont had providently set the fire-

control for semi-auto before giving it to him. He dropped to one knee and began to empty the clip, shooting slowly and deliberately, picking off the runners who were in the lead. The boy who had started to climb down off the library halted, fired his flintlock, and began reloading it. And Altamont, sitting down and propping his elbows on his knees, took both hands to the automatic which was his only weapon, emptying the magazine and replacing it. The last three of the savages he shot in the back; they had had enough and were running for their lives.

So far, everybody was safe. The boy in the library came down through a place where the wall had fallen. Murray Hughes stopped running and came slowly toward the bunker, putting a fresh clip into his rifle. The others came drifting in.

"Altamont, calling Loudons," the scientist from Fort Ridgeway was saying into the radio. "Monty to Jim; can you hear me, Jim?"

Silence.

"We'd better get ready for another attack," Birdy Edwards said. "There's another gang coming from down that way. I never saw so many Scowrers!"

"Maybe there's a reason, Birdy," Tenant Jones said. "The Enemy is after big game, this time."

"Jim! Where the devil are you?" Altamont fairly yelled into the radio, and as he did, he knew the answer. Loudons was in the village, away from the helicopter, gathering tools and workers. Nothing to do but keep on trying.

"Here they come!" Reader Rawson warned.

"How far can these rifles be depended on?" Birdy Edwards wanted to know.

Altamont straightened, saw the second band of savages approaching, about four hundred yards away.

"Start shooting now," he said. "Aim for the upper part of their bodies."

The two auto-loading rifles began to crack. After a few shots, the savages took cover. Evidently they understood the capabilities and limitations of the villagers' flintlocks; this was a terrifying surprise to them.

"Jim!" Altamont was almost praying into the radio. "Come in, Jim!"

"What is it, Monty? I was outside." Altamont told him.

"Those fellows you had up with you yesterday; think they could be trusted to handle the guns? A couple of them are here with me," Loudons inquired.

"Take a chance on it; it won't cost you anything but my life, and that's not worth much at present."

"All right; hold on. We'll be along in a few minutes."

"Loudons is bringing the helicopter," he told the others. "All we have to do is hold on, here, till he comes."

A naked savage raised his head from behind what might, two hundred years ago, have been a cement park-bench, a hundred yards away. Reader

Stamford Rawson promptly killed him and began reloading.

"I think you're right, Tenant," he said. "The Scowrers have never attacked in bands like this before. They must have had a powerful reason, and I can think of only one."

"That's what I'm beginning to think, too," Verner Hughes agreed. "At least, we have eliminated the third of your possibilities, Tenant. And I think probably the second, as well."

Altamont wondered what they were double-talking about. There wasn't any particular mystery about the mass attack of the wild men to him. Debased as they were, they still possessed speech and the ability to transmit experiences. No matter how beclouded in superstition, they still remembered that aircraft dropped bombs, and bombs killed people, and where people had been killed, they would find fresh meat. They had seen the helicopter circling about, and had heard the blasting; every one in the area had been drawn to the scene as soon as Loudons had gone down the river.

Maybe they had forgotten that aircraft also carried guns. At least, when they sprang to their feet and started to run at the return of the helicopter, many did not run far.

Altamont and Loudons shook hands many times in front of the Aitch-Cue House, and listened to many good wishes, and repeated their promise to return. Most of the microfilmed books were still stored in the old church; they were taking away with them only the catalogue and a few of the more important works. Finally, they entered the helicopter. The crowd shouted farewell, as they rose.

Altamont, at the controls, waited until they had gained five thousand feet, then turned on a compass-course for Colony Three.

"I can't wait till we're in radio-range of the Fort, to report this, Jim," he said. "Of all the wonderful luck! And I don't yet know which is more important; finding those books, or finding those people. In a few years, when we can get them supplied with modern equipment and instructed in its use—"

"I'm not very happy about it, Monty," Loudons confessed. "I keep thinking about what's going to happen to them."

"Why, nothing's going to happen to them. They're going to be given the means of producing more food, keeping more of them alive, having more leisure to develop themselves in—"

"Monty; I saw the Sacred Books."

"The deuce! What were they?"

"It. One volume; a collection of works. We have it at the Fort; I've read it. How I ever missed all the clues— You see Monty, what I'm worried about is what's going to happen to those people when they find out that we're not really Sherlock Holmes and Dr. Watson."

THE END

THAT PROFESSIONAL LOOK

BY LEONARD LOCKHARD

__This__ isn't exactly a factual article, nor is it quite fiction—but it does present some facts about the operation of the patent system. And somewhere around here there does seem to be somebody just a little "tetched"!

Illustrated by Kelly Freas

"The patent law profession," Helix Spardleton, Esq. had explained at my job interview, "is not founded on any known system of logic. This is what gives all patent lawyers that peculiar professional look. Not one knows what he will be faced with tomorrow. Nor is the profession governed by tradition or statutory code — of which it has both — because these are observed only in their consistent violation. Then what, you ask, *is* the foundation of patent law? It is this: an iron-clad, invariant system of exceptions to a set of ever-changing, quasi-existent rules. Which is why only a peculiar variety of mentality can succeed as a patent lawyer.

"Now, Mr. Saddle," he had continued, "you've been thoroughly forewarned, and yet you still want to be a patent lawyer. That in itself is proof that you are not completely sane. You're hired. And here's your first assignment. One of my most prolific clients, Dr. Nathaniel Marchare, wants to file a patent application on a synthetic baby. Go out to his lab and get the data you need. And don't forget these diapers for the baby."

My head was still spinning when I stepped unsteadily from the taxi before a multi-windowed brick building in Alexandria, Virginia. But I hitched up my mental pants, shouldered my bundle and strode confidently up the

walk. I mustn't let this client suspect I'd never before written a patent specification on anything, much less a synthetic baby.

Dr. Nathaniel Marchare proved to be a large and lanky gentleman clad haphazardly in overalls and an old lab coat. Without being exactly wall-eyed, he gave the impression of ignoring two things at once while devoting his undivided attention to both. I later learned that royalties on his numberless patents, ranging from magnetrons, to an ion exchange resin that converted water to alcohol, had left him free to follow his research will-o'-the-wisp whither it led him. I suppose following it up numerous and bifurcated paths made him look that way.

Right now it led him into one of the smaller inner rooms of his laboratory, with me in tow.

"Here's the nursery," he said proudly, "and there's Daniel. What do you think of him?"

"Why he looks fine," I said. "He doesn't look . . . ah . . . synthesized at all."

"Of course not. He's a perfectly fine and normal little boy. He doesn't even have those little things wrong with him that children born normally so often have. You know, marks, bent heads, and things."

"Oh, sure." I had thought all babies

looked alike, but then, I had always been able to take babies or leave them alone. Daniel looked just like any other kid to me.

"Well," I said, pulling out my notebook and pencil, "if you'll tell me how you put him together —"

"Certainly. This way to the vat room."

We walked down corridors past many beautifully equipped laboratories until we finally reached the vat room. The vat room held row on row of empty barrel-shaped vessels. Some were glass, others ceramic, and still others were of various alloys. Over in the corner was an old iron sink. The vats were all fitted out with covers and heating jackets. An intricate piping system connected them together. It was a dizzying sight. I couldn't make heads or tails of the equipment.

Then Dr. Marchare started to explain. He talked for half an hour and then sent out for some chairs so we could be comfortable while he talked some more. I took down everything he said. We broke for lunch, came back, and he talked some more.

Like many great inventions this one had come about in a slightly unexpected manner. Marchare had been trying to synthesize a human fetus all right. He charged each vat with its own mixture of minerals and organics and nutrients. Unwanted materials went down the iron sink. No one knew it at the time but the sink was plugged up. There was a supersonic sound generator stored under the sink and one day an assistant named Callahan, plugged it in by accident. Exactly nine months and three weeks later Daniel was born. Marchare was such a meticulous workman that he was able to figure out exactly what he had thrown down the sink.

I finally finished taking down everything Marchare and Callahan had done. I shook hands good-by and went home and went to bed. My first day as a patent attorney had been an exhausting one.

The next day I wrote up a space describing how to make a synthetic baby and submitted it for Mr. Spardleton's approval.

He started shaking his head before he'd finished the first line.

"Is anything wrong?" I asked anxiously.

But he just sat there, staring glumly at the sheets.

"I rechecked most of the details with Marchare and Callahan," I ventured. "I thought I wrote it up fairly clearly, the way they taught us in Writing the Technical Report, at school."

"And from the looks of this you got A-plus." He groaned softly. "Young man, now that you are in my employ you'll have to learn there's not the vaguest connection between patents and technical reports. Or even between normal English and patent

English. Let me ask you—have you ever read a patent you could understand?"

Now, in law school we had had to read dozens of patents, but up to now I had never admitted that they were Greek to me, because I didn't want anyone to suspect my incompetence in my chosen profession. However, there was something in the way he asked the question that promised to clear up the mystery. "You mean they're written that way *on purpose?*"

"Certainly. In this business we must avoid clarity at all costs. There're lots of reasons for it. Suppose the patent is litigated; it's got two strikes against it if the judge understands it before the inventor's lawyer can get to him with the . . . ah . . . proper explanation. Furthermore, if you describe something explicitly, the patent examiner will make you limit your claims to that specific showing. And then, too, if you explain the invention in the clear and precise terms required by law, your competitors will have no trouble at all operating it after the patent expires."

"Huh?"

But he pressed on. "Distinct, unequivocal, and precise ambiguity—*that's* what we strive for, Saddle. So now, in the light of these principles, let's examine your title for this application, 'Synthetic Baby.' You can see now, of course, that'll never do. Yes, narrowly speaking, the invention *is* a synthetic baby. But you must keep in mind that a patent is worth something only if your competitors can not get around it. If they escape infringing your patent through some technicality, it is usually the fault of the patent attorney. And the title is very important. Look at the case of Alumino-Thermic Corporation v. Goldschmidt Thermic Corporation 25 F.2d 206. The infringement ruling in that case was based partly on the title. So let's go over your title, 'Synthetic Baby.' Suppose a competitor varies the process slightly and produces a synthetic chimpanzee?"

"Maybe I could title it 'Synthetic Anthropoid,' " I said.

"Still not good. What if your competitor changes it just a little more and brings forth a mouse, or a calf, or an elephant."

"Well, perhaps I'd better call it 'Synthetic Mammal.' "

"Or a salamander, frog, or platypus?"

" 'Synthetic Chordate'?" I asked. "At least they all have spinal columns."

He sighed. "Did you see Daniel's?"

"No, but I assume—"

"Save your assumptions for the body of the spec. They're poison in the title."

"But *you* were doing plenty of assuming," I began, when I recognized just in time that I was merely seeking refuge in logic. "Then how about 'Synthetic *Being*'?" I said desperately.

"Hm-m-m. Suppose a competitor made synthetic lambs and slaughtered them the instant before birth? The dastard wouldn't infringe."

" 'Synthetic Product,' " I said grimly.

He considered that with his black eyes fastened thoughtfully on the autographed photograph of Justice Holmes hanging on the opposite wall, the one that needed retouching because the great justice had let his left eye droop into the suggestion of a wink.

"It's still a little clear," he said finally. "But now that word 'synthetic' troubles me. The word suggests the existence of an identical *natural* product."

I said, "We certainly don't want to admit that there are already in existence two billion naturally occurring anticipatory equivalents."

"Now you're getting the idea! There's always a chance that the examiner will make a hurried search and miss the prior art."

"All right," I said. "Why not just call it 'Product'?"

His face brightened immediately. "Splendid! 'Product' it is. You can broaden the description and claims to correspond. You see what I'm driving at now, don't you?"

"Oh, certainly. Certainly. I can see where I've got a lot of rewriting to do here. Now that you've checked over the title, why don't I rewrite the rest before you check it?"

"Good idea. Keep this in mind: Even though Marchare is a brilliant man he doesn't know what an invention is. Neither does anybody else for that matter, but a patent attorney recognizes the difficulty. You know the old saying, 'An inventor is a man with an idea and a good attorney? Keep your language broad. Let's see how you claimed the invention."

He turned to the last page of the specification and read: "We claim:

1. A synthetic human infant."

He stared at it for a minute while his cigar slowly sagged. Then he looked up at me and said, "Come now. You can do better than that. Why do you limit the claims to 'human' and why limit it to 'infant'? Just say, 'A synthetic being.' We'll change it later."

"Well", I said, "Marchare only made one run so I can only give one example in the spec. I looked up the law. According to the case of In re Oppenauer and a lot of others, you have to give a reasonable number of examples to support a broad claim in chemical cases. I've only got one example, a synthetic human infant."

He shook his head gently, sending up a zigzag column of smoke that looked like a lazy bolt of lightning. "Didn't they teach you in law school that you can always find a case to support whatever point of view you want?"

"Well, a couple of professors did

say that, but I always thought they were joking."

"That was no joke. They were slipping you the real thing, only they had to disguise it a little; they didn't dare come right out and say it. Anyhow, can't you think of a way to get around those cases that say you can only claim what your example shows?"

"I tried. I couldn't find a single case the other way. I don't see how to do it. Do you?"

"Ever hear of Ex parte Haber?"

I shook my head.

"Oh, sure you have. You must have learned *something* in your patent law courses. Ex parte Haber is only one of the series of cases that hold that a single example will support a broad claim—in mechanical cases. So just write your spec as though it were a mechanical case."

"A mechanical case," I stammered. "But it's all chemistry. How can I—?"

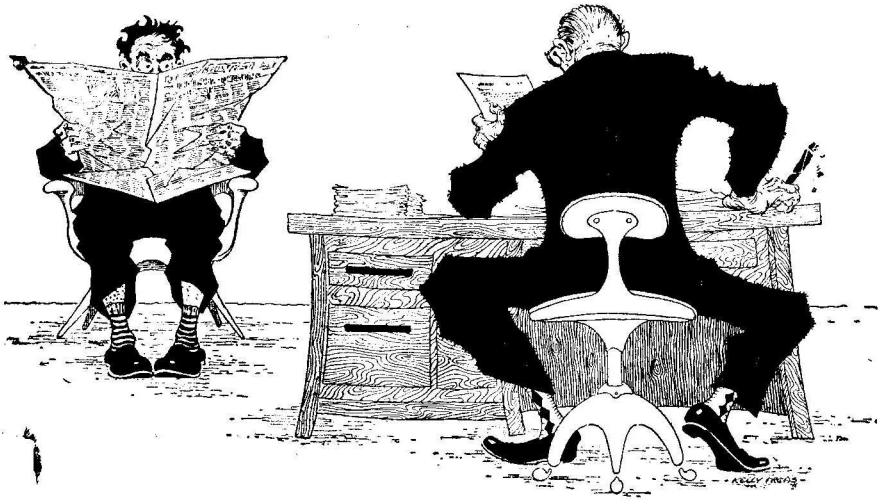
He waved his cigar depreciatingly. "*Tut tut*, my boy. You'll think of something. Why, I once got a patent for a client in which the only reason the Examiner allowed it was because I convinced him that magnesium was an alkaline-earth metal. Two years later I got another patent for another client solely because I was able to convince the Examiner that magnesium was *not* an alkaline-earth metal. So write up your mechanical case convincingly. Now go to it." And he waved me out of the room.

I went to work. I took every one of Marchare's sentences and expanded it to a paragraph. I felt ridiculous. Never had the English language taken such a beating. On page 2 I hit a place where Marchare had said, "Ethanol worked at 32° C." I don't know what got into me but I decided to show Spardleton how silly it would be if I followed his instructions literally. So in place of, "Ethanol worked at 32° C," I wrote:

"Here one may use a compound of the formula ROH where R is any element of the periodic table, or any combination thereof, preferably C_2H_5, but not limited thereto, at a temperature ranging from approximately 273° C to that commonly encountered in the hotter stars, preferably 32° C, but not limited thereto."

A little later in the spec I ran across Marchare's sentence, "The chloride was used." This I rewrote as: "While the working example discloses the use of the chloride, the other halides are suitable, as well as the sulfate, nitrate, phosphate, silicate, tungstate, chloroplatinate, thionate, epizootate, and other anions well-known to those skilled in the art."

I read it over and something snapped in my mind. I started over again and rewrote every sentence in similar vein. My description ranged from plus infinity to minus infinity although I was always careful to point out that I preferred something somewhere in the middle.



I proved that a human being was nothing more than a mechanical device by citing various medical references that described the skeletal and muscle structure of man. I cited other works that compared the nervous system with a calculating machine.

After nine days of rewriting I was done. My original four-page specification was now a lovely manuscript of eighty-four pages. I took it in to Spardleton. He hefted it approvingly and started to read. I sat down waiting for the explosion. I picked up a newspaper and tried to while away the time.

An hour went by. Not a word from Spardleton, only an occasional rumble from deep down in his chest. I was so busy covertly watching him that I never got beyond the front page.

Finally he dropped the spec on his desk and got up. I got up, too. He came around the desk toward me and flung his right hand up. Instinctively I ducked, but he caught my shoulder and gripped it. Straight into my eyes he looked and said, his voice deep and trembling slightly, "Saddle, you've got the touch. You're going to be a patent man."

He turned and went back to his desk, blowing his nose as he went. "It's good," he said. "File it as it stands. I have no suggestions to make."

As soon as I got my wits together I took the spec out to Dr. Marchare for his approval. His sole under-the-breath comment sounded like "Ho-ly cow." He signed the oath in front of a notary, and I took the case over to the Patent Office and filed it at the Cashier's window. After that there was nothing to do but wait.

Time went by fast. Under Mr. Spardleton's close tutelage I prepared several infringement and validity opinions. I drafted several more specifications learning new tricks as I went along. I was so busy that I forgot all about the synthetic baby case. Then one morning Mr. Spardleton called me into his office. I knew there was trouble as soon as I entered.

"Look at this, Carl," he said. And he handed me an Office Action. I read:

Address Only
The Commissioner of Patents
Washington 25, D. C.

Paper No. 3

DEPARTMENT OF COMMERCE — U. S. PATENT OFFICE
United States Patent Office
Washington

Herbert Krome/vpt

Nov. 9, 1960
MAILED

Please find below a communication from the EXAMINER in charge of this application.

Horace P. Budder
Commissioner of Patents

Carl Saddle
1637 National Press Bldg.
Washington 4, D. C.

Division: 60
Applicant: Marchare & Callahan
Ser. No.: 222,559
Filed: April 13, 1960
For: Product

This application has been examined.

Patents cited:

Hughes	109,410	Nov. 22, 1870	128/284
Goldstein	1,836,794	Dec. 15, 1931	128/284

Publication of general interest:

Genesis, Chap 1, verse 27 (Copy in Patent Office Library)

All claims are rejected as obviously met by the art. The Hughes patent shows a picture of a human infant, while Goldstein, page 1, line 4, uses the word "baby." The word "baby" in Goldstein can only refer to a human being since the patent describes a diaper for the baby (see page 1, lines 13-16) and only human infants wear diapers; see any standard work on biology or child care. The art cited shows the existence of human infant(s). There is no patentable invention in the synthetic product over the natural product.

No claim is allowed.

Examiner

I gulped and looked up at Spardleton. He pointed grimly to the name in the upper left-hand corner and said, "Nothing is spared us. Herbert Krome is the Examiner in the case. But we'll fight, Carl." He put his hand on my shoulder and gazed levelly into my eyes, "This is your baby. You have been coming along very nicely. I want you to have an interview with Krome and GET US A CLAIM. Can you do it?"

I couldn't speak, so I nodded.

"Good," he said. He went over and sat down at his desk and held out his hand, "Let me have that Action."

I passed it to him and he read it carefully. He began to shake his head muttering slowly, "Bad. Very bad. He's up to something. Herbie has a trick up his sleeve."

I found my voice. "Why? It looks like he's just rejecting the case on prior art. He's stated his position clearly. We ought to be able to beat him down by—"

Spardleton interrupted me with a pitying glance. "My boy," he said gently, "that's just the trouble. He's stated his position clearly. That's why I'm afraid." He tilted back. "You see, people in patent work never use the English language in the conventional way. Everything means something else, and you just have to learn the meaning of the words as you would a foreign language. Look here," and he bent forward and picked up at random a file of an application he was prosecuting. He turned to the last Office Action and glanced down it. "Oh. Here. Listen to what this says:

" 'Applicant has submitted thirteen affidavits attempting to prove the formula CH_3COOH. These cannot be considered, as applicant failed to state whether his calculations were based on the atomic weights of Dalton or Priestly.'

"Now. What does that mean?"

I said, "Why, that's ridiculous. It doesn't matter a bit whose atomic weights are used. The Examiner is just finding excuses. He's just—"

"Hold it. You are taking his words in their usual sense. You can't do that, you have to translate. What the Examiner *means* by that is: 'I still haven't found any prior art, but I'll keep trying.' See?"

I nodded dumbly. Spardleton dropped the application and picked up a copy of the *United States Patent Quarterly*. He opened it at about the middle and then turned to the last paragraph of the opinion. "Yes," he said, "listen to this. The Board of Appeals says, 'We are unable to agree with applicant's contentions.' Now, what does that mean?"

"Well, it means the applicant lost his appeal."

"Yes, but it also means, 'The law can't be the way you say it is, because that would make the Examiner wrong.' "

Spardleton turned a few more pages, and said, "Here. Here's an opinion

from the Court of Customs and Patent Appeals. It says at the end, 'We are not convinced the Board erred.' Translation: 'We can't understand this case.'"

He threw the book down, saying, "So it goes. You have to be able to speak the language otherwise you don't know what to do next. Now getting back to Krome's Office Action, he hasn't used any of the catch phrases. He appears to have used unambiguous English so he must have something up his sleeve. Either that or he's convinced that a synthetic baby is patentable. I don't know. You study the law carefully. Build up some powerful arguments, then go over for an interview with him. O.K.? Go to it."

I left.

For two days I studied. I tried to anticipate all of Krome's possible arguments. I spent a lot of time in the Underwood Digest looking up cases. I read some of "Walker on Patents," and some of McCready's "Patent Office Practice," to see what they said about the points I thought were pertinent.

Then came the afternoon of the interview. I drank several cups of coffee to drown the butterflies in my stomach, and set out for the Patent Office for my first big interview.

I located Division 60 on the seventh floor and asked the clerk where Mr. Krome was. She steered me toward the end room. I entered. And there at his desk sat Herbert Krome.

He was a normal looking man, a little above medium height and a little above medium weight. His hair and eyes were black and he wore a small, dark mustache. He was bent over his work reading a patent application and chuckling quietly to himself. I stepped up to his desk.

"Mr. Krome?"

"Yes, yes, yes. What is it?" he said in a booming voice without even looking up.

"I'd like to talk to you, sir, if I may, about this Marchare case, the synthetic baby. I have an appointment."

He slowly leaned back in his chair. His dark eyes smacked into my face, and then traveled to my neck, chest, and stomach, and thence down to my feet. Having arrived at the end of the line, they started up again, moving even more slowly. I could feel his gaze in my marrow, but I stood my ground. For this was Krome's well-known once over. Many an attorney had broken under it and turned and fled. But I stood my ground.

He said, "You are the attorney of record?"

"Yes, I'm Carl Saddle."

"All right. I have your application right here. Now what did you want to say?"

I pulled up a chair and opened my copy of the application. I cleared my throat and said, "Mr. Krome. For

centuries scientists have sought for the secret of life. The best minds in the world have tackled the job and have failed. But Dr. Marchare has now succeeded; he has made a synthetic baby. It is my contention that his discovery is patentable under 35 USC 101. In fact, I believe that it would be impossible to conceive of a more important discovery. This is invention of the very highest order. This is—"

"Mr. Saddle," he interrupted, "look at your claim." He turned to Claim I. "You are claiming 'A synthetic being.' But I have cited two patents that clearly show the existence of a natural being. It is clearly settled in patent law that you can not patent the synthetic product when the natural product is known. Look here." He pulled open his upper right-hand drawer which was filled with thousands of small white cards. He lifted one out. "Here is a brief on the case of General Bakelite Co. v. Nikolas, 225 Fed 539. The courts said, and I'm quoting:

> 'A natural product, such as ordinary salt (Na Cl), could not be made the basis of a patent, nor could the discovery of the chemical reactions by which salt was formed in nature, from sodium and chlorine, be patented as a process.'

"There you have it," continued Krome. "That case is perfectly in point, perfectly sound. Just as salt is a product of nature, so your synthetic baby is a product of nature. There is no difference between the two from a patent viewpoint. You can not get claims drawn to a synthetic being when the natural being exists, unless there is some kind of difference between your synthetic being and a natural being. Your specification doesn't say so."

"That's right," I said. "There's no difference. Little Daniel is exactly like other children. But getting back to the case you just cited, the Aspirin Case went the other way. In the Aspirin Case—"

He snorted. "The Aspirin Case. Hah. Bad law. It means nothing."

"But it's a Supreme Court case. They—"

"That makes it even worse. By the time the aspirin patent reached the Supreme Court, the honorable justices were consuming the purified acetyl salicylic acid by the pound on account of the large number of patent cases they had to decide. So far as the Supreme Court was concerned, the aspirin patent carried its validity with it. But the decision was wrong and I will not follow it."

I had the uncomfortable feeling that I'd heard these words before somewhere, but I didn't remember where. I could see two days' work going up in smoke. I hadn't even got started with my arguments; I could visualize Spardleton's face when I returned and told him I had failed. Krome had not taken any of the positions I had anticipated;

he just stuck to what he had said in his Office Action.

Desperately I said to him, "Isn't there anything I can say or do that would convince you these claims are allowable, in spite of the General Bakelite Case. Affidavits maybe?"

He shook his head. "I'm afraid not. My position is sound both in logic and in law. We have a clean issue here, and I know I'm right. I am willing to go to the Board of Appeals on it."

My heart dropped. I was through. Herbert Krome had never been reversed by the Board of Appeals, or the Court of Custom and Patent Appeals, or any federal court. So if he were willing to take the case up, that ended it for me.

Sorrowfully I began to gather up my papers. Krome looked at me, startled, and said, "Where are you going?"

"Why," I said surprised, "back to my office. If you're not going to allow anything, I might just as well leave."

"Who said anything about not allowing anything? I merely said these claims aren't allowable since they fall squarely within the General Bakelite Case. I'm convinced that you've got patentable subject matter in the case, but you are not claiming it right. I think we can work out a claim that will be agreeable to both of us. But of course if you want to leave—"

"Oh, no. No. By all means let's work out a claim."

Gleefully I fanned out my papers again. "What do you suggest?"

"Well, I think your invention turns on the treatment of various chemicals with supersonic sound. I think we can work out a process claim easily. But you will want a product claim, too."

I nodded. "Yes. A product claim is always superior to a process claim because with it you can always catch an infringer no matter what process he uses to make the product."

He looked at me coldly. "Thank you, Mr. Saddle."

I decided to keep quiet.

"Now, let's see." He turned to his drawer again and pulled out half a dozen cards. He glanced at them and said, "According to In re McKee and a few other cases here, we can define the product by the process of making it. That way we escape coming under the doctrine of the General Bakelite Case."

I nodded happily.

He pulled out another card. "But according to In re Merz such practice is improper."

I held my breath while he looked at the cards contemplatively.

Finally he looked up and said, "I'll ignore the Merz Case. It's bad law, inconsistent." And he put the card back into the drawer. "Now let's see. We can start off by calling your product a-a-a human infant. Then we can say it is prepared by such and such a process."

I didn't like that. I remembered

how carefully Mr. Spardleton had shown me not to limit the title to a human being. I couldn't let the claim be so limited. I gathered up my courage and said, "But Mr. Krome. We shouldn't be required to limit the claim to the species Homo sapiens. By just changing the ratios a little we can produce any kind of fetus. It's all there in the spec."

"Maybe it is, but the only example you've given shows the production of Homo sapiens. Since you have not given a reasonable number of examples you can not get a generic claim. Here." He reached into his drawer and began pulling out cards and slapping them down in front of me. "Ex parte Calingaert. In re Prutton. In re—"

I held up my hand to stop him. "I know about all those cases. They are all here." And I plunked a large piece of paper down in front of him. "But," I continued, "those cases are all in the field of chemistry. They have nothing to do with our application here." I handed him another sheet. "Here are the cases to follow in the synthetic baby case. These are the ones that control mechanical cases. Look at them all. Ex parte Sharma, In re Ellis, and so on."

He read over my briefs, comparing them with his cards. "All right," he said. "Your cases may be good for mechanical applications, but this case is chemical. I realize you tried to make it mechanical in your specification, but you can't do that. It's not logical."

He whipped out a card. "According to Ex parte Welche you can't make your definitions 'absurd, erroneous, indefinite, or ambiguous'. You can't tell me that a human being is a mechanical device. That's absurd."

I shoved a paper at him. "According to Ex parte Designolle, considerable latitude is permitted an applicant in his definitions. Every applicant is his own lexicographer. I have given ample proof in the spec that a human being *can* be considered a mechanical device."

"But a human being has a soul," he said.

"Have you got a case to substantiate that point?" I countered.

He looked helplessly at his desk, and shook his head.

"Well, then, I submit that I can define a human being as a mechanical device."

He pondered. He thoughtfully studied my brief and his own. He stared up at the ceiling. I watched him while he made up his mind what the law was going to be. Suddenly he grunted and lapsed into immobility. Then he turned to me and said, "I'm thinking of Wiener's 'Cybernetics.' It tends to substantiate you." A moment more of silence then, "All right. I hold that you can define a human being as a mechanical device. This is a mechanical case, and so you can have a generic

claim. But when you write your amendment please mention 'Cybernetics' so the record will be complete."

"All right," I said dubiously. "It seems like a strange thing to put into the record in an amendment, but if you want it I will."

"Nothing strange about it," said Krome. "You should see some of the things attorneys cite in the record. I've had them quote 'Alice in Wonderland' to me." He shook his head and a faraway look came into his eyes. "Then there's the Constitution. Attorneys are forever quoting the Constitution. They don't seem to realize that the Supreme Court has rewritten the Constitution at least three times over. Oh, well. Where were we? Oh, yes. This is a mechanical case so you can have a broad claim. Now. In writing the product-by-process claim, let us consider that the exact point of invention lies in the fetus just as it is severed from its nutrients, and while it is still subjected to supersonic sound. Right?"

"Right."

"So we can call your product a 'vibrating human—' Oops. We agreed that it would be broader than 'human.' A 'vibrating being.' How's that?"

My mind raced over all the things Spardleton had taught me. Broaden it. Don't be limited. That word "being" had me worried somehow. I put my imagination to work. Suddenly it flashed through my mind. "Instead of 'vibrating being,'" I suggested. "How about 'agitated biological entity'?"

Krome gave me a surprised glance, then thought about it for a moment. "That seems all right. You seem to have a facility for this sort of thing. All right. We'll start the claim, 'An agitated biological entity.' Now let's work out the process portion of it."

The next half hour passed in a kind of blur. Krome suggested phrases and I either accepted them or suggested counter-phrases. I remember suggesting "manifestations" instead of "waves." I remember putting in "biological-forming" instead of "zoögenetic." But I was never sure of where we were in the claim. Nor was I absolutely certain of what we were saying in it. But finally we were finished and Krome read it aloud:

"We claim:

I. An agitated biological entity formed by the steps comprising subjecting an agglomeration of biological-forming ingredients to the influence of high-level vibratory manifestations above the frequency detectable by the human ear, whereby said ingredients interact together to produce said entity.

"Good," said Krome. "I will allow that claim, as presently advised. Of course I haven't made an interference search yet, but in any case the claim is allowable. You can work out the sub-generic and species claims all

right and submit them with the proper amendment." He folded up his copy of the case, and continued, "A very fruitful and pleasant interview, Mr. Saddle. Good-by, now."

I think I shook his hand and said something. I know I gathered up all my papers because they were all together later. But my head buzzed. I was dying to get back to the office and read that claim; I wanted to see if my eyes told me the same thing as my ears. I had the feeling Spardleton would congratulate me but I wasn't sure what for. I mumbled some of the phrases over and over again as I left. I was concentrating so hard my eyes were staring. But all I recall about my walk back to my office was that people shrank away from me as I passed.

THE END

THE ANALYTICAL LABORATORY

Many of you, who write in letters or cards voting on the stories, wish I'd reply; it's natural and understandable—no one likes talking into an apparent vacuum. Radio performers get used to it, but it is not truly satisfying. My desire for your letters is, itself, a manifestation of that human wish to know there is a listener, not merely empty space.

But mass communication media introduce a great difficulty; if each of you who read did write me a letter, I'd be overwhelmed with a mass of mail I couldn't read in the course of a month. If only ten of you wrote letters in, the results would be statistically meaningless, however personally cogent and thoughtful they might be. A balance between too much and too little is essential.

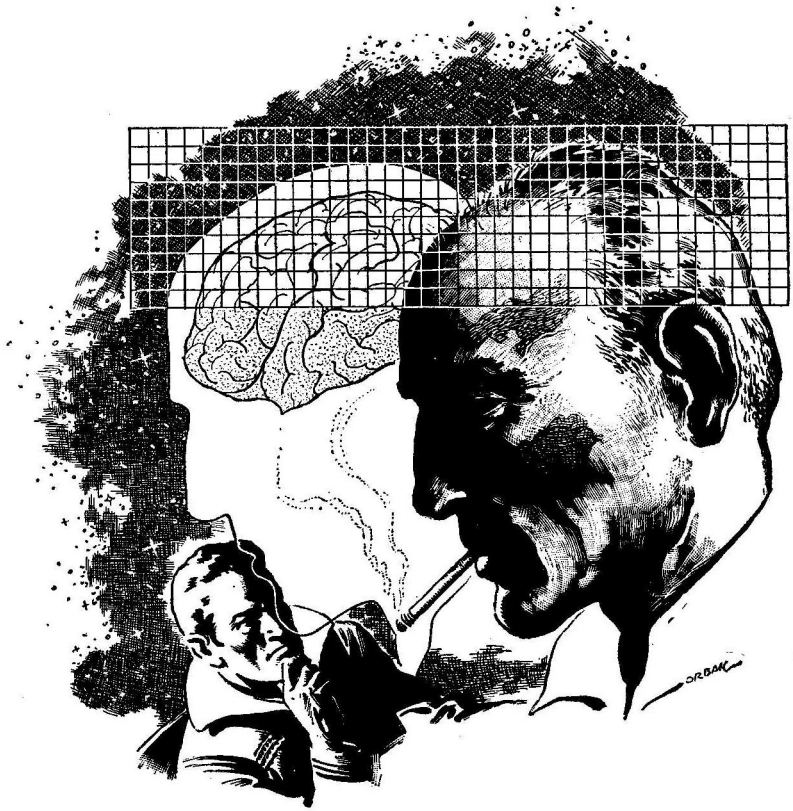
In answering your letters, the situation applies too; I can reply directly to no more than a sample of the mail received, or I'll have no time to do the job required to maintain the magazine. Brass Tacks is part of the answering mechanism; direct letters is another. Naturally, it would be fun for both letter-writer and for me if we could discuss the comments—but neither of us can afford the convention hall that would take!

I can only assure you that every letter received is read, and genuinely considered. They're important to me, you know! But I simply can't answer all of them.

Here's your decision on the October 1953 issue:

Place	*Story*	*Author*	*Points*
1.	THE GULF BETWEEN	Tom Godwin	1.66
2.	BELIEF	Isaac Asimov	2.44
3.	THE SCAVENGERS	James White	2.55
4.	THE TEST	Ralph Williams	3.33

THE EDITOR.



A. I. D.

BY ALGIS BUDRYS

A bit of consideration as to the nature of the ideal anti-interrogation device suggests some remarkable characteristics would be needed. But even the Eglis intelligence officer missed one!

Illustrated by Orban

AID: Anti-Interrogation Device.
Organic servomechanism.
Standard equipment, all personne', all branches, Terrestrial Union Armed Services.
Current Mark: IX

UESS *Starraker* broke away from the oncoming elements of the ravaged TSN ship's destroyer screen and flurried into Hyperspace. With all Terrestiral prisoners on board, secured in an empty compartment, the ship turned her course for Eglis, and

began the journey homeward.

In his compartment, Sub-captain Deven looked past Captain Kein's shoulder at the pile of data sheets on his desk. As he stood there, more sheets spilled out of the messenger box to the left of the pile.

"All right, Deven, what have we got so far?" Kein asked, his voice, as always, unconcerned with anything but the solution of the problem at hand.

"Nothing very much, sir. I won't have, until the technicians finish connecting the surveillance equipment in the prison compartment. So far, their course data confirms our original supposition that this is the ship that broke out of the net at Achernar. Since we have previous information that the same ship is the one that succeeded in penetrating the Home System in the first place, it follows that whatever those three prisoners know, particularly since one of them is an officer, will probably contain the information that would have made it possible for the Terrestrials to coordinate their actions with those of the Dissolutionists."

"Eh? What do you know about the Dissolutionists?" Kein's voice was digging.

Deven grimaced slightly with involuntary annoyance before he composed his face into a more suitable expression. "As Counterespionage and Intelligence Officer of this ship, I am frequently in possession of information which would not ordinarily be released to an officer of my rank and grade. I have known for some time that there is an insurrection on the other side of the Home System. I have not transmitted this information to anyone else, nor do I intend to. This is no more than was expected of me when I was trained for this commission."

He could not help feeling a certain satisfaction as Kein grudgingly accepted the fact.

There's little enough to brighten up this berth, he reflected, his somber, carefully schooled face betraying none of this. Kein was a combat officer by nature and inclination. Within the framework of his orders as he received them, the man operated efficiently and resourcefully, without thought to ultimate principles or larger issues. Perhaps he was not so organized when away from his duty. Deven had no way of knowing or guessing. He had never seen him under such circumstances, and doubted if he ever would.

The other ship's officers were cut to more or less the same pattern. Some bordered on the fanatical, others were more deliberate and calculated in their thoughts and actions. There was Emer, but the PsychoWar Officer was as remote in his thinking, in his own specialized way, as the others.

"Nothing else?" Kein broke in on his reflection.

"Not for the present, sir. Once the surveillance equipment has been wired in to my analyzers, and I've gotten

enough preliminary data, I'll attempt to interrogate the prisoners."

Kein frowned, his heavy brows drawing together. "Can't be done," he grunted.

Deven nodded, but shrugged. "No harm in trying," he said.

"As you wish," Kein said. "Nothing better to do, I suppose."

"No, sir," Deven said with a hidden half-smile. Kein walked away, his heels striking loudly on the deck composition.

Deven went to his desk and his data sheets, a clamp-light shining down from beside him, his forehead drawn. The Terrestrial ship had been carrying information which, if received by the TSN, would have meant a decided shift in the way the war was going. The progress of that information now had been cut off—so it was up to him to try and extract as much as he could from the three captured Terrans. Their ship, by raiding the transport routes into the Home System, had chanced across the news about the Dissolutionist Secession, which was drawing ships and men from the war. One of the Terrans was an officer. Perhaps, locked away somewhere in his brain, there was information which might be just as valuable to Eglis.

His frown deepened as he integrated more and more of the information plucked from the Terrestrial ship and embodied in the various separate reports. But, even as he frowned with concentration, another part of him was ready to bring forth an anticipatory smile.

Kein had been right. On the face of it, it was impossible to interrogate Terrestrials. No one had ever done it. But Deven was a brilliant man—the youngest of his rank in the United Eglin Spatial Fleet. He genuinely liked matching his wits against someone who knew something that UESF, too, wanted to know. It did not, in the final analysis, matter in the slightest what that secret might be—or even that UESF would know it after it had come through him. To Deven, the game itself was what counted. It was his function in the war.

What about after the war? he thought as he worked. What then, when the lucky chronological chance that gave him this opportunity had passed? Occupation duty in the remains of the Terrestrial Union? Would it still be the same, when the stakes were so much smaller, when, for every opponent of genuine intelligence, he would face a thousand hole-and-corner wineshop conspirators?

Occupation duty? Was he so sure the war would end with Eglin victory? Not for the first time, he realized that there was no deep-seated emotional response to the question. There was the matter of personal inconvenience, certainly. But he did not, as Kein would have, react indignantly, even within himself, nor, as Emer would

have done—had he perceived the attitude in someone else—did he proceed to analyze the workings of his psyche.

A technician's call on the phone interrupted his thinking. The audiovisual pickups and other detectors had been wired into the compartment where the prisoners were held, and were now connected to the leads in his desk. He acknowledged the information, reflecting once again on the fact that very few circumstantial obstacles to the performance of his duty were actually annoying to him. The *Starraker*, for instance, had never been equipped with full-dress facilities for prisoner interrogation. No one had ever expected her to need them. Very well, he had been able to operate without them, and now had been content to wait until a jury-rigged approximation could be provided.

He cut in the audiovisual.

There were three prisoners, as he had known. Of the two crewmen, one was lying face-down in a corner, his back badly burned. Deven's face twisted with annoyance. The man's spinal cord and kidneys might be injured. If so, then he had better be questioned soon, if at all.

The other crewman was propped up against a bulkhead, smoking a cigarette. One of his calves had been burned, but he was otherwise unharmed. Deven picked up a microphone.

"Prisoners will refrain from smoking except during normal rest periods. Smoking overloads the atmospheric purifiers. We must remind the prisoners that Eglin oxygenation systems were *not* designed with foreign vices in mind."

The crewman displayed a definitely belligerant attitude. He took several defiant puffs before he ground the butt into the deck.

Deven's lips fell into a slight smile. There would be none of the "Come, now, you and I are just pawns in a game of interstellar chess" approach here.

The officer was a different matter. He lay on his blanket, his face up to the ceiling. Deven cut to a camera over his head, and saw that the man had been blinded by an otherwise superficial burn across his face. Deven's own face twitched.

But, there was the key. The officer was not even attempting to exercise any authority over the crewman—who should have been reprimanded, if only for the benefit of the obvious watcher. So far as it was possible to tell, no attempt had been made to organize the three prisoners into a cohesive unit. Therefore, the officer, for one reason or the other, was unable to take the initiative.

Deven considered the problem for a moment, then pulled the wall phone from its bracket.

"C and I. Get me PsychoWar," he said, meanwhile leafing through the stack of sheets on his desk.

"PsychoWar."

"Emer? Deven. What's the latest line of guff the Terries've been feeding their people? Are they still fighting Interstellar Aggression, or has it been shifted to a personalized hatred for Eglins and Eglis?"

"Still using the 'principles and human rights must be upheld' business, as far as I know. One approach is as realistic as the other, I guess. Why?"

Deven hesitated. "I don't know, exactly—not enough data yet. How hostile to my presence would one of the captured Terries be?"

"Hm-m-m. For interrogation, eh? Officer or crew?"

"Either."

"You'd get farther with the officer, I think." This time, it was the PsychoWar officer who hesitated. "I don't see much point to it, frankly. If you're interested in . . . what is it, baseball? . . . schedules, or gossip about their various home towns, fine, but you're not. And you're certainly not going to get anything else. They've got this gimmick—"

"I know all about the gimmick," Deven said. "It operates exactly like the kind of thing I'd have designed myself, if I thought we could build one. Those Terries! They're quick with their sciences. But I think I can crack this one. If I'm wrong—well, we haven't lost anything."

"No, I suppose not," Emer said. "You know, this sounds like PsychoWar ought to cut itself a slice."

"No!" Deven said quickly. "This one's all mine. It ought to be fun."

"All right," Emer said. His voice held the restrained note it always carried when he was trying not to give away too much of his personal reactions. "I wish you'd stop regarding this war as a fascinating contest between yourself and some phantom opposite number on the Terrie side, though."

Deven chuckled. "As far as I'm concerned, that's exactly what it is. Larger issues? I'm aware of them—but they're far too complex for accurate analysis. Whoever heard of an accurate contemporary evaluation of an historical trend? Maybe the Terries are destined to rule the galaxy in our place—and maybe they're not. That's for some deity to become ulcerous about. Patriotism? Atrocity stories? Interstellar Vengeance? I've read too many books, Emer, and gone too far inside the petty motivations that make men do the fundamentally useless things they do. Instill the fighting spirit in the crewmen, Emer. An efficient officer adopts the attitude best suited to his work. He's an officer because he can function on brains, not some emotional drive."

Emer sighed and hung up. Deven put his own phone back on the bracket, smiling as he did so. He enjoyed digging his heels into the PsychoWar officer occasionally. Emer was very vulnerable. Being just as capable in his line as Deven was in his, he knew, but

couldn't admit, that the C&I Officer was right.

He cut back into the analysis circuits on the prisoners, and found what he had expected. They were behaving exactly as three similarly situated Eglins would have been—except that their respiration, blood pressure, heartbeat, and body temperatures were strictly normal for the physical conditions prevailing. The Terrans showed not the slightest sign of tension, apprehension, or fear.

Wilben, the Terrestrial officer, sat in his chair opposite Deven's desk. His ravaged face had been treated by a medical technician who had worked silently while Deven gave directions in a calm, but audibly concerned, voice. In fact, Deven had seen to it—conspicuously, perhaps, but seen to it nevertheless—that Wilben was comfortable, and, for the first time since the lifecraft fished him out of space, had some assurance of the fact that there were hands to help him, eyes to guide his future course.

Wilben was not good officer material. Deven had found out soon enough that he had been the TSN ship's Mess Officer. He liked to talk. His bewilderment increased his natural propensities along this line. His past was an open book to Deven—along with his hopes, fears, and aspirations.

But his name was Charles Wilben, Lieutenant (JG) TSNR, BUSPAC 02651-T-29, and as far as military information was concerned, that was all.

Deven stifled a sigh and opened a drawer. "Cigarette, Chuck?"

"Thanks," the officer said, and puffed on it gratefully. "They say smoking's no good if you don't see the smoke," he observed after a moment. "Psychological, or something." He chuckled bravely. "Seems all right to me, though. Guess I'm a real slave to nicotine, yes sir!"

"Guess so," Deven agreed, laughing comfortably. In his perverse way, he was enjoying even this frustration. "Funny habit, smoking," he said casually. "No parallel on Eglis. Odd how two races can be so similar, even in general psychological make-up, and still be so different in details. I understand that Eglis and Earth even look generally alike—about the same land-water ratio, and everything else. I've seen maps and models of Earth, of course, but I've never been there. What's it like—from an Earthman's point of view? What's the country like, where you were born? Rural, metropolitan, suburban, what? What do you remember best about Earth?"

"I—" There was a halt. Then Wilben murmured in a monotone. "Was about to say something which would have involved information I subconsciously decided to be of military importance." He stopped again. "Sorry," he added in his normally inflected voice.

Deven shook his head sharply in exasperation—and smiled simultaneously at the fact that the rules of this particular game allowed him this usually repressed outward expression.

He leaned back, shifting his weight enough so that the chair's inclining rachet slipped a notch, and let him assume a more relaxed position.

Well, what did I expect? he said to himself ruefully. A device which prevented the interrogation of captured personnel would naturally:

(A) Not prevent the subject from furnishing any nonconsequential information.

(B) Would be one hundred per cent effective in cutting off the flow of information before even vague hints of any other nature could be elicited from the subject under interrogation.

The specifications were his own. It struck a responsive spark in him to see that the Terrestrials had paralleled them exactly. *More's the luck*, he thought, *they actually found out how to do it.* He'd seen the laconic official catalogue entry. Organic servomechanism, eh? And what was that supposed to mean? Some kind of impression on the brain-paths, most likely. A complicated and interlaced pattern, with high discriminatory powers borrowed, no doubt, from the subject's own subconscious. Hypnosis of some kind? And what about that discrimination? How did the device distinguish between foe and a friend qualified to have the information passed to him?

Well, he'd have to try the hypnosis angle.

Four hours later, Deven had established that "organic servomechanism" either meant something other than a posthypnotic suggestion, or else a hypnosis so firmly—in fact, almost viciously—implanted that his own best efforts were useless.

He stopped and caught his lower lip between his teeth. What now? The sodiae? He shook his head. Under specification (B) came subspecification:

(1) Would remain operative even, and especially, when the subject was not otherwise conscious; i.e., asleep, in shock, or under sedation, anesthesia, or other drugging.

The phone buzzed and he took it, somewhat grateful for the interruption. He listened for a moment, then permitted himself a sharply hurled curse. He caught himself rapidly. Wilben was conscious, and had heard his reaction. Deven put even that to use.

Audibly simmering, he let a mutter about stupidity escape him. Then, his voice apologetic, he turned to the bewildered officer.

"I'm sorry—very sorry. I've just been informed that the badly injured crewman died—and that the other one was killed when he resisted a detail that was sent to remove the body."

Pressure, he thought. *He's the only one left. It's going to be a lonely and miserable life. Blind. So far away from home and help.* If he could strike deeper into the subconscious than the device—

He pictured the processes of the TSN officer's mind. There was no hope, now. No chance of escape—and not even the comfort of companionship. Already, the multiplied fear of the dark and of helplessness were striking deep at the roots of the man's thinking. Now there was loneliness, as well. *The basics. Attack along the basics. Strike at his childhood fears. Get to him* before *the device was put into his mind.*

"I . . . I don't know—" the officer said helplessly.

That's it! His mind pounced ruthlessly, but his voice showed none of that. "If there's anything I could do—You understand that the man in charge of the detail had no orders. The action was unpremeditated—" He mouthed a series of apologies. Then:

"You understand, of course, that this ship is manned by a crew geared to thinking of Earthmen as deadly enemies. There's only so much I can personally do. But if you were to cooperate, why then—" Crude. Crude, and probably purposeless. What cosmic secrets could be held in *that* brain? But the game—to break the Terran device. Crude—but good enough for this frightened man.

He watched the sweat break out in the officer's palms with satisfaction. The man's posture and nervous squirming were as indicative as signboards. Any conditioning the TSN might have given him could not circumvent this overwhelming appeal to basics that had been irrevocably established before he was out of his crib.

Wilben cracked. There was no special additional outward sign, but Deven's infallible instincts told him the barriers were down. He leaned forward.

Wilben slumped sideward, dead.

Deven straightened up, slapping his open palm against his knee.

(C) This device would not be injurious to personnel, up to a point. Provision would have to be made for the stage at which death might be the only means to continue the evasion of questioning.

Abruptly, Deven spun on his heel and picked up the telephone again. "C and I. Get your burial detail down here," he snapped into it, then marched out of the compartment and strode up to the bridge.

Captain Kein had no warning. Deven burned him down, and the crewmen on watch as well. Moving swiftly, he set the ship's automatics and then ran out of the control room, getting to the lifecraft cradle just as the ship snapped out into Space Prime. He was out and well clear of the plunging ship when the automatics flicked her back into Hyperspace again.

The lifecraft was stocked with food and water for fifteen men for thirty days. There were the usual boredom-interrupting devices. He set a course he knew would be intercepted by a TSN ship, put the proper recognition signal on the peripheral field, and waited.

He was plagued by no self-accusations of treachery. War was a chess game, containing within its macrocosm the microscopic games played by its participants. He had resigned, for good and logical reason. If a war could be initiated for the cold-blooded purpose of establishing spheres of influence, of gaining control of mineral resources or trade routes, or whatever the reason had been—even if this politicoeconomic motivation *was* concealed behind impressive slogans and stirring propaganda—then, ultimately, he was certainly justified in just as cold-bloodedly taking whatever decisive steps he saw fit.

He said as much to the TSN Intelligence Officer. He sat in a comfortable chair on the opposite side of the officer's desk—where Wilben had sat, aboard the *Starraker*, he remembered. He smiled inwardly at the parallel.

And here is my phantom opposite number, he thought, studying the TSN Intelligence man. The officer was older than he was. Short bristles of gray stood out in the black hair above his ears. His lips were framed by deeply etched lines on his cheeks, and his gray eyes were brooding, and somehow cold.

Poor technique, Deven thought. *Negates any other overtures of friendship.*

"You mentioned an insurrection, I think," the TSN man said.

Deven nodded amiably. "Yes," he said. "I should estimate that, at its height, the rebellion will draw off at least twenty per cent of the forces currently being employed against you. This peak will be reached in about one hundred GST days. At this time, a properly directed attack here"—he pointed out sectors and co-ordinates on the star map with incisive slashes of his hand—"should enable you to split the fleet into four isolated fragments. After that, of course, you can probably demand a treaty. Or, if you prefer, you can cut up the individual segments at your leisure."

He stopped, and heaved a sigh of relief.

"Anything else?" the officer asked.

Too cold. The voice should be warmer, Deven criticized to himself. These Earthmen, though—all alike. All machinelike—or, rather, like men dealing with a mechanism.

I am still a personification of the enemy to them, he realized. The fact that he had given them the key to victory counted for nothing in his favor. He shrugged.

"Tell me," the TSN man said, "as one professional to another"—*Ah*, that's *better*, Deven thought—"what was your experience with the Mark

IX AID? You were unsuccessful in circumventing it."

"Most effective," Deven said. "Within its present limitations, of course."

"Oh?" The TSN officer's eyebrows were up.

"Certainly." Deven smiled. "Of course, even Earthmen can't be expected to pull a perfected device out of the hat every time. I imagine you'll improve on the current design. But, as it stands, the device fights only half the battle. The concealment of information is important, true—I might say, paramount under most circumstances. But, in a case such as we had here, where the subject was in the possession of previously unknown information, that information would ordinarily never have reached Earth. As a last resort, the device kills—and the information is lost."

The TSN officer's composure broke. "Then you're still under the impression that you deserted of your own volition? Excellent!" His voice was first incredulous, then exultant. "I've argued the hypothetical case many times!"

Deven, felt his forehead and the skin around his eyes wrinkling as he stared intently at the officer.

"WHAT?"

"Of course, man!" The officer's expression as he looked at Deven was that of one professional for another he has just defeated. "You said yourself you'd specified your own version of the AID. Obviously, specification (D) must be:

> In an emergency, or on the point of the subject's death, it might also be possible to record newly-acquired and significant information, or to transmit it by some means. In addition, it will be necessary to transmit all normal classified information to the subject's successor. Therefore, the ideal form for this device would be that of a semi-individualistic, discriminatory entity, in motile symbiotic link with the subject and succeeding subject(s)."

Deven kicked his chair back. Somewhere within him, he felt the words of professional admiration beginning to form at the verbal level. But he was, at bottom, a humanoid being. Snarling, he died fighting.

THE END

☆ ☆ ☆ ☆ ☆

BERTHA

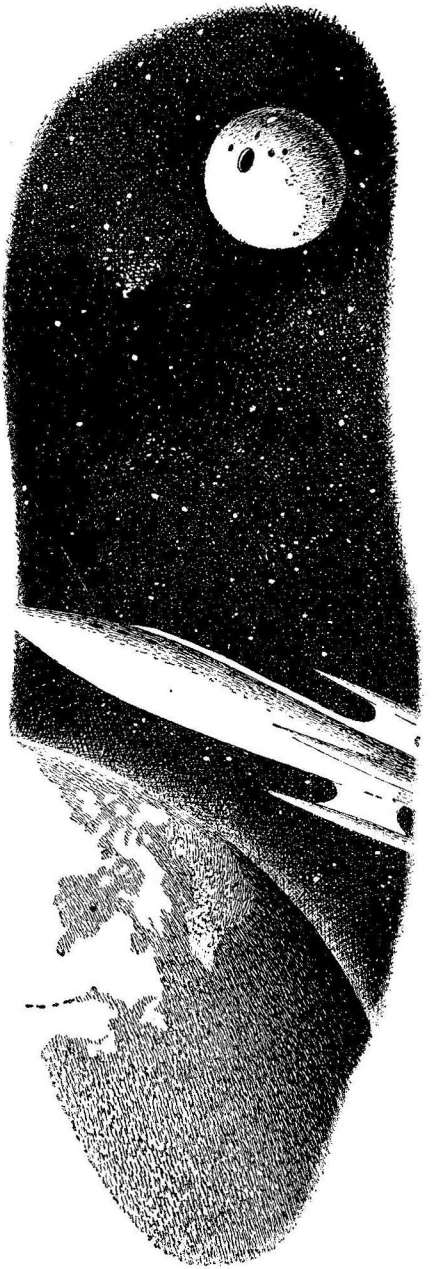
BY RALPH WILLIAMS

***When** is a spaceship not a spaceship? Or an orbital station not an orbital station? When the builders have somewhat more patience, a longer viewpoint, than suspected . . .*

The thing in the sky circled unobserved about the Earth. It may have just been there, as the Moon is there, and as stars are there. Or it may have been waiting.

Below in New Mexico, men prepared to launch the first manned rocket —

Human reactions were designed to be precise enough to guide a stone hatchet, and fast enough to dodge the blow of the cave bear. They have neither the speed nor delicacy to control seven thousand tons of rocketship



Illustrated by van Dongen

leaving the Earth at nine gravities acceleration. During the take-off, the three men of the crew lay in their acceleration couches, as helpless as the mice that had preceded them, while the rocket piloted itself.

Tiny steel teeth gnawed stolidly and harmlessly at a tape, springing back weakly when they met resistance, transforming the punched patterns in the tape into electrical impulses which activated various relays. The perforated tape gave commands: "Do this and then do that, and if so-and-so happens, then do thus—"; and the activated relays denoted acceptance and readiness to perform these commands. A certain altitude was reached and the ship, knowing this, altered its course to the east as instructed by the tape. The first stage was dropped, as the tape directed, at the exact instant the last few drops of fuel in its tanks were exhausted, and then the second. A few minutes later, the ship realized it had attained the goal set by the tape. With a final triumphant clacking of relays, it shut off the engine.

The human crew, unlike the mice, were not along just as passengers. They now took over, devising new tasks for the machines. McKay, moving clumsily without the accustomed restraint of gravity, and feeling an inward queasiness which became acute when he moved his eyes suddenly, took sights on the stars and on landmarks on the Earth below. He compared these with an artificial horizon perpendicular to a line joining the rocket and the center of the Earth's image, and an azimuth defined by the rocket's line of motion. Brown pushed switches which activated small flywheels to turn the ship. Goodrich, the captain, performed further calculations on the navigator's figures, and from these prepared another tape which he fed into the autopilot. By the time this was done, it was a few minutes less than an hour after take-off time, and the ship was halfway around the globe from its point of departure.

At the proper moment, the captain tripped the firing switch.

The engine caught with a *whoosh*, slamming the men back into their couches, and the autopilot nibbled precisely at the tape, clucking abstractedly to itself. After seventeen seconds it shut off the engine again. The rocket was now in a roughly circular orbit, a little over five thousand miles from the Earth's center, one thousand miles above its surface.

The other thing in the sky was now only five hundred miles above them; but the men in the rocketship did not know this, and might not have cared if they had known. They were busy with a more urgent problem.

The weightlessness, sudden heavy acceleration, and weightlessness again had been too much for Brown. He was suddenly and violently sick, groping blindly for a container. Goodrich thrust it against the man's face. A

moment later, watching his second officer's heaving shoulders with mingled disgust and sympathy, he became aware that he did not feel very well himself. He reached for another container. The navigator followed suit.

The rocket swung precisely in its orbit a thousand miles above the Earth, shining immaculately with clean sweeping lines and polished steel surfaces exact to thousandths of an inch. Inside, its builders and masters gagged and spewed and rolled weakly against their restraining harness, like blind brainless animals, heedless of anything but the spasms in their bowels. Vomit splattered on glittering precision instruments.

After a while, the convulsions began to wear themselves out. The men wiped at their streaming eyes and slimy faces. Goodrich saw that they had almost circled the Earth, their take-off point was coming up over the horizon. There was a tinny squeaking in his headphones. He switched on the speaker.

"Rubberneck, this is Thumbtack," the radio was saying urgently. "Rubberneck, Rubberneck, Thumbtack calling. Do you hear me? Is something wrong? Rubberneck, this is Thumbtack. Give us a count, over."

Goodrich spat, wiped his mouth, and plugged in his mike. "Thumbtack Control, Rubberneck," he said. "Do you hear me now?"

"I hear you fine now. Is everything O.K.?"

"O.K. now," Goodrich said. He paused. "We were sick," he said reluctantly. "O.K. now."

"Roger." There was a long pause. "Did you know you were off course? We have you about twenty minutes ahead of schedule and thirty degrees off course. Also too high. We've been trying to get you for twenty minutes, since we got your first track."

"Roger, wait." Goodrich turned to McKay. The navigator had unstrapped his upper body and was sitting up to listen. He shook his head negatively and pointed at the forward view screen. The coast of California stood clear and sharp ahead of them, but New Mexico was still only a thin line on the horizon. Goodrich nodded. "Get a fix," he said.

He clicked the mike switch. "Thumbtack, Rubberneck. There must be a mistake. We're just coming up over the visual horizon now, on course as nearly as we can tell."

"Roger. Well, we have a good track on you, I don't see how we could be mistaken—" the voice broke off. "Just a minute," it said presently. "I think we're getting another track now . . . that's it, we've got you O.K. now, right on course. The first track was a bogey." There was another pause. "Mr. Welsh wants to talk to you now."

Welsh was the project engineer. For several minutes Goodrich answered his technical questions about the operation of the rocket. The crew

began to settle back into their work. The nausea induced by abrupt changes in orientation does not kill people, however uncomfortable it may make them, and there were things to be done. McKay completed three fixes which Goodrich relayed to the control station. The ground radar was not accurate enough for course computation, and these fixes were necessary for the final adjustments to their orbit. Brown, hiccuping now and then, began to clean up the mess.

They were almost over the station now, the Earth spinning westward beneath them. In their two-hour orbit, another twenty minutes would take them out of radio range.

"How about our final course correction data?" Goodrich asked. "Have you got that worked up yet?"

"Just a minute," Welsh said. "I'll check."

The minute stretched out. "Thumbtack, Rubberneck," Goodrich said. "You still there?"

"Thumbtack," the operator's voice said. "Wait. They're working on a new angle here. We'll have something for you in just a minute."

Goodrich waited, wondering vaguely what the new angle was. Rubberneck had been planned down to the last second for six months now, and so far had cost a little over a billion dollars. A major change at this time seemed unlikely. The worst of his nausea was gone, but it had left him feeling limp and beat-up, and not too bright. Get this last course correction made, he thought, and we can relax for a little while, by the time we come around again we should be in better shape.

A new voice came on the radio. "Goodrich?" it asked.

"This is Goodrich."

"Captain Bartell here. We're going to have to change your course, want you to vector in on that bogey. Think you can do it?"

"Bogey?" Goodrich asked stupidly. "What bogey?"

The radio voice held more than a hint of impatience. "That unidentified orbital track we got just before we picked you up. Didn't the operator report it to you?"

Goodrich tried to think. "Well, yes, sir. I guess he did. I didn't know it was orbital, though."

"Well, it was. We have to get a look at that thing, this is more important than Rubberneck. It may change our whole planning on Highjump. You understand that, don't you?"

Goodrich did understand. Highjump—the satellite project—was the big thing, Rubberneck was only initial reconnaissance. If there was another satellite already up—

"Yes, sir," he said. "I see. We'll do what we can. We hadn't planned any major maneuvers, though. How about fuel?"

"You'll have enough. We grossed you out on fuel, since you wouldn't be carrying cargo this trip, and we

wanted a good safety factor till we had a chance to check fuel consumption figures. Mr. Welsh says you've been staying well within limits, and we've already run an intercept course for you, it looks like you'll have enough for this maneuver and a good landing reserve left.

"In any event, your landing reserve isn't important. I want you to close with this thing . . . uh, let's see, let's call it 'Bertha' . . . I want you to close with Bertha and make an identification, even if you have to burn your last drop and sit up there until we get up and bring you back down. Do you have that?"

"Roger. I'm to close and identify Bertha, without regard to secondary considerations."

"Don't repeat back, Rubberneck," Bartell said sharply. "We're beaming at you from this end, but all North America can hear what *you* say. O.K., now here's what you're to do. We're going to vector you in on Bertha. Close to visual range. We get a good sharp return on this thing, but it may be physically quite small, and possibly it's a natural satellite no one ever happened to notice. If it is, we need it. Make fast to it, go aboard and establish possession . . . put down some sort of marker, that is, and get pictures. Get as much data as you can as to size, composition, et cetera, and report . . . let's see, make that report: 'Bertha condition Able.' Do you have that? 'Bertha condition Able.' Now acknowledge."

Goodrich printed carefully on his log: *nat sat—Able.* "Rubberneck, Roger," he said.

"Good. Now there's a chance it may not be natural, it may be an artificial satellite. Our intelligence is good, but it isn't perfect, and it's just possible somebody has beat us to the punch. If so, we want to know who. Use discretion here, try to avoid observation, and above all don't provoke an incident; but make positive identification if at all possible, and get all you can in the way of pictures, stuff like that. If it's you-know-who's, report: 'Bertha condition Dog.' I say again, 'Dog.'

"On the other hand, if it's artificial but unidentifiable, make it 'King.' Unidentifiable, 'King.' Friendly, 'Mike.' I say again, friendly, 'Mike.' Artificial but probably extraterrestrial, 'Zebra.' Extraterrestrial, 'Zebra.' Do you have all that? Acknowledge."

"Rubberneck, Roger," Goodrich said.

"One more thing. If you're fired on, report: 'Baker.' Take evasive action, draw as much fire as possible without endangering your mission, and try to keep contact until further advised. Now here's Mr. Welsh with your new firing data. Good luck, boy."

"Roger," Goodrich said.

McKay and Brown had been listening wide-eyed.

"Well," McKay said. "You think

there's really something there, or have they just got us chasing flying saucers?"

"I don't know, but I don't think I like it," Brown said. "You know what that means when they say: 'Good luck, boy.' That means you better check and see if your beneficiary is current."

Goodrich flipped an impatient hand at them. "Break it off," he said. "You can figure it all out later. Now give me a hand to copy this stuff, we'll be out of range in a minute." He snapped the mike switch. "Go ahead, Thumbtack," he said. "We're ready to copy."

The first power maneuver did not put them close enough to make visual identification. They picked up Bertha as a faint point of light below and somewhat behind them, but without radar of their own they had no way of knowing exactly how far away. The control station gave them new firing data and they fired again, for only a few seconds this time. The new maneuver put them in easy visual contact.

The satellite was artificial.

The men studied it wordlessly. It did not look like the product of an Earthly technology, Goodrich thought, although he could assign no specific reason for this feeling. Apparently spherical, and about the size of a dime on the view screen without magnification, it might have been ten feet across and a few hundred yards away, or a hundred feet and a mile. They seemed to be below and somewhat behind it, but overtaking, the relative bearing changing by about one degree per minute. There were hints of hatches or ports on its surface, and various protuberances which might have been antenna or telescopic gear.

Or, Goodrich thought, *if it was extraterrestrial, they might even be weapons, the strange unguessable weapons of science fiction.*

"O.K." he said. "Let's get to work here. Swing the ship and get the nose camera working." He turned to his perforator. "How do you set up an evasive course on a rocket?" he asked McKay. "You got any ideas?"

The navigator shrugged. "We can't zigzag, all we can do is go in the direction we're pointed. I'd say, since we want to use the nose camera anyway, just point her a couple degrees off a collision course and set up a tape with random accelerations, that should foul up their firing data some, and if they're looking this way, we could be past and gone the other way before they could swing on us—maybe."

"Yeah, maybe," Goodrich said. "All they have to do is be ready to catch us going away on the other side, if they can see us at all they can see which way we're pointed." He scratched thoughtfully at his chin. "Well, I guess that's the best we can do, though. When they built this

thing, they didn't think we'd have to fight anybody with it, just get up here was all they were thinking about." He punched a tape and fed it into the auto pilot and sat with his thumb on the firing switch, watching the satellite.

The control station was sliding over the horizon behind them now, they would soon lose contact. He had better report what they had, he thought, in case they were not there when they came around again. But what *did* they have? King, or Zebra? Well, there was no evidence, really, only a feeling—

"Thumbtack, this is Rubberneck," he said. "Visual contact. Bertha condition King. I say again, Bertha condition King. Over."

The answer came faintly but promptly. "Thumbtack, Roger. Maintain contact and continue to investigate. Acknowledge."

"Rubberneck, Roger. Out."

Bertha was abeam them now, relative to Earth. Goodrich gave thought to the problem of fixing its range and relative velocity.

"Get me a couple of timed fixes on Bertha, Mac," he said.

"How about the pictures? I'll have to swing the ship."

"Let the pictures go, for now, we've got a few. Get the fixes and then swing the ship to one eighty azimuth, zero inclination. I'm going to fire a three foot-second blast and see what happens." He punched a new tape for the evasive action, keeping a wary eye on the sphere, with a runner on the front end for the three foot-second blast. If their move provoked Bertha to action, all he had to do was trip the switch again and keep right on going.

"O.K. on the fixes," McKay said. He juggled the flywheel controls and the ship swung gently about. He took another observation. "One eighty azimuth, zero inclination, on heading," he said. "Ready to fire."

Goodrich punched the firing switch once. There was a single sharp jolt.

"Now get me range and speed," he said. He studied the sphere narrowly, thumb on the firing switch. It spun slowly, oblivious to their activity.

"I make it twelve hundred yards range, about one foot-second relative velocity now," McKay said.

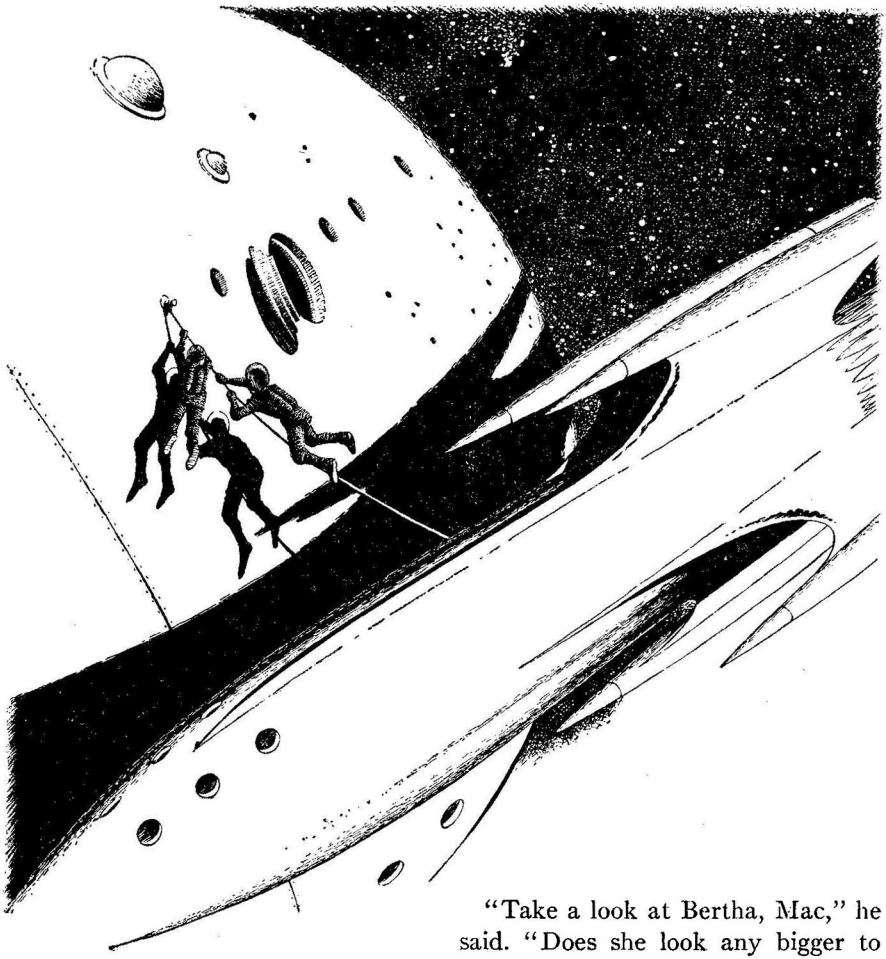
"O.K." Goodrich rubbed at his chin. Twelve hundred yards range made Bertha's diameter around eighty feet. Big. There could be a lot inside a sphere that size.

He glanced down at the Earth. The North Atlantic seaboard beneath them was dark now, they would be in the shadow in a few more minutes.

"O.K." he said. "Let's get a few more pictures while we can."

They swung the ship again to bring the nose camera to bear and took pictures until they swung into the shadow.

"Secure the cameras," Goodrich said.



Bertha hidden in darkness for the thirty-six minutes they took to pass through the shadow was not a comfortable companion. Goodrich could make out the sphere at times, as it occluded the stars, and after a while he began to get a panicky feeling it was closing in on him.

"Take a look at Bertha, Mac," he said. "Does she look any bigger to you?"

The navigator studied the screen carefully. "I believe it is," he said slowly. "You know, I think we've got about the same period, but there might be a little eccentricity in our orbit, or theirs. That might swing us in closer."

"That's probably it," Goodrich said. "It does seem to be swinging in

a little closer."

"I just thought of a good joke," Brown said. "Suppose we're on intersecting orbits, a collision course, and they intersect here in the dark Boom."

"We could see it well enough to get out of the way," Goodrich said. Nevertheless, it was an uneasy idea. He watched the screen carefully, measuring with his eye the span between stars obscured by the sphere. The image *was* growing larger, he was sure.

"You know, Mac," he said, "does it strike you funny that we haven't seen a sign of life from that thing? Do you suppose they might not know we're here?"

"Well, no. If it's a satellite, they're probably crammed with radar and optical gear, so it isn't very likely they'd miss us. Just because we can't see anything happening on the outside, that doesn't mean they aren't busy on the inside. They could be tracking and photographing every move we make, and we'd never know it."

"Still, you'd think they'd make some sort of signal, try to establish contact."

"Why? Have we?"

Goodrich blinked. "By golly, that's right," he said. "We've been so busy watching them, we never thought of it." He thought for a moment. "We could use the bow landing light for a blinker, I suppose. Either of you fellows know the international code for 'identify yourselves'?"

"QRA, I think," Brown said. "Interrogatory."

Goodrich manipulated the landing light switch several times. They watched the shadowy sphere for a reply. There was none.

"Maybe the landing light's not working," McKay said. "Turn her on for a minute, I'll swing the ship and see if we get a reflection off Bertha."

The sphere suddenly brightened in the bow screen, dimmed again as they swung past, and then brightened again as McKay centered the beam. It *was* closer, about seven or eight hundred yards, Goodrich guessed.

He worked the switch again, spelling out "QRA?" very slowly—the landing light was not built for this kind of work, and it took an appreciable instant for the filament to brighten and dim. There was no response.

"Maybe she's derelict," Brown said. "You see those little circles? I'm pretty sure those are direct view ports, but I don't see any lights behind them."

"Could be," Goodrich said. "On the other hand, those circles could be television cameras. And maybe they just don't want to talk to us. If it's the Commies, they may want to keep us guessing."

They were more than halfway through the shadow now. For the rest of the time, Goodrich kept the landing light on Bertha. It made him feel better to see the sphere clearly. Oc-

casionally he flashed a signal with the switch. Bertha still gave no sign of life.

When they came out into the sunlight again, Rubberneck was directly ahead of Bertha, leading by about five hundred yards. There was much more detail visible at this range, and the impression of unearthliness was stronger. They went back to their picture-taking.

"Take a look at that little bulge about the middle, just coming into sight," McKay said presently. "What's it look like to you?"

"Which one?" Goodrich asked.

"The one just below that stub mast, or whatever it is, that slants up a little. I've been watching it for a while, it looks like a hatch to me, and it looks like it might be half-open. You can see better when it comes around farther."

"Yeah," Goodrich said, "I see it now." He studied its changing shadow as it swung around and passed from view again. "It does look like it might be a hatch," he admitted.

"I think it *is* a hatch," McKay said positively. "Next time it comes around, watch the shadow when the sun hits at the angle from this side."

The men watched and fed the camera. The sphere hung there. It showed no sign of life. Goodrich kept his thumb on the firing switch. The coast of California showed a thin line on the horizon and grew rapidly into shape below them. Goodrich plugged in his mike.

"Thumbtack, this is Rubberneck," he said. "Do you hear me, over."

"Hear you O.K., Rubberneck. Go ahead."

"Bertha still condition King, possibly Zebra. I say again, possibly Zebra. No sign of life." Goodrich hesitated, considering. There was the open hatch, and they had been in close range for over two hours now, with no sign of recognition of their presence. "May be abandoned," he finally said. "Over."

"Thumbtack, Roger. Wait."

Goodrich waited, watching the sphere, his thumb flexing lightly on the firing switch.

"What is your range to Bertha?" the radio said.

The rocket had drifted back over Bertha and was now behind and a little below.

"Five hundred yards."

"Roger, wait." There was another long pause. "Goodrich? Captain Bartell here. Why do you think Bertha may be abandoned?"

"There's a hatch which seems to be somewhat ajar. Ports, but no lights. No reaction to our maneuvers in the immediate vicinity. No response to light signals."

"I see. Just a minute, Goodrich." Bartell had left his mike open, and Goodrich caught a hint of background argument, one voice speaking positively, another seeming to counter. "Goodrich? Now listen carefully. We have to get more information here, if

this is abandoned it may be the find of the century, but we can't take a chance on bringing Rubberneck any closer. Do you think you can get a man across? I know you're not equipped for it, but it's vitally important that we find out definitely if Bertha is extraterrestrial or not, and if she's abandoned. Think it over carefully and let me know. Over."

"Rubberneck, Roger," Goodrich said. "Wait."

The radio broke in again: "Mr. Welsh says your pressure suits are good for thirty minutes, maybe forty-five with some relatively minor discomfort. And you can use oxygen under pressure for a propellant. Does that help you any?" Before Goodrich could acknowledge, he added: "The Secretary of Defense, Mr. Allen, and Admiral Porter are here in the station. They consider this matter of utmost importance."

"Roger," Goodrich said. "Wait." He looked at Brown. The captain could not leave the ship, and the navigator was of almost equal importance. The second officer was the spare-parts man. "We could drop our pressure and let you out the hatch," Goodrich said. "Bring you back in the same way. I guess these suits are good enough to stand it."

"They're supposed to be," Brown said. "It's different in a decompression chamber, though. If anything goes wrong, they can get you out." He ran his fingers through his hair and stared at the sphere. "I wish we had a line," he said. "If I miss, it's a long way down."

"You don't have to go," Goodrich said. "It's up to you."

"Yeah, I know, I know. What if he starts something when I'm halfway across?"

"We'd have to haul out and leave you."

"That's what I thought . . . well, O.K., I guess. We can't disappoint all that brass. Give me a hand getting fixed up here, will you, Mac?"

"Thumbtack, Rubberneck," Goodrich said into his mike. "We're going to try it."

"Good boy. This won't be forgotten."

"I'll bet it won't," Brown said. "Not by me, anyway. I don't know about them."

He slid his helmet on and secured it to his pressure suit. McKay helped him lash a spare oxygen bottle to his midriff, and two more on his back in such fashion that he could get at them readily, but they would not interfere with his movements. "Take it easy on that oxygen at first, till you get the feel of it," he said. "I don't think you'll need very much push, that's just in case." McKay and Goodrich put on their own helmets. All three plugged into the intercom.

"O.K.," Goodrich said. "I'm going to depressurize now." He felt the pressure suit stiffen and constrict on

his arms and legs. McKay released the hydraulic seal of the hatch and swung it open.

"Here I go," Brown said. "Watch for my hand signals." He pulled himself to the hatch opening and balanced gingerly on its edge, holding himself steady with one hand. He flexed and straightened his legs slowly several times, getting the feel of it, and then let go and jumped strongly away. McKay and Goodrich watched tensely.

The thrust of Brown's legs had not been exactly in line with his center of gravity, and he began to cartwheel slowly. He was also slightly off on his line of flight, it was soon obvious he would miss the sphere, but they could not be sure if he realized this. They could see him twisting his head about and making futile swimming motions with his arms and legs, trying to orient himself. After about a minute he stopped moving and lay quietly. He apparently got his bearings, for they saw him manipulate the oxygen bottle and he began to spin slowly in the opposite direction. He lay quiet for a moment again, then again used the bottle and this time killed almost all his spin. By this time he was a good halfway to his target.

He made no further move until he was almost on the verge of passing the sphere, or so it appeared to Goodrich, and then suddenly his course altered. It was too far to see exactly what he was doing, but he must have used the oxygen bottle again.

McKay spoke for the first time: "I believe the kid's going to make it."

Brown's green-clad figure was sharp now against the white of the sphere. It suddenly exhibited violent activity, to what end was not immediately clear, and then the watchers made out that he had struck the sphere and was sliding over its surface, scrabbling for a handhold.

He found one and lay quiet for a while, and the rotation of the sphere carried him around out of their sight. When he reappeared, they could see that he was cautiously working his way over the surface toward what they had thought might be a hatch.

The radio broke in impatiently: "Rubberneck, this is Thumbtack. Do you have anything to report? Over."

"Thumbtack, Rubberneck," Goodrich said. "We have a man aboard Bertha now. Wait."

Brown reached the hatch and disappeared. Apparently it was open, as they had suspected. For ten minutes nothing happened.

"Rubberneck, this is Thumbtack," the radio said. "Hasn't your man reported yet? Over."

"He can't report," Goodrich said shortly. "No radio. Wait."

Five more minutes went by. Goodrich's hands were getting numb and his belly and chest hurt him. His eyes tended to blur unless he focused carefully.

"We're getting close to the limit on these suits," he said. "If he don't

show up in a few minutes, we're going to have to pressurize."

They were coming around to the terminator again, in another eight minutes they would be in darkness. *If he's not out by then*, Goodrich thought —

"Hey," McKay said suddenly. "I think I saw that hatch move. Yeah, there he is, he's coming out now." Goodrich could see Brown now. He moved out onto the surface and stopped a few feet from the hatch.

"He's making himself fast to that stub mast," McKay said. "I think he's going to signal us." Apparently the navigator's eyes were holding up better than Goodrich's. "He's waving all clear now," McKay said. "By golly, I think he's waving us in. What do you make of it?"

"I can't see," Goodrich said. He thought briefly. "We've got to do something pretty quick. You're sure he's waving us in?"

"It looks that way to me."

"O.K., I'm going to ask permission from Control to go in and pick him up." He switched on his mike. "Thumbtack, this is Rubberneck," he said. "Our man signals all clear, wants us to move in. Request permission to approach Bertha. Over."

"Thumbtack, Roger. Wait."

"Wait, hell! Get on the ball down there!" Goodrich burst out. "We've had thirty minutes in these suits now, we won't last forever."

There was a moment of stunned silence.

"Roger, Rubberneck, use your own discretion."

"Rubberneck, Roger, out." He slapped the switch viciously over to intercom. "O.K., Mac, you'll have to con me in. I can't see well enough to judge distances. I'm not going to fire, going to blow off fuel and let the pump pressure drive us in. Line us up on her now."

The engineer clutched the flywheels in and the ship swung until its nose bore on the sphere. There were manual controls for emergency. Goodrich cut out the autopilot and punched the fuel switch, leaving the ignition off. The ship began to drift toward the sphere.

"O.K.," McKay said. "Cut her now till I turn over."

He swung the ship again until the stern view screen centered on the sphere. His own eyes were giving him trouble now, but they were much closer, he could see the target well enough to center it.

"O.K.," he said. "Now blow again."

Bertha had rotated twice while they were maneuvering, and the hatch was almost directly beneath them. McKay could make out Brown's figure scrambling back inside to get in the clear. The sphere swelled slowly until it filled the whole view screen.

"Cut her!" McKay said. There was a grinding jar as the rocket and the

sphere collided. Goodrich and McKay unbuckled and started to climb out the hatch. They looked up toward the sphere and saw Brown, blue in the face and with blood running from his nose, slithering down over the skin of the rocket. He motioned them violently back and scrambled inside, fumbling to plug into the intercom. McKay helped him.

"Let's get some pressure on this can!" he said through chattering teeth. "Don't worry about the ship, I've got her tied down."

McKay dogged the hatch and the pressure began to come up. "O.K.," Goodrich said. "I guess we can get these helmets off now." McKay helped Brown with his.

"Boy, that was rough," the second officer said. "Next time, somebody else can have it." He lay back on his acceleration couch. "No rush now," he said presently. "Bertha's abandoned, and I've got the ship made fast. There was a tie-down cable fast to a ring by the hatch. I hooked it into one of the second-stage couplings." He stripped off his gloves and stared curiously at his hands. They were a puffy white, mottled by dark blotches where capillaries had broken. Blood oozed from under the fingernails. "I'll bet I'm like that all over," he said.

"I suppose so," Goodrich said. His vision was clearing now, but he felt as if he had been beaten all over his body, very carefully, with a rubber hose. His own fingernails felt as if they had been drawn out with pincers, though they were not bleeding as badly as Brown's.

"What makes you think it's abandoned?" he asked.

"Well, I went in through that hatch, it must be an air lock, there's another hatch just inside, and that's open, too. It gives out onto a sort of corridor. I couldn't see very well in there, there's no light, but I think that corridor runs around the hull like a belt. I felt along it a way, and as near as I could make out it goes on at least halfway around, with doors opening on it. Some of those were open too, the whole thing's wide open, no air. And it just *feels* dead. I came back to the hatch then and banged on the deck a couple of times with that oxygen bottle, didn't get any sign of life at all."

Goodrich frowned. "I don't see it," he said. "Why would anyone put this thing up here, go to all that trouble, and then leave it?"

"I don't think anyone put it up here," Brown said earnestly. "What I mean is, I think it came from another planet. Listen, there were controls in that air lock, I could see pretty well in there, but they were different. You know, you climb in a Jap plane, or a German plane, or a Russian plane, things are different but a wheel is a wheel, a handle is a handle, and a dial has pointers on it and figures, even if they're different figures. This thing, *everything* is different. You take that

tie-down cable by the hatch; it's a tie-down cable all right, you can see that; but it's not laid like a rope, and it's not braided either, it's got scales. Now who ever heard of a steel cable with scales like a snake?"

"You might be right about it being extraterrestrial," Goodrich said. "Myself, I've had that feeling too, ever since we first spotted it." He hesitated. "The trouble is, it still doesn't figure. If it came from another planet, why bring it all that way, and then leave it?"

"Maybe they just finished with it," McKay said. "Maybe they finished whatever work they needed it for, an observation post, say; and just figured it was easier to leave it than to take it back. Or maybe they died. We don't know, that thing might have been here just like that for a couple thousand years, there's nothing here, no weather or anything, to change it."

"I suppose so," Goodrich said. "The thing is, though, we have to try and find out." He glanced at his watch. "We'll have to wait till we get around and contact Control on it, and report. Way it looks to me, though, we'll have to look it over better, we can't just leave it like this."

Brown shook his head. "I don't know," he said. "I don't know if I can take any more in that pressure suit."

"Well, with a little rest we should be good for another ten minutes or so. You can stay here and take it easy, there's a flashlight in the survival kit, I'll take that and take a quick look around myself."

"I hate to chicken out on you, captain," Brown said. "I just don't think I could do much good, I've just about shot my wad, and that's it. For a while there, jumping across, I didn't know if I'd make it or not. Five hundred yards is a long way to jump, with a thousand miles to fall if you miss."

"That's O.K.," Goodrich said. "You've done your share, you sit here and take it easy."

They swung around within radio range of the ground station again.

"Thumbtack, this is Rubberneck," Goodrich said. "Bertha condition Zebra. Apparently derelict. I say again, apparently derelict. We are now tied up to Bertha. There is an open hatch. Do you wish us to investigate the interior? Over."

There was the usual acknowledgment and pause. "Another committee meeting," McKay said. Goodrich grunted.

"Bartell here again," the radio said. "How are those pressure suits doing, can you stand any more? No, wait a minute, on second thought, don't answer that, that's classified." He broke off, frustrated. "I'll tell you what, Goodrich, you know the situation, just use your own discretion. Get what you can, but don't endanger the rocket or your crew. The thing is, it cost us a billion dollars to put you

up there, we can't send somebody else up tomorrow to check up on anything you overlook; but at the same time we don't want to lose what information you already have."

"Rubberneck, Roger. We will investigate further and advise in fifteen minutes. Out."

"We're getting valuable now," McKay said judiciously. "We've got dope they want. Before, it was 'without regard.' "

"Yeah, I guess so." Goodrich reached for his helmet. "O.K., boys," he said. "Let's go. Get me that flashlight, will you, Mac?"

McKay rummaged in the survival kit. "There're two flashlights here," he said. "You want me to go along?"

Goodrich hesitated. "Well, I don't know . . . the ship—"

"If there's anything dangerous there, we'd never know it here in the ship till it was too late anyway. With two of us, we can cover ground twice as fast, and if one of us passes out in these suits, the other might be able to bring him back. I'd better go along."

"O.K.," Goodrich said. "We'll both go."

"I might as well go along, too," Brown said. "If I have to be depressurized anyway, I might as well be useful."

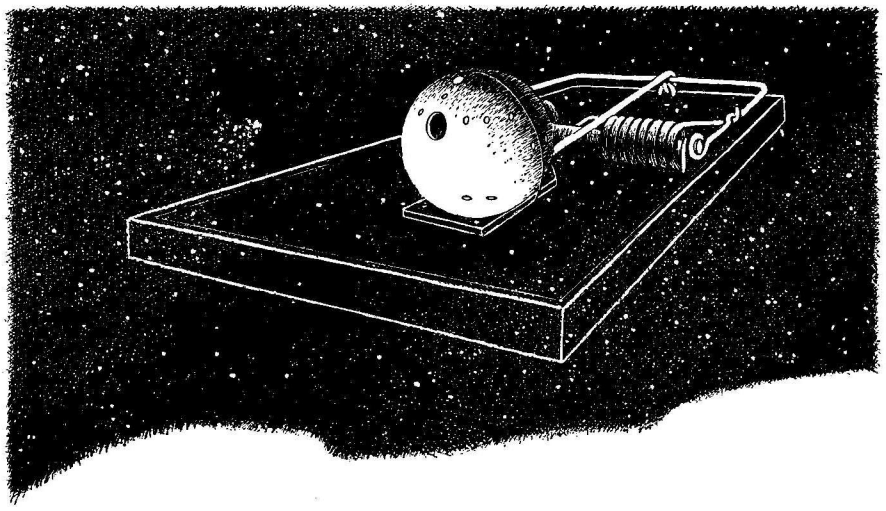
They bled off the air and opened the hatch. The rocket had taken up the rotation of the sphere, so that it appeared to hang nose-down under the slight pseudogravity of centrifugal force. Goodrich went first and McKay and Brown followed, hopping up from the hatch and catching the line from the sphere. They went hand over hand along the line and pulled themselves into the airlock. There was nothing much to see here, a few controls labeled with strange symbols, and they did not tarry. At most, Goodrich estimated they had fifteen minutes in the pressure suits to work with. He motioned McKay off in one direction along the corridor and pulled himself along a life line attached to the inner wall in the other direction, with Brown following him. The outer wall was corrugated, apparently a walkway, and there were doors set in the sidewalls. This ship was meant to spin, he thought, so that the outer skin would be the deck. The rotation it had now was just enough to give him orientation, not enough to walk under.

One of the doors was ajar. He pulled it open and flashed his light around. It gave the impression of being living quarters of some kind, what seemed to be a bunk frame was folded against the bulkhead, and there were panels that hinted at lockers. He tried one of these panels but could not make out how it opened, if it did.

He hurried on along the corridor, trying doors at random, flashing his light around inside, feeling a growing uneasiness.

There was no trash.

When men leave a place to which



they do not intend to return, they leave behind mementos of their presence—old pinups on the walls, or at least scars where they have been; discarded socks in corners; used razor blades on washstands. This place had an empty but well-swept feel about it. It did not fit with the hatches swinging ajar and the dead dark airlessness. Of course, the creatures who had built it might not have been men, but they were manlike, as evidenced by its proportions and fittings—

There must be a control room, or flight deck, somewhere in this thing, Goodrich thought, that will be the key.

They came to a passageway intersecting at right angles. Goodrich paused and oriented himself. Using the axis of rotation as a reference, the hatch and the main corridor were on the equator of the sphere. At the north polar axis, he remembered, there was a bulge and a cluster of external gear, hinting at a concentration of navigational gear within.

Remembering something he had once read, he grasped Brown's arm and pushed his helmet against the other man's.

"Can you hear me?" he asked.

The answer was thin and reedy, they were under only partial pressure in the helmets, but understandable.

"O.K.," Goodrich said. "I'm going to leave you here. You keep your helmet shoved up against the wall of this passage. If you hear three bangs, get back and get out of the lock, cut the cable and stand off about five hundred yards in the rocket. If I don't signal in thirty minutes, fire up and go home. I don't like the feel of this, it feels fishy, I'm going to look around a little

more, but I don't want to take a chance on losing the rocket."

He found the flight deck at the end of the cross passage, a circular compartment about ten feet across. There were recognizable seats surrounded by clusters of completely unfamiliar equipment, but no acceleration couches. He flashed the light around, studying the equipment. The same air of unused readiness characterized this place. A bank of small round, oblong, and tubular gray glass surfaces caught his eye. Above two of them, greenish tinted cards were neatly pasted. Tangled purple symbols fluoresced softly on the cards as his flashlight caught them. Correction cards, Goodrich thought, for instrument calibration. But there were no clipboards in the racks by the pilots' seats, no much-folded charts and briefing data thrust into odd crannies, no dead cigarette butts, or what might be the unearthly equivalent of cigarette butts, lying in the unearthly equivalent of ashtrays.

He bent closer to study a row of tiny beads. There seemed to be an amber glint deep inside one of them. Some trick of reflection, Goodrich thought. He turned the flashlight off. The light, just a bare glint, was still there.

Why should an abandoned ship have power?

A sudden flash of reflected light off the panel startled him. He glanced back over his shoulder and saw the passage behind him outlined in a glow of light and he had a sudden sick feeling that this was it, the trap had sprung. Then he saw that the glow was the reflection of a light being carried along the corridor, and still hidden from him by the curve. A moment later McKay came into view. He drifted over and pushed his helmet against the navigator's.

"You find anything?" he asked.

"Looks dead," McKay said. "I followed that corridor all the way around till I met Brown, he said you were up here, so I came on up. What's this, the flight deck?"

"Looks like it. Come here a minute, I want you to see something." Goodrich moved back to where he had seen the panel light. It was now purple. Goodrich stared. His eyes were beginning to blur again, it might be that, he thought. He shoved his helmet against McKay's. "What color is that light?" he asked.

"Looks purple to me," McKay said. "What do you think it is?"

"I don't know, but I don't like it. It was amber a minute ago." He pulled himself over to a wall and banged three times on it with the metal flashlight. "Come on, let's get out of here. Something's happening here, it may be booby-trapped." He started to move toward the passage.

Lights flashed on in the passage and flight deck.

He stopped, bewildered by the sudden glare, and glanced back at the control position. There was another

light beside the first now, also purple. As he watched, another winked on, and a thin red line began to climb up one of the tubes.

Bertha was coming alive.

"Listen!" McKay said. "Do you hear something?"

A thin sound, just on the edge of audibility, built up quickly to a heavy boom. It was a voice.

"*Ibj b'kirac,*" it said. "*Nqaroq!*"

"Pressure!" Goodrich said. "We're getting pressure in here!" He could feel it now. There were six purple lights on the panel, and green dots and red lines were crawling on the glass surfaces he had thought of as indicating instruments.

The hatch, he thought suddenly, if we've got pressure, the hatch must be closed—

"Get below and see if Brown made it out the hatch," he told McKay. "If he didn't, see if you can get it open and get out with him, he knows what to do."

"How about you?"

"Never mind me. We're committed now, I'll stay here and meet these people, whoever they are; but I want that rocket in the clear. Now move!"

"*Uirq-sebusa!*" the strange voice said. "*Uirq-sebusa!*"

McKay jumped and flew down the passage clumsily, shoving himself off the curve with his hands.

The voice spoke again: "*Uirq-sebusa! Uirq-sebusa!*" This time, Goodrich localized the sound as coming from what might have been a speaker in the overhead. Ship intercom, he thought, that repeated phrase must be some sort of challenge, maybe I ought to answer. He started to move back to the control position, looking for something that might be a microphone, and found he could not.

"*Bimsqik erikusic!*" the voice warned. "*Uirq-sebusa!*"

Nothing palpable held him, but he could not move. He kicked out involuntarily, startled at the resistance, and flew back against the bulkhead. He found he could not push himself away from it again.

"*Bimsqik erikusic!*" the voice repeated.

He still could move sidewise along the wall. He pushed himself along carefully until he reached the passage and found it clear. The force that had restricted him stopped at the entrance to the flight deck. He could not move back inside the compartment, but he could move about freely in the passage.

They don't want me in there, he thought, *afraid I'll start twisting knobs, I suppose.* He waited, just inside the passage, watching. The green dots and red lines and purple lights were steady now.

There was a scuffling sound in the passage behind him. He spun around. It was McKay and Brown, coming back up.

"The hatch was closed when I got

there, captain," Brown said. "Mac came along and we tried to get it open. There seems to be some sort of controls there, but they don't answer. I think they're disabled, maybe on a safety interlock of some kind."

"It might not be a safety interlock," Goodrich said. "The hatch might be locked, to keep us in." He told them about the barrier to the flight deck.

McKay tried it and was impressed. "This is pretty hot stuff," he said thoughtfully. "You know what that is? That's one of those force screens you read about, only they're not supposed to be possible. You ask me, we've run into something really big here."

"Bigger than we are, anyway," Goodrich agreed. "I keep thinking about Goldilocks. Brown, suppose you get back below to that hatch and keep an eye on it, just in case Papa Bear comes home. Mac, take another scout around and see if anybody or anything has come out in the open yet. Try all the doors. I'll stay here and watch these instruments, if anything else is going to happen it might show on them."

For half an hour, nothing did happen. McKay returned and reported no sign of life in any of the open compartments. "I did find the galley though, I think," he said. "I looked in one compartment and it shot a kind of cookie and a bottle at me." He showed Goodrich a round brownish cake and a flexible transparent container filled with colorless fluid.

"Might be," Goodrich said. "On the other hand, maybe you just found the janitor's locker. That might be soap and window cleaner."

McKay looked at the objects doubtfully. "They could be," he agreed. "Anything happen up here?"

"Not a thing."

"You know, I don't like this. Maybe we could break that hatch open. You think we ought to give it a try?"

Goodrich shook his head. "Let's wait a few minutes longer. Whoever's running this show knows we're here. If we try to break out, we might start something we don't know how to finish. Let them show their hand first."

Their oxygen was running low, and it occurred to them to test the air for breathability. It seemed to be at about sea-level pressure and composition. They took off their helmets.

McKay nibbled at the cake. "Tastes O.K.," he said. There was a nipple in one end of the flexible container. He put it in his mouth and squeezed out a few drops, rolling them around his tongue. "Water," he said. "Just plain water." He frowned. "Water, food, air, power; but nobody at home, this whole thing just sitting here waiting for us—I don't get it. This Goldilocks deal, now—you think we might have just happened in while they were out for a little stroll?"

Goodrich frowned thoughtfully. "I

don't know what to think, Mac. It could be. That barrier to the flight deck, it might just be a safety feature, to keep unauthorized personnel from tampering with the controls. And the hatch, that might be on a safety interlock that operates from here, or maybe we just don't know how to operate the controls. People smart enough to build a ship like this, they might have everything on automatic control, so that as soon as somebody comes in on the flight deck the power goes on and the ship pressurizes.

"On the other hand, why blow all their air out when they leave, if they have an air lock? And why does everything just fit us, plain ordinary people from Earth, instead of ten-armed octopuses from Mars?"

"It doesn't add up, that way," McKay agreed. "I'll swear to one thing, though, this ship wasn't built on Earth, at least not present-day Earth." He thought for a moment. "Hey, how about that, you think there might be something to this Atlantis business? This thing could have been up here for twenty thousand years, it wouldn't show any change. What do you think?"

Goodrich shook his head. "That doesn't fit either. People who could build a thing like this wouldn't just vanish off the Earth and not leave anything but chipped flint arrowheads." He rubbed wearily at his eyes, still bloodshot and sore from the pressure suit. "There is one possibility—" he broke off. "Look at that!" he said sharply.

A new red line had begun to slide up one of the tubes on the instrument panel.

There was a slight lurch.

"*Uk b'kauq,*" the speaker boomed. "*C'queta!*"

Outside, the line holding the rocket had suddenly uncoupled itself and snaked up to coil about two bitts. The rocket drifted slowly away. A rosy glow sprang out all around Bertha, deepened. She swung out of her orbit, slowly at first, then faster, catapulting outward from the Earth and the Sun, rising at an angle to the plane of the ecliptic.

Inside, the men felt only the first lurch. They waited tensely, but it was not repeated.

"The rocket," McKay said. "That was the rocket! The line must have parted."

Goodrich nodded. "We're stuck now, even if we do get out the hatch."

"Well," McKay said. "At least Bertha can't go very far, I looked her over pretty good and I didn't see any sign of rocket or jet tubes. Sooner or later, somebody will get up here and get us out. If the three bears don't come home first, that is."

"Maybe Bertha doesn't need rockets," Goodrich said. "How about that force-field thing? That's pretty advanced, it wouldn't fit with just rockets."

"Yeah, that's right," McKay said thoughtfully. "They might even have acceleration whipped. If they have, we wouldn't even know if we were moving. I wish whoever is running this show would come on out and let us get a look at them."

"Well, I'll tell you," Goodrich said. "I don't think anybody *is* running it. I think it's all automatic. I think maybe Bertha was put here just for us to find.

"Suppose that somewhere in the universe, there's a race that has space travel, maybe even faster than light. They get around and explore hundreds of suns, thousands of planets, and now and then they find one with intelligent life. Now there's a chance that any planet with intelligent life may develop space travel also, and naturally our galactic spacemen want to know about it if they do. At the same time, there's an awful lot of planets in the universe, they can't establish a regular watch over all of them.

"So here's Bertha. They leave her sitting here, maybe a year ago, maybe five hundred years ago, maybe fifty thousand years ago. As long as nothing happens, Bertha just stays here, year in and year out, swinging around and around the Earth every two hours and twenty minutes, all loaded and ready to go, the door open, waiting.

"Down on the Earth, men chip flints, and then they build carts, and then they build ships, and then they build aircraft, and Bertha still sits here. Finally then, they build a rocket capable of escape velocity. They bust their guts to get up into a free-fall orbit, and there's Bertha, waiting, with the door open. Any race curious enough to develop wheels and wings, that's all the bait they need, just an open door in the right place.

"You get it? The right food, the right water, the right air, the right temperature, it's all just too pat. A super mousetrap—"

McKay nodded. "It could be. On the other hand, it might not be, we don't know, all we can do is guess. Now supposing—"

"*Kefqs c'qeta!*" the speaker interrupted.

Bertha had now reached a point several million miles above the orbit of Mars. The reddish glow suddenly changed to purple.

"*Kefqs c'qeta!*" the speaker said again.

Bertha vanished.

THE END

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BY P. SCHUYLER MILLER

"ONE WORLD" Part 2

Last month I pointed out that there seems to be a resurgence of books which try to sell the idea that at some past time the world has been encompassed by a single high civilization—Atlantis, or something a little less dubious—which later fragmented into the cultures of history and archaeology.

The late Colonel P. H. Fawcett, who in the first quarter of the century gained a position in the public eye of "high priest" of this lost city, lost race concept, says relatively little about it in his book, "Lost Trails, Lost Cities" (Funk & Wagnalls, $5.00), which is really an excellent book of personal adventure in the South American back country of fifty years ago.

Orthodox archaeology, exemplified by the recently published "Handbook of South American Indians," neither confirms nor denies Fawcett's belief that a high culture did exist in Brazil. It just hasn't looked.

Where Fawcett seems to have gone part-way overboard where occult manifestations and theories are concerned, in seeking support for his "City Z," Harold T. Wilkins in "Mysteries of Ancient South America" (Roy, $4.00) goes all the way.

In direct distinction, especially to

the Wilkins book, is Thor Heyerdahl's "American Indians in the Pacific" (Rand McNally, $15.00). It belongs in this discussion only in that it also contends that the ancient world was to a far greater extent "one" than most people will admit.

The book is a handsomely printed compendium of more than eight hundred pages of parallels which Heyerdahl has collected between American and Polynesian cultures, and which led him to the theory that the Pacific islands were peopled from America in two waves—one about 500 A.D. by a white, bearded people from Peru; another between 1100 and 1300 A.D. to Hawaii from the Puget Sound-Alaskan Panhandle section of North America.

Heyerdahl's Kon-Tiki expedition was undertaken to prove that rafts from Peru could and would float to Polynesia. As I write, the New York *Times* reports that two Englishmen and a New Zealander intend to push off from Plymouth and drift first to Dakar, then across the Atlantic to the West Indies.

I have saved until last the baffling "America's Ancient Civilizations," by A. Hyatt Verrill and Ruth Verrill. The authors are remembered with affection by most old-time science fiction readers, and with gratitude by a couple of generations of schoolteachers and librarians who found their one hundred fifteen books on every subject under the sun both readable and reliable. But now the lid has come off!

The greater part of "America's Ancient Civilizations" is a running account of the more colorful and spectacular aspects of the higher American cultures, from Mexico to Peru. (There is, incidentally, no account of any lost civilization in Brazil.) By and large this part of the book is authentic, based both on contemporary accounts by the Spanish conquerors and explorers and on what the author has seen for himself above- and underground.

But in interpreting this mass of material, we have a "one world" variant which attributes everything to the Sumerians.

This new element seems to hang on a long, unpublished study by Mrs. Verrill, "Gods Who Were Men," about which some distinguished Americanists are quoted as making some highly noncommittal statements. Her conclusions make Velikovsky's rewriting of ancient history in "Ages in Chaos" seem conservative!

It would, as Velikovsky's critics pointed out, take a lifetime of research and a book twice the size of the original to appraise and refute a work of this kind. I don't like to mark up my books, but I did fill this one with marginal notations on points which I—a complete non-expert who has done some consistent reading in the new "orthodox" archaeological books and journals—find downright silly.

The basic trouble is probably the

bristly "strange dog" attitude which affects *both* the orthodox and the unorthodox. Evidently Verrill was among the first to do any digging on sites of the amazingly high Coclé culture in Panama. I don't know whether he ever published his finds in any scientific journal: certainly he lists no such reference in the bibliography of his book. But he did make—and shows here—finds of unusual carved stone columns which the summaries of Panamanian archaeology, in such basic reference works as the recent "Handbook of South American Indians," simply ignore. He complains of this in his chapter on Coclé, and rightly.

There is something to be said on the conservative side. In the 1920s even the best of archaeologists, digging for the most progressive museums, were out to get loot—beautiful or imposing or grotesque idols, pretty pots, mummies, as much gold and silver trinketry as possible—which would impress the public and the trustees, look good in the cases, and make it easy to get money for more digging for more curios. Note-taking under these circumstances was a complete waste of time, and from most of the collections made in these pioneering days you would never get the slightest idea whether the poor dumb Indian-in-the-hut in Chan-Chan or Coclé or Teotihuacan made flint arrowheads or ran game down and strangled it with his bare hands.

Under these circumstances, still not entirely remedied, the present-day archaeologist, trained in stratigraphic digging and voluminous note-taking, has reason to be dubious about finds made in the "good old days." By the same token, old-timers like Verrill seem to delight in refusing to pay attention to anything these Johnny-come-latelies report. They set up straw men and beat them down savagely, when even popularizations of the recent work would show they are making fools of themselves.

Verrill seems hopeful that, because Carbon-14 dating has upheld a considerable antiquity for some of the Early-Hunter complexes in both Americas, it will vindicate some of his wild ideas of the age of the higher cultures —"thousands of years old." Tiahuanaco, following the alleged astronomical correlations of Posnansky and his school, is made 14,600 years old (by one formula; 9,300 years by another). In cold fact, carbon dating would put the beginnings of the Tiahuanaco culture about 2,500 years ago. Moreover, instead of being the grandpappy of all American cultures (Posnansky would say of the world), it is *preceded* in various parts of Peru and Bolivia by a whole series of cultures, including a pre-pottery horizon which carbon-dates around 2,500 B.C. *and which nobody bothered to look for until 1946!*

Who wants to bother with poor, ignorant savages and broken pots when there's gold in the graves?

Actually, "orthodox" Americanists are taking more seriously than ever before the possibility that the world *was* "one" to a greater extent than anyone has admitted. But there is a definite difference between this kind of one-world approach and that in the books we've been discussing. For the first time a generation of competent, intelligent Latin American scholars are excavating without prejudice.

Throughout the older books you see a subtle or blatant racism. Anything good and striking in the Americas couldn't have been devised by the poor, dumb, savage Indians! They—as Fawcett's memoirs show so clearly—were less than dirt! The high civilizations *must* have been introduced from the Old World—and, of course, by white men.

This attitude hung on longer than it should have. Educated Mexicans and Peruvians went along with the old prejudices and tried to build up their Spanish fraction at the expense of their Indian ancestry. North Americans, with a thorough contempt of everything not white and Anglo-Saxon to boot, went right along—as they had in seeking an exotic origin for everything interesting in the United States.

Now, though, we have the Julio Tellos and the Rafael Larco Hoyles whose work is fast making up for the years of shamefacedly trying to make everything European.

There is a kind of family likeness among the higher American cultures, from Arizona to Chile and Argentina. There are other similarities among the first civilizations and pre-civilizations of the Old World, from Egypt across to the Indus. There is growing evidence that people from these centers did travel and trade and occasionally got around to see each other.

However, the "narrow-minded" orthodox archaeologist wants evidence for such contacts—preferably evidence he dug up himself, or that was uncovered by someone whose excavating techniques he trusts. And there *is* such evidence. Undoubtedly some of the striking parallels, especially between the American cultures, which Verrill describes are real. The kind of documented evidence Heyerdahl cites is even more impressive. But it can't be taken at face value—and the only person competent to appraise it, and with time for the work, is the professional archaeologist.

A shovel's depth in a dry cave may span thousands of years of human occupation, from a fluted "Folsom" or "Sandia" point in the bottom to yesterday's beer-can on top. Yet one flood will bury a river-bottom site with six feet of mud overnight. Mere depth means nothing without the full stratigraphic record of how everything lay in the ground. Digging without stratigraphy is merely sponsored vandalism—for no archaeological "experiment" can ever be repeated.

The race is between the handful of painstaking scientific excavators with

shoestring budgets and the curio-collectors who want show-pieces and don't care how they get them or where they come from. Unfortunately, in our advanced culture, a specimen is usually worth more in cash as a curio than it has scientific "value" to a museum. So who gets the extraordinary new finds? And how much dependable information goes with them?

Maybe, as the Verrills maintain, the Sumerians did reach Peru. Maybe Phoenicians explored the United States. Maybe there is an unknown high civilization, comparable to that of Chavin, or Chimu, or Mochica, or Tiahuanaco, lost in the highlands of Brazil. Maybe the Irish were in New England, and the Buddhists in Palenque.

But readers of this magazine will understand that attractive possibilities don't add up to a new science without *evidence*—consistent, noncontradictory, reasonably abundant, and above all logic-tight evidence that would stand up, if need be, in court.

And I don't mean an "eyewitness" statement that halfway up a thousand-foot cliff at the head of an unexplored river in the trackless wilderness of Venezuela there is an inscription in solid gold letters, in an unknown script, in an untranslatable language, which says: "I, Herbert K. Khufu, founded all American civilizations on this spot, July 19, B.C. 25,272. Look on my works ye mighty and despair."

ICEWORLD, by Hal Clement. Gnome Press, New York. 1953. 216 pp. $2.50

This was serialized here so recently that I hardly need do more than say, "Here it is in hard covers."

Hal Clement excels at the kind of straight science fiction, a step beyond Heinlein's, in which he takes equal pains to work out an adventure as seen by, and directed by the peculiar nature of, an alien form of life. The best of these was his "Needle"—now in a Doubleday dollar edition—in which a protoplasmic otherworlder invaded the body and mind of a boy. The recently serialized "Mission of Gravity" is almost completely an intellectual exercise, and as such may not be too popular except with the technical wing. "Iceworld" is in between.

In it Sallman Ken, who comes from a world where the atmosphere is sulfur vapor, is planted in a gang of smugglers who are running in a drug, tobacco, from the "ice world," Earth. He is to uncover the secret of the drug, in the hope that the gang can grow it in their own sizzling environment. He does so, but manages also to make contact with a family on Earth, surmount the barrier that a few hundred degrees of temperature set up between the planets, and of course trip up the dope-runners.

As an intellectual puzzle, it's top-rank stuff but we never quite get under Ken's skin and I suspect the book

will be popular only with a certain clique of science fiction readers.

THE ABYSS OF WONDERS, by Perley Poore Sheehan. Polaris Press, Reading. 1953. 191 pp.

This is the second of Lloyd Arthur Eshbach's limited-edition books of fantasy and science fiction—rare old "classics" of a generation and more ago in fine paper and binding, by subscription only.

"The Abyss of Wonders" is a lost-race novel with psychic trimmings, much in the mood of Merritt's "Dwellers in the Mirage," which was originally serialized in *Argosy* in 1915. The author, a newspaperman who spent a good part of his life in France, wrote a large number of popular novels in the highly moral, black-and-white vein of the time, including some remembered fantasies. He also adapted and, I believe, directed the silent, Lon Chaney version of "The Hunchback of Notre Dame," living in California until his death in 1943.

The quality which has given some of Perley Poore Sheehan's stories "classic" standing among readers of the old Munsey magazines probably derived from his newspaper training and experience, plus a strongly sincere mystical element in his own make-up. His tales are dated in manner and theme, but there is an odd simplicity and freshness about the way they are written which keeps them alive.

Sheehan's most exasperating trait was throwing away big scenes and whole episodes which Merritt would have built up tremendously. "The Abyss of Wonders" is full of examples of this ultra-economy—perhaps developed in his years of filing cables from Paris.

John McGoff, still a schoolboy, has visions in which he sees himself as the conquering hero, Shan Makaroff, in a lost land of wonders in the heart of the Gobi Desert. Grown, he goes there, meeting two boyhood friends, the Chinese laundryman Charley Ling and the Russian cobbler, Ivan, his "brothers of the Blue Wolf." Fighting sandstorms, illusions, mysterious subhuman riders of the desert, they do find the hidden Mountain of Jade where the last of the Sun People, survivors of a forgotten elder day, still live. Here is the beautiful Ai-Yaruk, the villainous Mok-Ruk, the science of another time in the Abyss of Wonders.

Every collector has to have these Polaris specials. Casual readers will probably be disappointed if they expect a forty-year-old replica of something which would be published today. In 1915 we were living in another culture—but the time-honored themes cut across cultures and races, and, I have no doubt, planets as well. The inhabitants of Tau Tauri Three undoubtedly have lost-race tales.

LIMBO, by Bernard Wolfe. Random House, New York. 1952. 438 pp. $3.50

This colossus of a novel plays with science fictive ideas in its own individual way to give us one of the most hopeless pictures of a near-future society to see print.

A skillful brain surgeon, Martine, engaged in patching up the human debris of the United States-Russian, cybernetically directed War of 1972, escapes men and machine during a bombing and finds refuge on an uncharted island. Here he spends eighteen years combining the techniques of modern neuro-surgery with a primitive type of lobotomy practiced by the natives to bring their rebels into line with the norm. Then the world of 1990—a very strange, very new world—finds him, and he slips away to explore it.

America is reduced to an Inland Strip just east of the Rockies; Russia to a similar Asiatic Union. And both have gone "Immob."

For it has been Martine's weakness that he expresses his own internal torments and aggressions in cynical quips and puns, in conversation and in his journals. And one of those journals has been seized upon by an opportunist as the foundation of a new philosophy—a society based on the premise that man's aggressions can be washed away only by voluntarily hacking away his means of expressing them: his legs, his arms, even his sex. Poured into the cult of immobilization are catchwords from practically every branch and twig of psychology and pseudo-psychology known to the race, from Freud and Gandhi to Dianetics and the "orgone" school.

At the same time, Immob has bred the ultimate in psycho-cybernetic mobility and aggressiveness. Deprived of their limbs, the young men of the world have made themselves new, atom-powered mechanical limbs which give them powers never dreamed of by natural men. A prosthetic arm can be a surgeon's scalpel, a flame-thrower, a power drill, a machine gun, a helicopter blade. Legs can hurl their possessor a hundred feet in the air. Inevitably there has been a schism between the "true" followers of Immob—basket cases who will have nothing to do with prosthetics—and the Pro-Pros. Stifled aggressions, too, have spilled over into all too familiar channels: the colored peoples are driven into underground servitude, the elite of quadruple amputees trample over everyone. Women, by necessity, since the finest young men are armless and legless, have become sexual aggressors. And behind it all is the rising threat of a new struggle between West and East.

Where "pure" science fiction, in this or any other present-day magazine, would have developed this picture through action, "Limbo" does it through talk and more talk. As you hew your way through this, begin to

sense the tenor of Martine's interminable Freudian puns and see behind them his concept of the masochism in man, the fascination of the picture may grow on you. Two thirds of the way through, the Russians strike, the Strip retaliates, and holocaust amid pacifism rises swiftly. But in the end, bound back to his islanders, Martine is still writing notes to himself in the same wry, tortured vein which brewed —and destroyed—one world-wide culture.

In the school of "Brave New World" and "Nineteen Eighty-Four," "Limbo," perhaps because of its endless talk, is as grim as either but less convincing. Perhaps, in tone and credibility, it is closest to Huxley's "Ape and Essence." It is likely to enthrall you or bore you. I'm not sure yet where I stand.

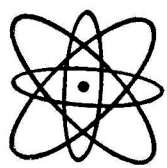
THE SECRET MASTERS, by Gerald Kersh. Ballantine Books, New York. 1953. 225 pp. $2.00; paper 35¢

Time was when this "save the world" theme was much more popular in the borderland between science fiction and detection than it has been lately. All the detective story masters tried it from time to time and men like Sax Rohmer became identified with it.

The plot is usually the same: a master criminal and/or an organization of would-be world-masters hit upon or steal some scientific secret which will enable them to get the world in a nutcracker. Our hero or heroes must find the hiding place of the conspirators, regain or destroy the invention, and save the world.

This is what happens when George Oaks, journalist, and Albert Kemp, writer of occasional science fiction, mistakenly pick up the nervous American gunman, "Monty Cello," and find that he is terrified of one of their own *bêtes noir*, Major Chatterton of the organization known as the Sciocrats. And Monty has been hired to track down a mad scientist, escaped from Chatterton's mysterious stronghold in the Gaspé, and has made the serious mistake of taking off with the man's secret papers—

Presently Monty is dead in the bottom of a well, George and Albert are kidnaped, three degrees of torture are mentioned lovingly . . . well, it's all according to formula. Personally, I'll take John Buchan or Eric Ambler without fissionable silicon.



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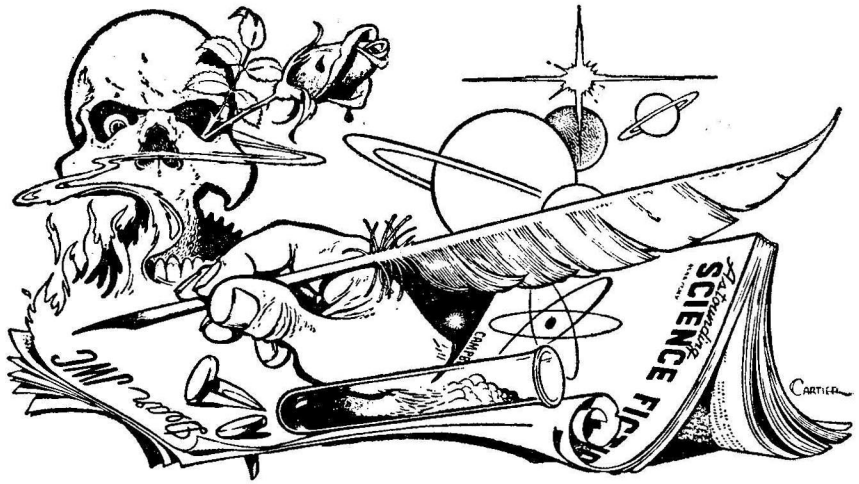

BRASS TACKS

Dear Mr. Campbell:

The letter of Mr. R. L. Benson in the September issue evoked reminiscences of Kimball Kinnison during his first adventure: "'Scrap the plan! . . . Open everything to absolute top —short out all resistors—give 'em everything you can through the bare busbars. . . . *Break down those screens!*'"

I am no defender of the linguistic systems devised by Samuel Johnson, Noah Webster, and their eighteenth century colleagues; however, the rules invented by men such as Leonard Bloomfield, Charles Carpenter Fries, and E. H. Sturtevant of our own day, while more sensible and scientific, are no less difficult to memorize in the long run. Incidentally, Mr. Campbell, if you have not read the twentieth century linguisticians you are due for a treat of what you term "Technicalese" comparable to the language of an M.I.T. specialist.

It is not only in spelling that reform is needed; let us consider the fields of grammar and literature as constituting but two more possibly decadent areas. When I left grammar school I knew all the laws of grammar and punctuation necessary; indeed, they were better utilized then than now. If I am more literate at present all thanks are due to a wide reading program almost all portions of which

were pursued independently of school, a schedule in which the classics and science fiction existed and continue to exist side by side.

Since one rule is as difficult to learn as another, I believe that it is the repetition of subject matter rather than arbitrary "laws" of spelling and grammar *per se* that hinders educational development. In grammar school the rules of grammar, spelling, and punctuation were always repeated along with the new material; in high school there was little but plain repetition year after year; to cap the climax, during both freshman and sophomore courses in college the identical dull rules memorized in the sixth grade were tossed back at us. Not until the upper years as a major subject and in graduate studies was there surcease.

In literature the fare even in some college courses is notoriously childish; in grammar and high school readings given the Board of Education's official stamp of approval the more advanced students are faced with more repetition and no chance to whet their appetites; there is no challenge to the intellect saving private sources.

New rules, as suggested by Mr. Benson, require implementation in several ways so as to aid the fast reader, therefore; for the slow reader I doubt if any system of rules will help his clogged I.Q. Separate classrooms for the I.Q. groups are necessary; the damage wrought now among

crowded-in students of all calibers is far greater than any hypothetical risk of snobbishness.

Recent sections of P. S. M.'s "Reference Library" on French and British science fiction have been contributions to the cause of world literature, albeit minor ones; this department is always the first part of the magazine that I read in any case. By the way, P. S. M. has reviewed practically every recent publication of Fantasy Press but "Second Stage Lensmen"; this is not a top-bracket work of science fiction but, then, neither have been the others. I should appreciate mention of science fiction and fantasy sources among the ancients: Lucretius, Homer, *et al.* A man such as Euripides did not write fantasy for its own sake, but apparently from hints in the classics many of our modern stories have burgeoned. Williamson's "Legion of Space" tales, for example, have always impressed me, so far as the characters are concerned, as shoddy imitations of both Shakespeare and Dumas: Giles Habibula is Falstaffian and his friends are but three more Musketeers. (The action, nevertheless, is not too inferior to that of Dumas.)

September ratings:

1. "What Thin Partitions"
2. "The Garden in the Forest"
3. "Humpty Dumpty"
4. "Gimmick"
5. "Little Joe"

"The Garden in the Forest" was a very close second, if second at all, indeed. As you say, "Those 'simple little stories' are the hardest kind to do!"—Robert Sherwood, 208 Pearsall Avenue, Jersey City 5, New Jersey.

I'm afraid Boards of Education are forced to choose a least common denominator—and that means least imaginative. People have to agree on facts; it's imagination that can't be agreed on!

Dear John:

A letter by one Frank P. Beardslee printed in "Brass Tacks" September 1953 contains—in addition to a great deal of abstract "logic" which I personally doubt—one basic error in fact which I would like to correct. For although truth can never quite catch up with fallacy, I am one of those dreamers who try to keep the amount of untruth in circulation down to a livable minimum.

Beardslee writes, and I quote: "I am informed by my physicist friend," 'We can tell where an electron is, or how fast it's going, but never both, nature's just that way.' My friend probably tells the truth in this sense, that location, or velocity, not both, are within his present power to measure; but when he asserts that location and velocity can never both be measured in a single instance he is merely making a deduction which may be reversed in tomorrow's headline."

Now, the facts are that we not only

cannot measure both position and velocity of an electron: we can be certain that no tools can ever be invented that will overcome this paradox. For, THE VERY ACT OF OBSERVING ITS POSITION CHANGES ITS VELOCITY, AND THE ACT OF OBSERVING ITS VELOCITY CHANGES ITS POSITION, and this holds true whether the "observer" is a man, a machine, or a Martian. This is a fundamental axiom based on the nature of the electron itself. One can no more escape this dichotomy than one can be simultaneously in two places at once, or measure the heat of an uncertainty, or describe the shape of a loneliness.

Mr. Beardslee probably thinks of the electron as a small sphere ambulating about a second sphere called a nucleus. Such a thing does not exist. The actual electron is an undulating charge of electrical energy, the actual atom merely a system of superimposed waves. In the light of such evidence as we presently possess, it is possible to describe the atom in terms of PROBABILITIES only, and whether even that much certainty will withstand future scrutiny may, perhaps, be doubted. But any hope of being able to proceed further with two-valued Aristotelian methods must be clearly abandoned as wishful fantasy.

As a matter of fact, if we could measure both the position and velocity of an electron we would be even

further away from traditional "logic" than we are today—for that would present us with the paradox of the electron being TWO DIFFERENT THINGS AT THE SAME TIME, i.e., that which we already know it to be, and some weird thing entirely and radically different. Even those who have been able to visualize light as being simultaneously waves and particles might find THAT a little too much to understand. It even scares an old multi-ordinate time-binder like myself.—Robert E. Wilson, 177 13th Street, Brooklyn 15, New York.

And—worse and more of it!—the electron can be in two different places at one time.

Dear Mr. Campbell:

Howard Bodger, in "Brass Tacks" of the October issue joins the author of "Genetics" in rejecting negative eugenics, on the grounds that selection against undesirable traits—most harmful genes being recessive, or becoming so under the influence of selection—can eliminate only the relatively small number of homozygotes from the breeding stock.

This viewpoint was, I believe, first presented by J. B. S. Haldane, the famous British biochemist and geneticist, and both because of the eminence of its author and on account of its intrinsic interest, it deserves a more complete discussion. In essence it is a relative rather than an absolute argument; the only genes that are permanently protected against selection by heterozygosity are in the Y-chromosome, and they have a disturbing tendency to lose any significance they possess. As the gene becomes commoner, the percentage of its members subject to selection increases. If p represents the ratio of the numbers of a particular recessive gene type to the total numbers of the alleles, the per cent of the gene exposed in homozygotes is $100p$, assuming random selection of mates and a fairly large population. (This does not apply to genes on sex chromosomes.) So the efficiency of selection is a declining function of selection itself, grows less as the goal (p=zero) is approached.

No other objective for which mankind strives is abandoned because it cannot be completely realized. No government yet has attained 100% employment, no marriage is 100% happy, no public health program stamps out 100% of disease, no educational system produces 100% literacy, let alone 100% educated. Natural selection itself, to introduce a personification, is able to operate with tolerable effectiveness by eliminating homozygous defects; it is surprising how rapidly a 1% disadvantage will operate to reduce the p of a harmful gene. If anyone doubts the value of elimination of homozygotes from breeding, let him examine the eyes of cave animals or the sense organs of Hymenopterous parasites; or consider the coat

colors of domestic animals as compared with their wild relatives.

These degenerations and changes when the selective pressure is removed, to be sure, take time; a considerable number of generations is required for harmful genes to increase from low values of p to frequencies where homozygotes are common. One might think it would not happen at all, that chance would favor the extermination of a rare gene regardless of selection. Two factors influence the situation: mutations are happening all the time, most of them are harmful; and large numbers of genes are affected in the mutational process. When selective pressure is removed, the stops are pulled out for all types of variations to accumulate, and many harmful mutations reinforce each other. The ordinary health organism is the product of thousands of genes, as delicately adjusted to each other as the mechanism of a watch; mutations act like the shocks and damage which happen to a real watch during its operating life. The tool that keeps the watch up to standard is the elimination of homozygotes carrying defective genes.

Although it acquired an evil reputation during the Hitler regime, the object of negative eugenics is to replace the bloody tactics of natural selection by more humane methods. In the absence of artificial selection, natural selection will ultimately take over. There is a limit to the devices of science, but no limit to the process of

degeneration until dead matter is reached. You may give insulin to diabetics and extract plasma components for hemophiliacs, put spectacles on the half-blind and invent Braille for the wholly blind. But sooner or later the variability of living matter will come up with something, like congenital amaurotic idiocy, that you cannot keep alive no matter how hard you try; and the more the deleterious genes accumulate, the more likely this is to happen.

Mr. Bodger likewise rejected positive eugenics, because geniuses cannot be produced to order, like baking a cake. The greatest breeder cannot, perhaps, breed a sweepstakes winner to order; our knowledge of the heredity of genius needs a lot of extending. Yet, however we may define genius, I think most people would agree that a man is an intellectual genius as compared with even a smart flatworm; and most of the readers of Astounding would agree that something very like a flatworm gave rise to man—and it did not require complicated analyses of genes and knowledge of how to combine them, to accomplish this. It was carried out by the crude method of selection of the more elaborate nervous variants for progenitors, and this selection did not distinguish between acquired and hereditary characters.

I do not see that eugenics should be abandoned because it does not provide instantaneous control to the tenth decimal place. It is a fact that no other method gives promise of any control at all; and that if Man does not take hold of his own destiny, other forces will do it for him—are, indeed, doing it right now. Eugenics may be regarded as analogous to conservation. Human civilization has changed the world in ways we had not intended; it is senseless to say, "Laissez faire" and hope that, somehow, somewhere, is a Deus ex machina that will run it all for our benefit.—Alfred B. Mason, M.D.

I'd be a lot happier about setting up a genetics program if I knew for sure what was "positive" and what was "negative." For instance, morons have a very low insanity rate; geniuses have a high neurosis rate. What do you do about such a problem in your breeding program?

Dear Sir:

This letter, I fear, is long overdue. I intended to write when the discussion about the definition of science fiction was going on, and just never got around to it. Here is my definition: "a story placed into a time where science is, in some respect at least, farther developed than now."

Here is my reaction to the article "thinking in man and machines." My definition of thinking is: "a process changing the future to suit the owner of the thinking device."

This definition is unusual and needs explanation. Thinking in man consists

of using the external senses as one input, the bodily needs as the second input; then finding out from the external senses what the future will be, and moving the limbs in such a manner that the future will be advantageous to the body. (p.Ex. senses see food, the body indicates hunger, i.e. need for food. The useful future would be movement of the food into the body. Limbs are activated to stretch out, pick up, et cetera, so that the future —which without interference would have been an unchanged position of food and body—is changed into the useful future of food intake. (About the objection that man does not know the future: Every natural law is knowledge of the future, and that is the only usefulness of natural laws.)

About consciousness: It seems to me that man is in a process of change for the last thousand years or so, and for quite some time to come. Let me explain. Once the application of a set of rules is figured out, a pattern called behavior pattern or habit is set up, and our unconscious sees to the proper actuation of the limbs. (p.Ex. the correct walking down the street we walk every day, while our conscious is busy with something else.) The setting up of behavior patterns is the job of the conscious. It is done by trial and error. Formerly it appears to me, this trial and error was mostly directed by the emotions. Emotions being very rough abstractions of the success or failure of former actions in similar situations. These emotions are slowly replaced by "cold logic," a very approximate method for figuring out by rules from past experience what this time the future, i.e. the result of the action will be. So much for human thinking.

Now about "thinking machines." It seems to me impossible to know already how a mechanical brain will

look, but at least the most fundamental parts, the principle, seem to me so intimately connected with any thinking process that they can already today be described. Using my definition of any thinking process: A thinking machine is a device to change the future to suit the owner. To do that it has to:

Part 1. Sense its surroundings

Part 2. Receive the needs of the owner

Part 3. Determine the possibilities to fulfill those needs

Part 4. Act on these possibilities.

The job of part 1 will be: a) To sense its surroundings. b) To either identify these sensations with past similar ones or not. These sensations are coded into symbols, probably binary. Let us call them binary "numbers." If identified the old number is passed on, if not, a new number is given and passed on. c) All sensations, i.e. numbers are collected in a "reference frame," a sort of report, giving sensations and the places in space they came from. To include a time element always two consecutive reference frames are passed on as input.

Part 2 is by far the most interesting one. There the outside situation, the present, expressed as two "reference frames"—the collection of all sensations—and the needs, the wanted future, meet. They go to division a) The memory for all laws and rules. These laws and rules will consist of the scheme: situation-action-result; and may be specific or general. For instance it could read: door with handle closed-turning handle and pushing-door open. (All expressed in numbers). Or a general one: object in place-forceful movement applied-object moving in direction of applied movement. Here applicable rules are searched for under the numbers received. Probably they will not be found, because the imput will be too specific or too general. So message is sent to b) the composition and decomposition of number concepts. There the number concepts are divided into their parts—a tree into a root, trunk, branches, foliage, et cetera —or parts into the whole,—stones, trees, rocks, snow, geometrical shape and size into a mountain, et cetera. All concepts are stored here as sequences A to B. This process goes on, until a general rule in the memory fits the wanted change of future. The one solution is sent to department c), where this one general rule is split up into specific rules, again with the help of a) and b). The specific rules are then given to Part 3. Here all necessary actions are a) collected, b) put into correct sequences, and c) done. These actions may be a moving of limbs or only typewriting.—W. Fritz, I, Alfaro 314, Acassuso Prov. Buenos Aires, Argentina.

An excellent and highly interesting definition of "thinking," both verbally in a phrase, and in terms of process, I feel.

Continued from Page 7

There are circumstances under which an organism can *not* sit and contemplate long; a situation in which an ice age is either coming or going assures that organic life won't sit in one area and contemplate for very long.

Another hellish thing about Earth is the distribution of the continents and the sea basins. The Americas, in particular, are a great source of trouble. During a Fimbrulwinter, there is an ice bridge connecting the northern continents, and, because of the dropping of the seas to make all that ice, the land bridges to the southern continents are opened. A thousand miles of glacier, however, is almost as difficult to traverse as so much open ocean; the effect is that during a Fimbrulwinter North-South communication is opened, while East-West communication is sealed.

During Fimbrulspring and Fimbrulfall, however, there is a period when the continents are connected, and the animal life is getting some very urgent nudging to git up an' git.

This leads to some unpleasant surprise parties. South America, for example, had a fine, nicely balanced ecology consisting of placental mammal herbivores, and almost nothing but marsupial carnivores—and no land-bridge to North America. But North America was tied in with the great Eurasian land-mass, and was well stocked with placental mammal carnivores. When the land-bridge to South America opened, things happened suddenly and drastically. "Surprise! Surprise! See what we can do!" the placental carnivores might have said. They could do a large number of thoroughly deadly things; they had far better brains, and spent much more effort teaching their young to be effective predators.

About the only marsupial form that survived the surprise party was the opossum. The rest either starved to death, or proved such highly incompetent fighters that the true-mammal carnivores didn't refrain from eating them. (Usually, one carnivore leaves another alone; carnivores are too well

equipped with fighting and killing tools to make a practical lunch.)

So if a life-form survived the ice, and the tortured geology, and the Fimbrulspring floods, and all its local predators, it also had to be able to meet and handle the problems sprung on it by totally new types of life-forms it had never encountered before.

It didn't do much good to learn How To Do It; the ice would come, or the flood, and drive you to a new area where that way To Do It didn't work any more. Or a new kind of animal would come along that couldn't be handled at all by the good old reliable way To Do It.

Man is the perfectly legitimate response to such a situation; if you can't effectively learn How To Do It, then the only thing left is to *learn to learn* How To Do It. In a situation irregularly mixed by a cosmic mix-master, the survivor will be the one that can learn to handle the unexpected and unpredictable fastest. Knowledge is practically useless; learning ability, the ability to learn faster than anything else around, is the only thing that can save you. That strange new life-form from some other continent finds you just as strange; the winner of the fight is the one that can reduce the other to a familiar problem quickest.

After two billion years of being chivvied, chased, and churned by fire, ice and water, some rather remarkably tough and adaptable creatures have evolved. The only thing that they can expect with assurance is the unexpected; it's a hell of a place to live, at first—but after the first few billion years, you get used to the excitement, and learn to enjoy the stimulating environment. (If you didn't, you were lunch for somebody who did.)

Somewhere in the galaxy there is, no doubt, a paradise planet where water isn't maintained on the ragged edge of its critical phase-change. There's probably life on that planet, too.

And some one of these days, there'll be a surprise party there. Interstellar space isn't permanently uncrossable, any more than a water ocean is!

THE EDITOR.

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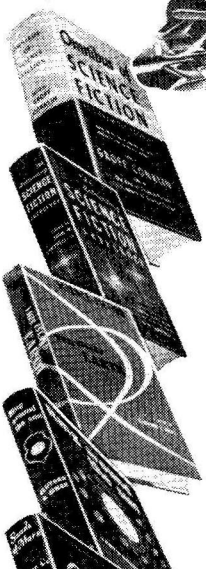

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