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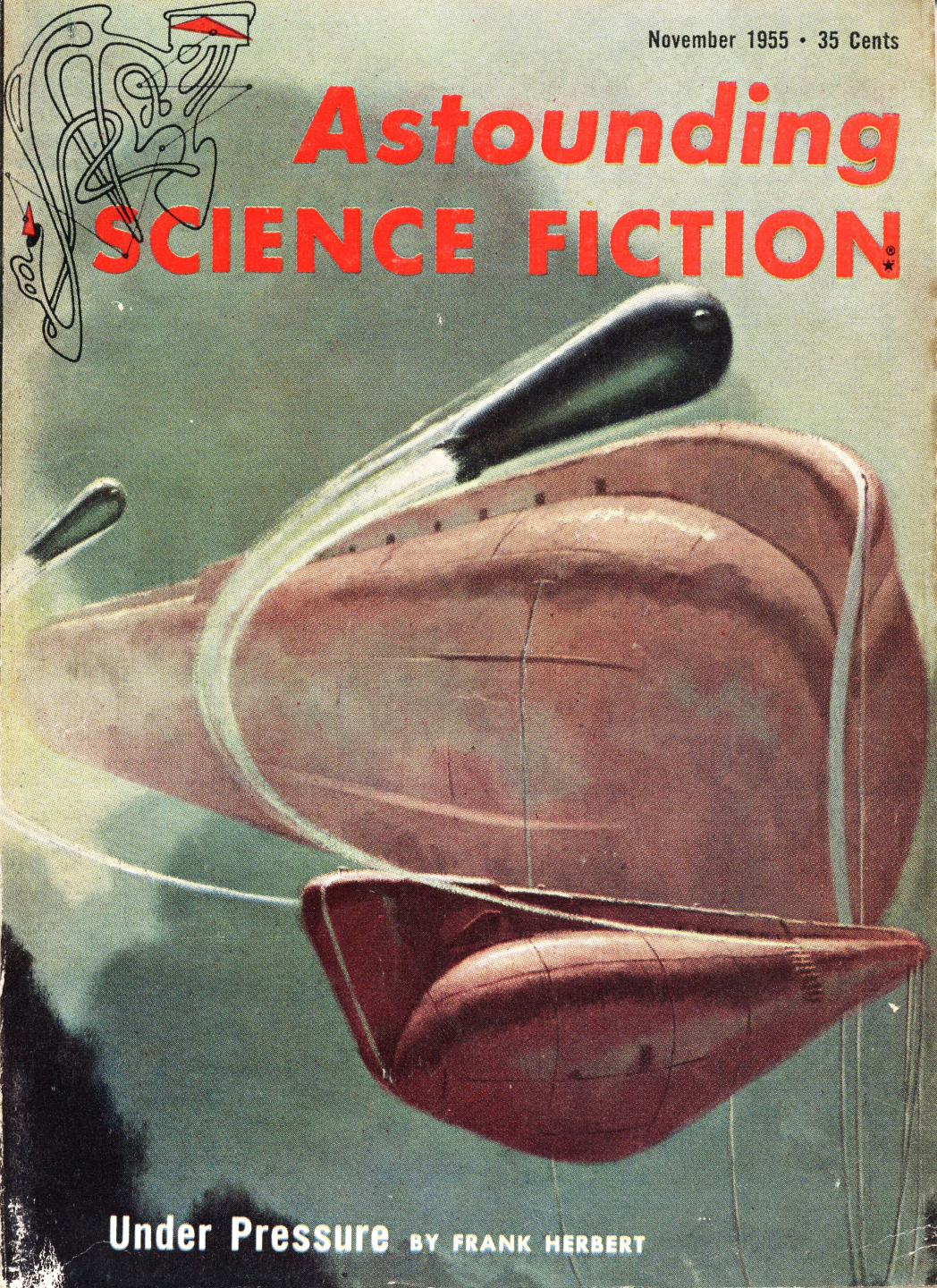

Under Pressure BY FRANK HERBERT

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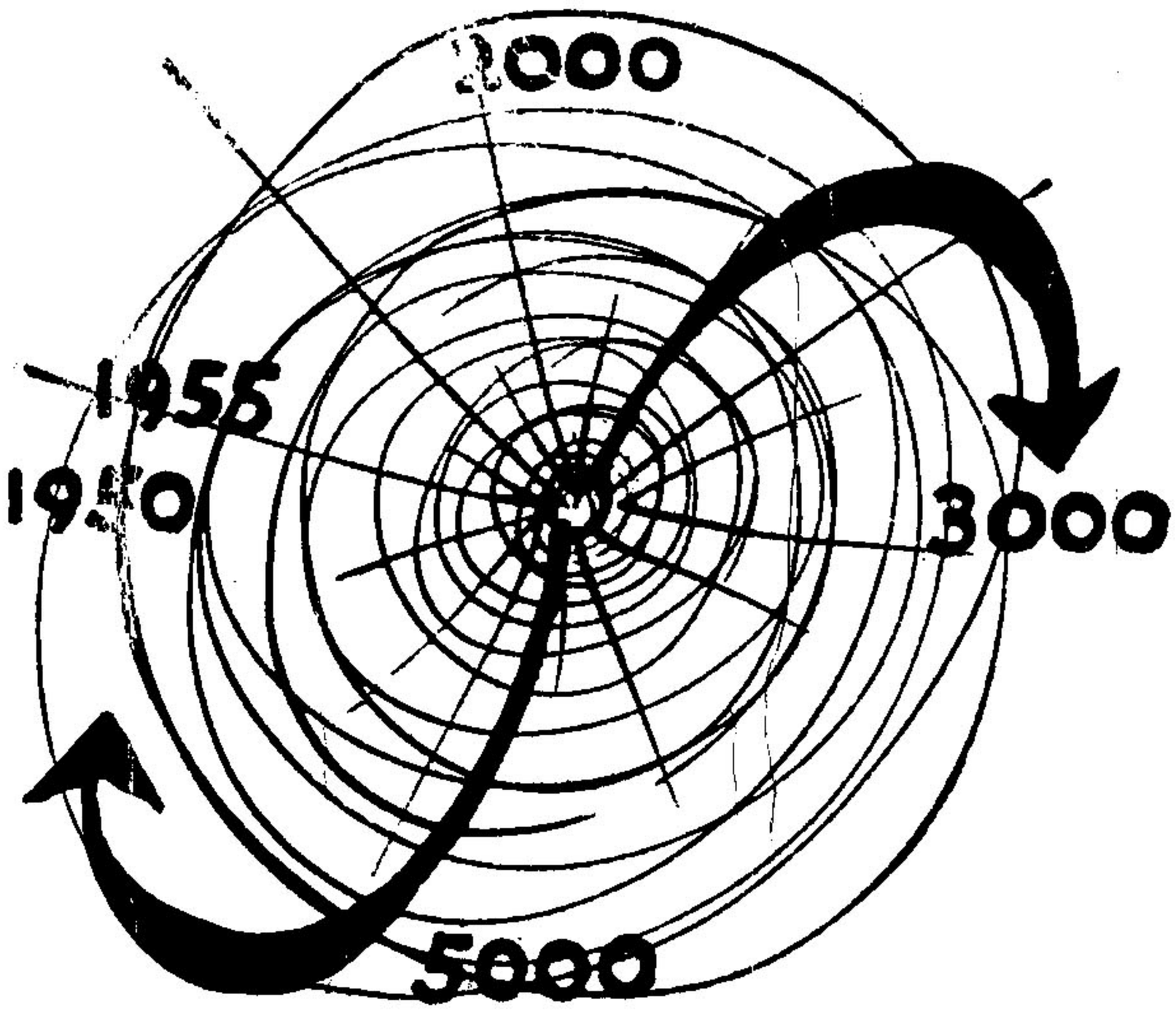

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Article

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SYMBOL: Pressure distribution in closed organo-mechanical system.

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EDITORIAL

A WORD FOR IT

A group of psychologists, anthropologists, sematicists and linguists is setting up a highly interesting project to study the oft-made statement that a man cannot think without language.

The project is certainly valid—but I offer a suggestion that might be of some help. They need to include some experts on information theory, and computer-machine encoding specialists.

Agreed in full and without reservation that human thinking involves processes far and away beyond anything computing machines have ever approached. And agreed, also, that information theory is childishly inadequate, as yet, to describe the full sweep and capability of the human mind.

The essence of the point is, however, that no matter how far any science develops—the basic laws, the original starting fundamentals, remain valid. Biochemistry involves the most enormous complexities of subtle reactions—and still, biochemistry also is bound by the law that argon is chemically inert, while fluorine-carbon bonds are so stable as to be dangerous in a biochemical organism.

A human being lifting a one hundred pound sack of flour may involve complexities piled on complexities—neuro-muscular co-ordination networks beyond our present ability to describe, enzyme reactions beyond the farthest reaches of the most advanced biochemist. But the human being will, none the less, fall flat on his face if he ignores the most simple laws of mechanical engineering, and tries to lift that sack without having the center of gravity of the system sack-and-man centered somewhere over a line joining his centers of support. Not even the most magnificent complexity and subtlety can ignore the elemental, simple foundations of natural law.

It doesn't matter what subtleties the human mind is capable of; it's still stuck, solidly and inescapably, with the most fundamental laws of the Universe. Its subtlety lies in ac-

cepting and using those simple basics —not in denying or avoiding them.

A computer doesn't approach the subtlety of a mind—but it does demonstrate the existence of certain fundamental laws of the Universe that are not merely physical, but control a next-order-higher level of reality.

It's easy to say that Newton *discovered* the Law of Gravity, and that Aristotle *invented* logic. That Gravity is a property of the Universe that men discovered, while logic was a thing *invented* by men. But that doesn't make it so. The simple fact that a totally witless machine behaves in a logical manner, that planets follow the laws of logic in their movements, suggests that logic is a level of reality in the Universe that men discovered—not something man invented.

It's frustrating to have to yield one's opinion to someone else; the ancient, surging feeling "I have a right to my own opinion!" resents that necessity violently. O.K., friend, your opinion may, indeed, be just as good as mine . . . but is it as good as the Universe's? The cultural group was able to apply pressure that forced Galileo to retract his stated opinion, and that proved his opinion wasn't as good as theirs, didn't it? Winning the argument is not equivalent to proving yourself the better and righter man. You may, in the more general terms of the Universal Laws, simply be the more bigoted and stupid man.

Logic — Aristotelian, two-valued logic—represents not a human invention, but a human description of a level of the reality of the universe. Tangible reality, such as matter, is one obvious level of reality; the reality of pure field forces—electric, gravitic, magnetic, et cetera—is an intangible level of reality, but a more fundamental reality, in many senses, than the less subtle reality of matter.

Aristotelian (or two-valued or scholastic, or what-name-do-you-like-to-give-it?) logic is the elementary level of a third level of Universal Reality—its subject is study of the reality of relationships. The very primitive tribesman says "It is . . . and it is—and it is . . ." and names individual entities. The relationship between entities escapes his consciousness; he may have names for oaks, pines, maples, birches, but no term "tree." He will, in his social organization, have ten thousand small rituals and taboos—but no recognition that a certain group of rituals are related derivations from a general rule, just as he does not recognize that all the individual trees are special derivations from the class "tree."

One of the great problems in asking someone to "face reality" is the difficulty that, if you demand that of me, I have a right to demand that you define "reality." The small child may say "Give me that!" and point, with wildly waving hand, at the table-top laid for dinner. When "that" isn't given to him, he may burst into violent angry tears, torn by the intense frustration, the deep

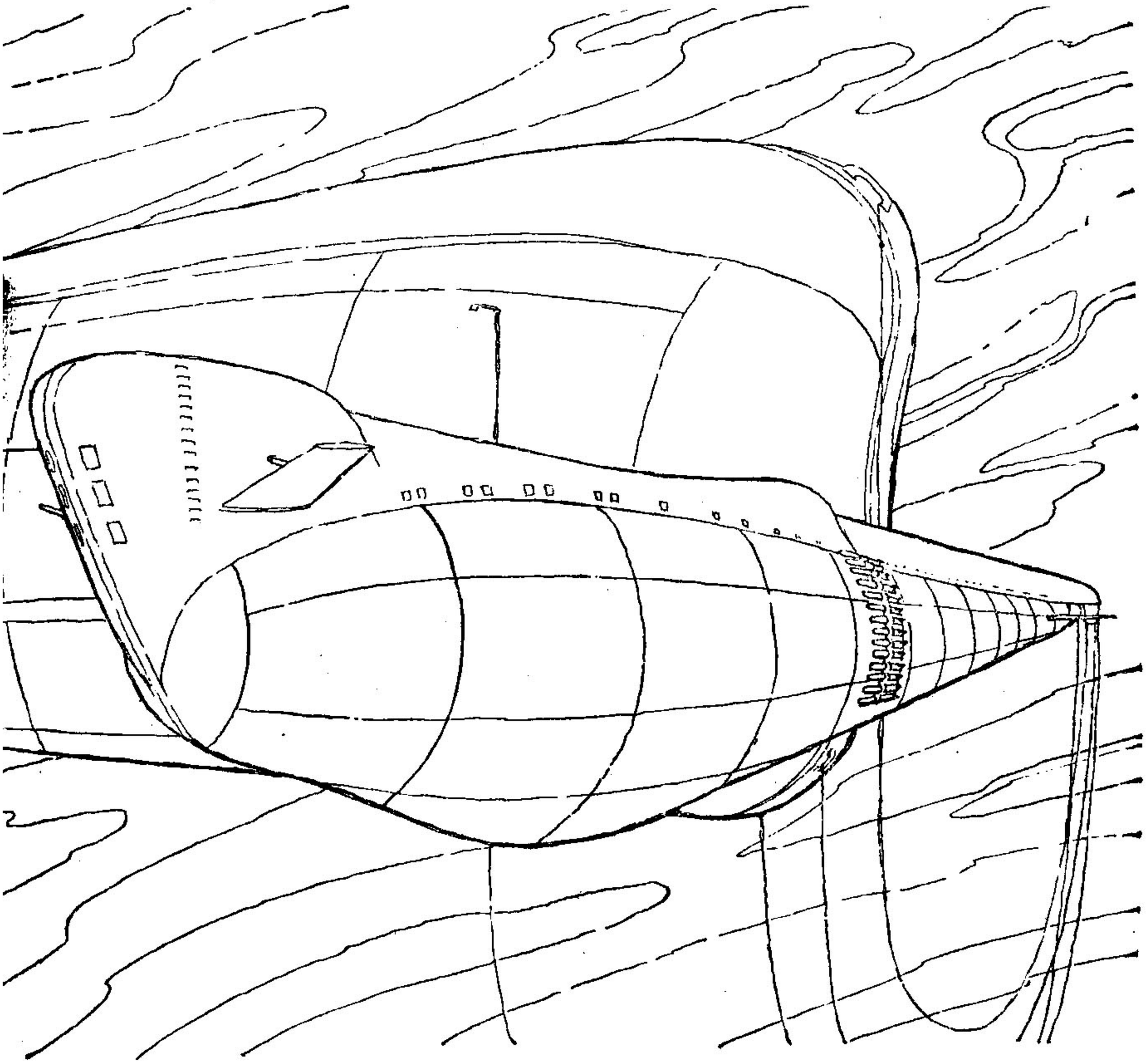
(*Continued on page* 158)

UNDER PRESSURE

BY FRANK HERBERT

First of Three Parts. *A mile down under the eternal night of the deep sea, the men in the subtugs found the pressure wasn't all physical. Particularly when they knew there was a saboteur aboard!*

Illustrated by van Dongen



The blond WAVE secretary at the reception desk took the speaker cup of a sono-typer away from her mouth, bent over an intercom box.

"Ensign Ramsey is here, sir," she said.

She leaned back, stared up at the red-headed officer beside her desk. His collar bore the zigzag of electronics specialist over the initials BP —Bureau of Psychology. He was a tall man, round-faced, with the soft appearance of overweight. Freckles spotted his pinkish face, giving him the look of a grown-up Tom Sawyer.

"The admiral's usually a little slow answering," said the receptionist.

Ramsey nodded, looked at the door beyond her. Gold lettering on a heavy oak panel: *CONFERENCE ROOM —Sec-I.* Security-One. Above the clatter of office sounds, he could hear the tooth-tingling hum of a detection scrambler.

Through his mind passed the self-questionings he could never avoid,

the doubts that had made him a psychologist: *If they have a rough job for me, can I do it? What would happen if I turned it down?*

"You can rest that here on the desk," said the receptionist. She pointed to a black wooden box, about a foot on a side, which Ramsey carried under his left arm.

"It's not heavy," he said. "Maybe the admiral didn't hear you the first time. Could you try again?"

"He heard me," she said. "He's busy with a haggle of braid." She nodded toward the box. "Is that what they're waiting for?"

Ramsey grinned. "Why couldn't they be waiting for me?"

She sniffed. "Enough braid in there to founder a subtug. *They* should be waiting for an *ensign*. There's a war on, mister. You're just the errand boy."

A wave of resentment swept over Ramsey. *You insolent snob,* he thought. *I'll bet you don't date anything less than a full commander.* He wanted to say something biting, but words wouldn't come. And—oh, it wasn't worth the trouble.

The receptionist returned the sonotyper cup to her mouth, went back to her typing.

I've been an ensign so long I'll even take lip from a WAVE yeoman, he thought. He turned his back on her, fell to musing. What do they want with me? Could it be that trick on the *Dolphin?* No. Obe would have said. This might be important, though. It could be my big chance.

He heard the receptionist behind him take a sheet of paper from her machine, replace it.

If I got a big assignment and came back a hero, she'd be the kind who'd try to beat Janet's time with me. The world's full of 'em.

Why do they want me in Sec-I?

Obe had just said to bring the telemetering equipment for the remote-control vampire gauge and show up on the Sec-I doorstep at 0200. Nothing more. Ramsey glanced at his wrist watch. A minute to go.

"Ensign Ramsey?" A masculine voice sounded behind him.

Ramsey whirled. The conference room door stood open. A gray-haired line captain leaned out, hand on door. Beyond the captain Ramsey glimpsed a long table strewn with papers, maps, pencils, overflowing ashtrays. Around the table sat uniformed men in heavy chairs, almost like fixtures. A cloud of blue tobacco smoke hung over the scene.

"I'm Ensign Ramsey."

The captain glanced at the box under Ramsey's arm, stepped aside. "Will you come in, please?"

Ramsey skirted the reception desk, entered the room. The captain closed the door, indicated a chair at the foot of the table. "Sit there, please."

Where's the boss? Ramsey wondered. His gaze darted over the room; then he saw Obe: a hollow-cheeked little civilian, straggly goatee, thin bird features, seated between two burly commodores like a prisoner under guard. The little civilian's radiation-blinded eyes stared straight

ahead. The mound of a radar bat-eye box atop one shoulder gave him a curious unbalanced appearance.

Ramsey sat down in the chair indicated, allowed himself an inward chuckle at the thought of the two commodores guarding Dr. Richmond Oberhausen, director of BuPsych. *Obe could reduce them to quivering jelly with ten words.*

The captain who had admitted Ramsey took a chair well down the table. Ramsey moved his black box to his lap, noted eyes following the movement.

Obe has briefed them on my little invention, he thought.

The hum of the detection scrambler was strong in the room. It made Ramsey's teeth ache. He closed his eyes momentarily, blanked off the pain, opened his eyes, stared back at the men examining him. He recognized several of the faces.

Very high braid.

Directly opposite at the other end of the table sat Admiral Belland, ComSec, the high mogul of Security, a steely-eyed giant with hook nose, thin slit of a mouth.

He looks like a pirate, thought Ramsey.

Admiral Belland cleared his throat in a hoarse rumble, said, "This is the ensign we've been discussing, gentlemen."

Ramsey's eyebrows went up a notch. He looked to Dr. Oberhausen's impassive face. The BuPsych chief appeared to be waiting.

"You know this ensign's security rating," said Belland. "It's presumed we can talk freely in front of him. Would any of you care to ask him—"

"Excuse me, please." Dr. Oberhausen arose from between the two commodores with a slow, self-assured movement. "I have not acquainted Mr. Ramsey with any of the particulars of this meeting. In view of the assignment we have in mind, it would appear more humane if we did not treat him like a piece of drygoods." The sightless eyes turned toward Belland. "Eh, admiral?"

Belland leaned forward. "Certainly, doctor. I was just coming to that."

The admiral's voice carried a tone of something between fear and deference.

Ramsey thought: *Obe is running this meeting pretty much as he wants, and without these birds being certain they're outmaneuvered. Now, he wants me to pick up a cue and help him apply the clincher.*

Dr. Oberhausen sank back into his chair with a stiff, sticklike gesture. A punctuation.

Belland's chair rasped on the floor. He got to his feet, went to the side wall at his left, indicated a north polar projection map. "We've lost twenty subtugs in these waters over the past twenty weeks," he said. He turned to Ramsey, altogether like a school teacher about to propound a problem. "You're familiar with our pressing need for oil? Mineral lubricants—not vegetable oils?"

Familiar? Ramsey restrained a wry smile. Through his mind sped the almost interminable list of regula-

tions on oil conservation: inspections, issuance forms, special classes, awards for innovations. He nodded.

The admiral's bass rumble continued: "For almost two years now we've been getting extra oil from reservoirs under the marginal seas of the Eastern Powers' continental shelf." His left hand made a vague gesture over the map.

Ramsey's eyes widened. *Then the rumors were true: the subservices* were *pirating enemy oil!* It was a nice trick—but dangerous.

"We developed an underwater drilling technique working from converted subtugs," said Belland. "A high-speed, low-friction pump and a new type of plastic barge complete the general picture."

The admiral's mouth spread into what he probably imagined as a disarming grin. It succeeded only in making him appear more piratical. "The boys call the barge a *slug,* and the pump is a *mosquito.*"

Dutiful chuckles sounded through the room. Ramsey smiled at the forced response, noted that Dr. Oberhausen maintained his reputation as Old Stone Face.

Admiral Belland said, "A *slug* will carry almost one hundred million barrels of oil. The EPs know they're losing oil. They know how, but they can't always be sure of where or when. We're outfoxing them." The admiral's voice grew louder. "Our detection system is superior. Our silencer planes—"

Dr. Oberhausen's brittle voice interrupted him. "Everything we have is superior except our ability to keep them from sinking us."

The admiral scowled.

Ramsey picked up his cue, entered the breach. "What was the casualty percentage on those twenty subtugs we lost, sir?"

An owl-faced captain near Belland said dryly, "Of the last twenty missions, we lost all twenty."

"One hundred per cent," said Dr. Oberhausen. The sightless eyes seemed to look across the room at a beet-faced lieutenant commander. "Commander Turner, would you show Mr. Ramsey the gadget your boys found?"

The lieutenant commander pushed a black cylinder about the size of a lead pencil down the table. Hands carried the object along until it reached Ramsey. He studied it.

"Mr. Ramsey's work, of course, involves electronics," said Dr. Oberhausen. "He's a specialist with the instruments used for detecting traumatic memories."

Ramsey caught this cue, also. He was the omniscient BuPsych electronics expert. The Man Who Knows Your Innermost Thoughts. Ergo: you don't have Innermost Thoughts in this man's presence. With an ostentatious gesture, Ramsey put his black box onto the table. He placed the cylinder beside it, managing to convey the impression that he had plumbed the mysteries of the device and found them, somehow, inferior.

What the devil is that thing? he wondered.

"You've probably recognized that

as a tight-beam broadcaster," said Belland.

Ramsey glanced at the featureless surface of the black cylinder. *What would these people do if I claimed X-ray vision?* he asked himself. *Obe must have hypnotized them.*

Belland transferred his tone of deference-fear to Ramsey. "The EPs have been getting those things aboard our subtugs. We think there's a delayed action device which turns them on at sea. Unfortunately, we've been unable thus far to dismantle one without exploding the anti-tamper charge."

Ramsey looked at Dr. Oberhausen, back to Belland, conveying without words: "Well, if they'd turn these problems over to BuPsych—"

The admiral rallied some of his Pride of Department, said, "Turner believes he has it solved, however."

Ramsey looked at the beet-faced lieutenant commander. *And you'll be a rear-rank swabby if you fail,* he thought. The lieutenant commander tried to make himself inconspicuous.

The commodore to Dr. Oberhausen's right said, "Enemy agents aboard the tugs could be turning them on."

Dr. Oberhausen said, "To make a long story short, these devices have been leading the enemy to our secret wells."

"The real trouble," said Belland, "is that we're shot through with sleepers—people the EPs planted years ago—long before the war—with orders to wait for the right moment. People in the damndest places." He scowled. "Why, my driver—" He fell silent, turned the scowl on Ramsey. "We're reasonably certain you're not a sleeper."

"Reasonably certain?" asked Ramsey.

"I am reasonably certain no one in this room is a sleeper," growled Belland. "But that's all I am." He turned back to the wall map, pointed to a position in the Barents Sea. "This is the island of Novaya Zemlya. Off the west coast is a narrow shelf. The edge is in aboult one hundred fathoms. It's steep. We've a well into the flank of that shelf tapping one of the richest oil reservoirs we're ever encountered. The EPs don't even know it's there . . . yet."

Dr. Oberhausen put a bony hand on the table, tapped a finger once. "We must make certain Mr. Ramsey understands the morale factor." He turned toward Ramsey. "You understand that it has been impossible to keep our losses completely secret. As a result, morale in the subtugs has dropped off to almost nothing. We need *good* news."

Belland said, "Turner, take it from there." The admiral returned to his chair, lowered himself into it like a battle wagon settling into drydock.

Turner focused watery blue eyes on Ramsey, said, "We've screened, screened and re-screened our subtug crews. We've found one that looks good. They're at Garden Glenn Rest Camp now and will be coming out in five weeks. However, they do not have an electronics officer."

Ramsey thought, *Great Grieving*

Freud! Am I going to be palmed off as a submariner?

As though he had read Ramsey's thought, Dr. Oberhausen said, "That is where you come in, Ramsey." He nodded to Turner. "Please forgive me, commander, but we're taking too much time with this."

Turner shot a glance at Belland, sank back into his chair. "Of course, doctor."

Dr. Oberhausen arose, again with that air of vast assurance. "This is my field, anyway. You see, Ramsey, the previous electronics officer suffered a psychotic blowup at the termination of their last mission. It's the same problem you were working on with the men of the *Dolphin.* Amplified. The subtugs are smaller, a complement of only four men. The focal symptoms point to a kind of induced paranoia."

"The captain?" asked Ramsey.

"Precisely," said Dr. Oberhausen.

We are now impressing the natives with our mysterious knowledge, thought Ramsey. He said, "I noticed similar conditions in the battle fatigue syndrome when I was on the *Dolphin.*" He patted the box in front of him. "The captain's emotional variations were reflected in varying degrees all through the ship's personnel. And there was a tendency toward emotional feedback."

"Dr. Oberhausen outlined your work with the men of the *Dolphin,*" said Turner.

Ramsey nodded. "I'm troubled by one point here. You say this crew rates high. That doesn't check if the captain is a borderline psychotic."

"Again, that's where you come in," said Dr. Oberhausen. "We were about to beach this captain. But now Battle-Comp tells us he and his crew have far and away the highest chance of success in this mission to Novaya Zemlya. But only if certain other conditions are present." He paused, tugged at an earlobe, apparently in deepest thought.

Ramsey caught the signal, thought, *Ah, there's the bite. Somebody important hasn't agreed to this arrangement and it's vital to Obe that I get on that subtug crew. Who are we playing to? The admiral? No, he'd go himself if Obe said the word.* Ramsey's eyes abruptly caught the scowling glare of the commodore on Dr. Oberhausen's left, and at the same moment he noted for the first time the tiny sunburst on the commodore's collar. *A Presidential aide! That would be the one.*

"One of the other conditions would be that they have secret psychological monitoring," said Ramsey. "How had you planned to link my remote control vampire gauge to this pivotal captain without his knowing?"

"An ingenious solution has been proposed by Admiral Belland," said Dr. Oberhausen. "Security has a new type of detector to combat those spy-beam transmitters. A speaker pellet is surgically imbedded in the neck and tuned to wave scanners which are similarly imbedded beneath the armpits. Micro-instrumentation would

permit us to include with the speaker the recorders you'd need."

Ramsey nodded toward the admiral. "Clever. You'd rig this subtug skipper that way, send me along to keep him in balance."

"Yes," said Dr. Oberhausen. "However, there has been some objection raised." The sightless eyes seemed to peer down at the commodore on his left. "On the grounds that you have no extended deep-tug combat experience. It's a specialized service."

The commodore grunted, glared at Ramsey. "We've been at war sixteen years," he said. "How is it you've escaped combat?"

Old school tie, thought Ramsey. He turned his telemeter box until one flat surface faced the commodore, squinted at the officer over it. *When in doubt, fire a broadside.*

"Every man we preserve for combat brings victory that much nearer," said Ramsey.

The commodore's leathery face grew dark.

"Mr. Ramsey has a special combination of training—psychology and electronics—which have made him too valuable to risk," said Dr. Oberhausen. "He has made only the most essential cruises—such as that with the *Dolphin*—when that was absolutely required."

"If he's so valuable, why're we risking him now?" demanded the commodore. "This all seems highly irregular!"

Admiral Belland sighed, stared at the commodore. "The truth is, Lewis, this new emotional telemetering equipment which Mr. Ramsey developed can be used by others. However, his inventive talents are the very things which make his services so essential at this time."

"You may think me rude," said the commodore, "but I'd like to know also why this young man—if he's as good as all that—is still" . . . he flicked a glance at Ramsey's collar bars, "an ensign."

Dr. Oberhausen held up a hand, said, "Permit me, my dear admiral." He turned to the commodore. "It is because there are people who resent the fact that I have been able to keep myself and my top department heads out of uniform. There are those who do not see the necessity for this essential separation. It is regrettable, therefore, that those of my people in the lower echelons, who are required to wear uniform, sometimes find it difficult to gain advancement no matter how talented they may be."

The commodore looked as though he were about to explode.

"By rights," said Dr. Oberhausen, "Mr. Ramsey should be at least a commodore."

Several fits of coughing broke out simultaneously around the table.

Ramsey suddenly wished he were anywhere else but under the eyes of this commodore. The latter said, "Very well, my objection is withdrawn." The tone of voice said: *I will pass sentence in my own court.*

"I have planned," said Dr. Oberhausen, "upon completion of this

mission, to have Mr. Ramsey released from the service and installed as head of a new department devoted to problems of submariners."

A harsh smile pulled at the corners of the commodore's mouth. "If he lives through it," he said.

Ramsey swallowed.

"The training will be a problem," said Dr. Oberhausen. "But we have five weeks plus the full facilities of BuPsych."

Belland heaved his bulk from the chair, stepped to one side. "If there are no more questions, gentlemen, I believe we are all satisfied with Mr. Ramsey." He glanced at his wrist watch. "The medics are waiting for him now, and he's going to need every minute of the next five weeks."

Ramsey got to his feet, took his telemeter box under his arm, a question in his eyes.

"You're also going to be rigged as a walking detection system," said Belland.

Dr. Oberhausen appeared to materialize beside Ramsey. "If you'll come with me, please, John." He took Ramsey's arm. "I've had the essential material about Commander Sparrow —he's the captain of this subtug— and the other two crewmen reduced to absolute minimum. We've set aside a special ward at the Bureau for you. You're going to be our prize patient for—"

Ramsey heard Turner speaking behind him. "Dr. Oberhausen called that ensign John. Is he the *Long John* Ramsey who—"

The rest was blurred as Dr. Oberhausen raised his voice. "It's going to be rough on you, John." They stepped into the outer corridor. "Your wife has been notified." Dr. Oberhausen lowered his voice. "You handled yourself very well in there."

Ramsey suddenly realized that he was allowing himself to be guided by a blind man. He laughed, found that he had to explain the laughter. "It was the way you handled that brassy commodore," he said.

"You don't lie at all well," said Dr. Oberhausen. "But I'll let it pass. Now, about the commodore: He's a member of the board which passes upon promotions for BuPsych men."

Ensign Ramsey abruptly found that laughter had left him.

Ramsey often referred to his five weeks' training for the subtug mission as "The time I lost twenty-five pounds."

They gave him three rooms in the south wing of Unadilla Naval Hospital: blank white enclosures furnished in rattan and cigarette-scarred mahogany, a functional TV set, equally functional hospital bed on high legs. One room was set up for training: hypnophone, wall diagrams, mock-ups, tapes, films.

His wife, Janet, a blond nurse, received a week-end schedule for visits: Saturday nights and Sundays. Their children, John Junior, age 2, and Peggy, age 4, were not permitted in the hospital, had to be packed off to their grandmother's at Fort Linton, Mississippi.

Janet, wearing a one-piece red

dress, came storming into the sitting room of Ramsey's suite on their first Saturday night. She kissed him, said, "I knew it!"

"Knew what?"

"That sooner or later the Navy and that awful Obe would be regulating our life."

Ramsey, aware that everything he said and did in the hospital was being monitored, tried to shush her. She was not shushable.

"Oh, I know they're listening," she said. She threw herself onto the rattan couch, crossed her legs, lighted a cigarette which she puffed furiously. "That Obe gives me the creeking creeps," she said.

"That's because you let him," said Ramsey.

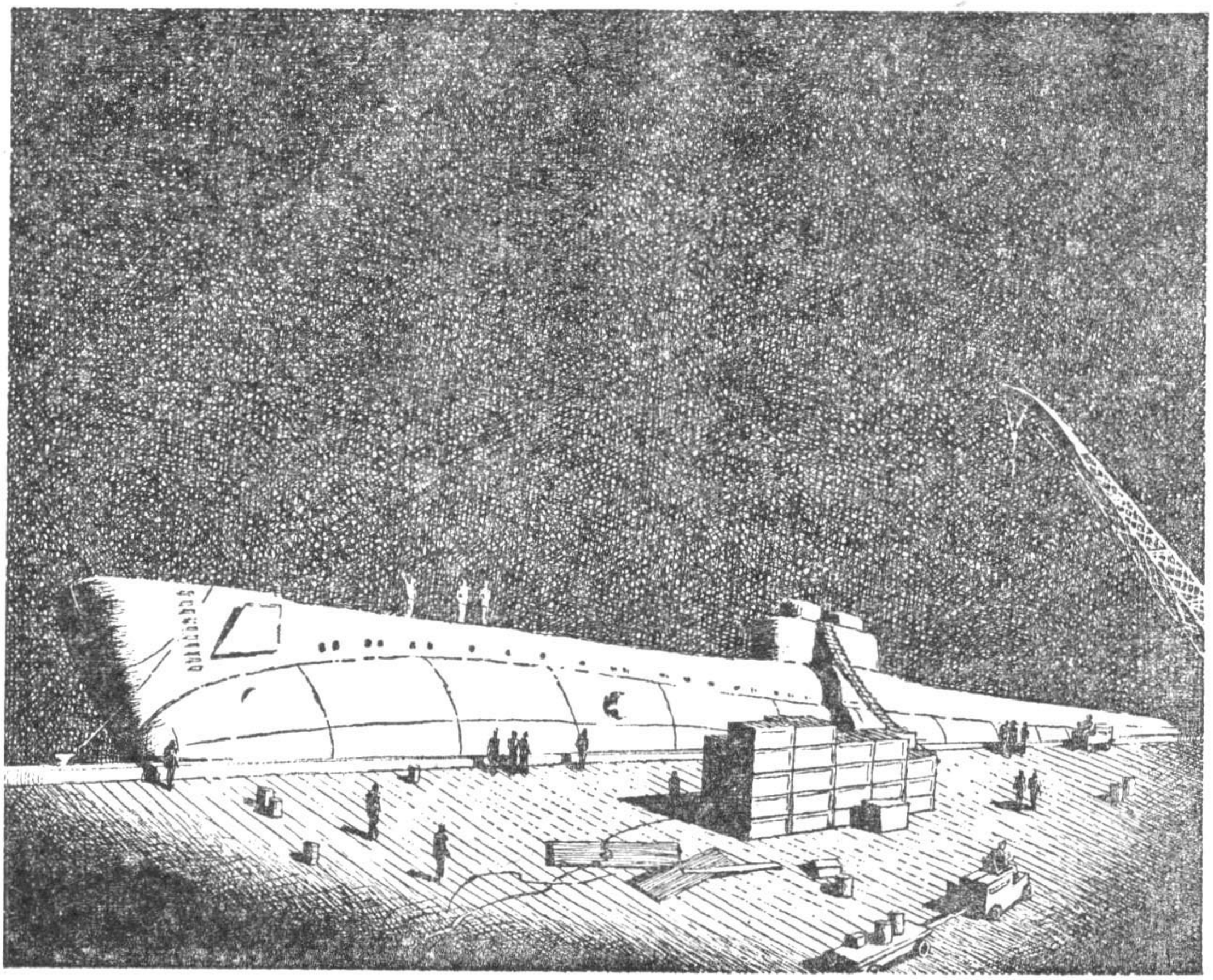
"And because that's the effect he wants to give," she countered. She was plainly annoyed.

"Well . . . yes," admitted Ramsey.

Janet jumped to her feet, threw herself into his arms. "Oh, I'm being a fool. They said I wasn't to upset you."

He kissed her, rumpled her hair. "I'm not upset."

"I told them I couldn't upset you if I tried." She pushed away from him. "Darling, what is it this time? Something dangerous? It isn't another one of those horrible submarines?"



"I'm going to be working with some oil men," he said.

She smiled. "Oh, that doesn't sound bad at all. Will you be drilling a well?"

"The well's already drilled," he said. "We're going to see about increasing production."

Janet kissed his chin. "Old efficiency expert."

"Let's go to dinner," he said. "How're the kids?"

They went out, arm in arm, chatting about the children.

Ramsey's weekday routine began at 0500 when the nurse entered with his wake-up shot to rouse him from the hypnophone drugs. High protein breakfast. More shots. Blood test.

"This is going to hurt a little."

"Owooooooch! Whatta y' mean a little? Next time warn me!"

"Don't be a big baby."

Diagrams. Floor plans of Hell Diver Class subtugs.

They turned him over to a large subtug expert from Security. Clinton Reed. Bald as an egg. Thin eyes, thin nose, thin mouth, thick skin. Sense of duty as solid as his neck. Absolutely no sense of humor.

"This is important, Ramsey. You have to be able to go anywhere on this vessel, man any control blindfolded. We'll have a mock-up for you in a couple of days. But first you have to get a picture of it in your mind. Try flashing these plans and then we'll test your memory."

"O.K. I've flashed the general layout. Try me."

"Where's the pile room?"

"Ask me something hard."

"Answer the question."

"Oh, all right. It's forward in the bulb nose; first thirty-two feet."

"Why?"

"Because of the teardrop shape of this class, and for balance. The nose gives the most room for shielding."

"How thick is the radiation wall behind the pile room?"

"I missed that."

"Twelve feet. Remember it. Twelve feet."

"Well, I can tell you what it's made of: hafnium, lead, graphite and poroucene."

"What's on the aft face of the radiation wall?"

"Direct-reading gauges for the reactor. Repeaters in the control room, forward bulkhead, to the right of the first-level catwalk. Then there are lockers for ABG suits, tool lockers, doors to the tunnels leading into the pile room."

"You're getting it. How many tunnels into the pile room?"

"Four. Two top; two bottom. Not to be entered for more than twelve minutes at a time unless wearing an ABG suit."

"Fine. What's the rated horsepower?"

"Two hundred and seventy-three thousand, reduced to about two hundred and sixty thousand by the silencer planes behind the screw."

"Excellent! How long is the engine room?"

"Uh . . . nope. That one's gone, too."

"Look, Ramsey, these are important. You have to remember these distances. You have to get a feeling for them. What if you don't have any lights?"

"O.K. O.K. How long is it?"

"Twenty-two feet. It fills the whole midship section. The four electric engines are set two to a level with the gear box for the drive below center aft."

"Gotcha. Here, let me take a flash of the aft section. O.K. Now try me."

"How many catwalks in the engine room and where located?"

"Look, I just flashed the aft section."

"How many catwalks and—"

"O.K. Let's see: one center of the control deck going forward. One off center into machine stores on the second-level below. One called A-level into top stores. Same for bottom level: called B-level. Short bridging catwalks from A and B levels to the engines and oxy tanks. And one very short to the conning tower retracted which lifts into a section of steps when the tower is extended."

"Good. You see, you can do this if you set your mind to it. Now, tell me how the four staterooms are placed."

"Staterooms yet."

"Stop dodging the question."

"Wise guy! Let's see: Captain is top level starboard behind the electronics shack. First officer port side behind the recreation room-sickbay. Engineering officer starboard below the captain's quarters and behind the machine shop. Electronics officer port side below the first officer and aft of galley stores. That's the place for me. Gonna cut me a private door into galley stores."

"Where's the galley?"

"Now that one I can answer. It's far port, top level, entered through the wardroom. Selector controls for the prepackaged meals are against the bulkhead separating galley and wardroom. The galley-wardroom unit is between control deck and rec room."

"What's behind the staterooms?"

"Machinery of the Palmer induction drive."

"Why an induction drive?"

"Because at the dive limit for Hell Divers, there can be no weak points in the hull, therefore no shaft through the hull."

"You're getting the drive on the hypnophone tonight. Every man on a Hell Diver is supposed to be able to strip and reassemble it blindfolded. There'll be a model for you to work on day after tomorrow."

"Oh, goody!"

"What's the pressure hull limit for Hell Divers?"

"Three thousand and ten pounds to the square inch or seven thousand feet."

"Stick to your first answer. Pressure varies with different water conditions. You'd be O.K. at seventy-one hundred feet in one place, dead at sixty-nine hundred another. Learn to depend on your static pressure gauge. Now, let's go to the atmosphere composition. What's a vampire gauge?"

"A little device worn on your wrist

during deep dives. Needle goes into your vein, tells you if your CO_2 diffusion is fast enough so you won't crock out. It also tattles on nitrogen."

"What's minimum diffusion?"

"When you get below point two hundred on CO_2 you get the jeebles. If your blood CO_2 count goes to four per cent you're in trouble. With nitrogen it's different. The subtug atmosphere is supposed to be entirely cleared of it. A small quantity of helium is substituted."

"How do you get by with the high atmospheric pressure?"

"Aerobic carbonic anhydrase is fed into the atmosphere by the ventilator system. This speeds up the CO_2 loading and unloading of the blood, prevents gas bubbles forming."

"You're good on that. Did you know it before?"

"My emotional telemeter is just a glorified vampire gauge."

"Oh, sure. Now, why is the electronics officer so important?"

"Contact with the exterior control motors is by coded wave-pulse. If the E-system breaks down when a subtug is submerged, it stays submerged."

"Right. Now, let's go through the plans again."

"Not again!"

"Start with the reactor room. In detail."

"Slave driver!"

The nightly hypnophone sessions flooded Ramsey's mind with the new knowledge: pressure hull, resonating hull, tank hull . . . pressure compensating system . . . header box . . . reactor controls . . . search and sounding . . . diving plane controls . . . valve controls . . . pile check-off . . . sonoran automatic navigation board . . . atmosphere controls . . . automatic timelog, Mark IX . . . external and internal TV eyes, specifications for servicing of . . . gyro controls . . . tow controls . . . plastic barge, oil, components of . . . needle torpedoes, external racking system . . . torpedo homing systems . . . scrambler systems . . . systems . . . systems . . . systems . . .

There were times when Ramsey's head felt filled to the bursting point.

Dr. Oberhausen appeared in Ramsey's quarters on the fourth day of training. The doctor's unpressed clothes gave him the appearance of a bedraggled robin. He came in quietly, sat down beside Ramsey who was seated in a viewer-scope sequence-training hookup.

Ramsey pulled the fitted faceplate away from his eyes, turned to Dr. Oberhausen. "Ah, the chief of the inquisition."

"You are comfortable, Johnny?" The sightless eyes seemed to stare through him.

"No."

"Good. You are not supposed to be comfortable." The doctor's chair creaked as he shifted his weight. "I have come about the man Garcia who is engineering officer of this crew."

"What's wrong with him?"

"Wrong? Have I said anything was wrong?"

Ramsey completely disengaged the

viewer-scope, sat back. "Come to the point."

"Ah, the impatience of youth." Dr. Oberhausen sighed. "Do you have a file on Garcia?"

"You know I have."

"Get it, please, and read me what you have."

Ramsey leaned to his right, took a file folder from the bottom ledge of his coffee table, opened it. Garcia's picture on the inside front cover showed a short man—about five feet seven inches—slim. Latin features—dark. Black curly hair. Sardonic half-smile. The picture managed to impart a sense of devil-may-care. Under the photograph a note in Ramsey's handwriting: "Member Easton championship water polo team. Likes handball."

"Read to me," said Dr. Oberhausen.

Ramsey turned the page, said: "Age thirty-nine. Came up from the ranks. Ex-CPO machinist. Ham radio license. Born Puerto Madryn, Argentina. Father cattle rancher; Jose Pedro Jesus Garcia y Aguináldo. Mother died at birth of daughter when Garcia age three. Religion: Catholic. Wears medal on a chain around neck. Takes blessing of priest before each mission. Wife: Beatrice, age thirty-one."

"Do you have her picture?" asked Dr. Oberhausen.

"No."

"A pity. I am told she is quite beautiful. Continue, please."

Ramsey said: "Educated at New Oxford. That accounts for his British accent."

"I grieved when the British Isles were destroyed," said Dr. Oberhausen. "Such a lovely culture, really. So basically solid. Immovable. But that is a weakness, also. Continue, if you please."

"Plays bagpipes," said Ramsey. He looked at the doctor. "Now there's something: a Latin-American playing the bagpipes!"

"I see nothing wrong with that, Johnny. For certain moods, nothing is more soothing."

Ramsey raised his gaze to the ceiling. "Soothing!" He looked back at the BuPsych chief. "Why am I reading this?"

"I wanted to get the full flavor of Garcia in mind before imparting the latest morsel from Security."

"Which is?"

"That Garcia may be one of these *sleepers* who are giving Security so many *sleepless* nights."

Ramsey snorted. "Garcia! That's insane! As well suspect me!"

"They are still investigating *you*," said Dr. Oberhausen. "As to Garcia—perhaps; perhaps not. Counter-Intelligence has turned up the description of a sleeper supposed to be in the subtugs. The description fits Garcia. Security almost called off the mission. I convinced them to go ahead by suggesting that you be primed to watch Garcia."

Ramsey returned to the color photograph in his file folder, observed the sardonic smile. "I say we're chas-

ing shadows. And that may be what the EPs really want. If it's carried to its illogical extreme, certain Security-thinking is first cousin to paranoia—dementia praecox type."

Dr. Oberhausen lifted himself from the rattan chair. It gave off a reedy creaking. "Do not say that to the Security gentlemen when they come to brief you on Garcia," he said. "Oh, and one other thing: The commodore is sharpening knives with which to carve you if there is some error on this mission."

"I have you to thank for that," said Ramsey.

"I take care of my own," said Dr. Oberhausen. "Fear not on that score." He waved toward the viewer-scope. "Continue with your studies. I have other work."

Ramsey waited for the door to close, threw the file folder back onto the coffee table, took twenty deep breaths to calm his nerves. Presently, he leaned to his right, captured the folders on the other two crew members, scanned them:

Commander Harvey Acton Sparrow. Age 41. Picture of a tall, thin man with balding sandy hair, a face of sharp planes; stooped shoulders.

He looks like a small-town college professor, thought Ramsey. *How much of that is conditioned on his early desire to teach mathematics? Does he resent the fact that his hard-crust Navy family forced him to follow in the Old Man's footsteps?*

Father: Rear Admiral Acton Orwell Sparrow, lost with Subcruiser Plunger in Battle of Irish Sea, October 16, 2018.

Mother: Genene Cobe Sparrow. Invalid (heart), lives at Watters Point Government Rest Home.

Wife: Rita. Age 36. Blond. Childless.

Does Sparrow know that his wife is unfaithful? Ramsey asked himself. *Most of their friends are aware of it.*

Qualifications: navigator—superior; gunnery officer—superior; medical officer (advanced first aid and pressure syndrome)—excellent; general submarine competence—superior.

Lt. Commander Leslie (none) Bonnett. Age 38. Picture of a heavy-bodied man (just under six feet) with brown wavy hair (artificial wave?), aqualine nose, overhanging eyebrows, the look of a brooding hawk.

Orphan-foundling. Raised at Cape Neston Home for the Unwanted.

For the Unwanted! thought Ramsey.

Married four times. Two children—one by each of first two wives. Maintains marriage relationship with wife number four: Helene Davis Bonnett. Age 29. Miss Georgia of 2021.

The Unwanted, thought Ramsey. *He's carrying out an unconscious revenge pattern against women, getting even with the mother who deserted him.*

Qualifications: navigator—good; supply officer—excellent; gunnery officer—superior (top torpedo officer of subtugs four years running); gen-

eral submarine competence—excellent plus.

Ramsey looked at the note in the psych record: "Held from advancement to his own command by imperfect adjustment to deep-seated insecurity feelings."

The Unwanted, he thought. *Bonnett probably doesn't want advancement. This way, his commander supplies the father-authority lacking in his youth.*

Ramsey tossed the folders back onto the coffee table, leaned back to think.

An association of twisted and tangled threads.

Sparrow and Bonnet were Protestants, Garcia a Catholic.

No evidence of religious friction.

These men have evolved a tight-worknig arrangement. Witness the fact that their subtug has the highest efficiency rating in the service.

What has been the effect of losing Heppner, the other electronics officer? Will they resent his replacement?

Damn! Heppner was the wrong one to go! A case history with no apparent clues. Quiet childhood. Calm home life. Two sour notes: a broken love affair at age 24; a psychotic blowup at age 32. It should have been someone like Bonnett. The Unwanted. Or Captain Sparrow. The frustrated mathematician.

"Sleeping?"

It was Reed, the constant tutor.

"It's three o'clock," he said. "I brought a layout plan of the electronics shack on these Hell Divers." He handed a blueprint to Ramsey, pointed as he spoke. "Bench here. Vise there. Wrench kit. Micro-lathe. Vacuum pumps. Testing board plugs."

"O.K., I can read."

"You have to be able to plug into that test board in total darkness," said Reed. He sat down squarely in the rattan chair lately occupied by Dr. Oberhausen. "Tomorrow you're going to start training on a mock-up."

"Tomorrow's Saturday, Clint!" Ramsey glared at him.

"You don't get out of here before oh-six-hundred," said Reed. He bent forward over the plan. "Now, concentrate on that plug layout. This here is emergency lighting. You'll be expected to find it the first time."

"What if it takes me two tries?"

Reed leaned back, turned his flinty gaze on Ramsey. "Mr. Ramsey, there is something you should understand so thoroughly that it's second nature to you."

"Yeah? What's that?"

"There is no such thing as a *minor* accident on a submarine."

Commander Sparrow trotted down the ramp from the tube landing, slowed as he stepped into the cavernous, floodlighted gloom of the underground submarine moorage. A fine mist of condensation from the rock ceiling far away in upper blackness beat against his face. He picked his way through the pattern of scurrying jitneys, darting-intent people. Ahead of him, the bulbous whale-mound of his subtug rose above the pier: a 140-foot Wagnerian diva center-stage beneath banks of floodlights.

Instructions from the final security session jangled through his mind.

"Your crew has the top security rating of the service, but you must remain alert for sleepers."

"In my crew? Hell, man, I've known them all for years. Bonnett's been with me eight years. Joe Garcia and I served together before the war. Heppner and—" His face had crimsoned. "What about the new E-officer?"

"You won't need to worry about him. Now, the inspectors assure us there are no enemy signal devices aboard your ship."

"Then why this gadget in my neck?"

"That's just an added precaution."

"What about this new man? What is his E-rating?"

"He's one of the best in the service. Here, look at his record."

"Limited combat experience in Gulf Patrol! He's practically a dryback!"

"But look at his E-rating."

"Limited combat!"

A jitney driver shouted at Sparrow, bringing him out of his reverie. He glanced at his wrist watch: 0738—twenty-two minutes until castoff. His stomach tightened. He quickened his steps.

Damn Security's last minute details!

Across the ebony velvet of the mooring pool he could see the glow tubes outlining the marine tunnel. Down the 160-mile slant of that tunnel, out into the underwater deeps of DeSoto Canyon and the Gulf of Mexico—and beyond—ranged The Enemy. An Enemy grown suddenly, terrifyingly one-hundred per cent effective against vessels such as his.

It came to Sparrow that the marine tunnel formed a grotesque birth canal. This cavern carved under a Georgia mountain was nestled in the earth like a fantastic womb. When they took their vessel out to do battle they were born into a terrible world that they did not want.

He wondered what BuPsych would think of an idea like that. *They'd probably rate it as an indication of weakness,* he thought. *But why should not I have a weakness? Something about fighting a war a mile and a half under the ocean—the unrelenting pressure of water all around—exposes every weakness in a man. It's the pressures. Constant pressures. Four men isolated in pressure, held in a plasteel prison as they are held in the prisons of their souls.*

Another jitney scurried across Sparrow's path. He dodged, looked up at his ship. He was close enough now to make out the nameplate on the retractable conning tower high above him: *Fenian Ram S1881.* The boarding ramp swooped down from the tower in a long graceful curve.

The dock captain, a moon-faced lieutenant commander in fatigues, hurried up to Sparrow, a check-list in his hands.

"Captain Sparrow."

Sparrow turned without stopping. "Yes? Oh, hullo, Myers. Are all the ready crews off?"

Myers fell into step beside him.

"Most of them. You've lost weight, Sparrow."

"Touch of dysentery," said Sparrow. "Got some bad fruit up at Garden Glenn. Has my new electronics officer showed up?"

"Haven't seen him. His gear came along earlier. Funny thing. There was a sealed box with his stuff. About so by so." He gestured with his hands. "Cleared by Admiral Belland."

"ComSec?"

"None other."

"Why was it sealed?"

"It's supposed to contain some highly delicate instruments to monitor your new long-range search equipment. It was sealed so no zealous searcher could foul the works."

"Oh. I take it the new long-range gear is installed?"

"Yes. You're battle-checking it."

Sparrow nodded.

A cluster of men at the foot of the boarding ramp snapped to attention as the two officers approached. Sparrow and Myers stopped. Sparrow said, "At ease."

Myers said, "Sixteen minutes, captain." He held out his hand, shook with Sparrow. "Good luck. Give 'em hell."

"Right," said Sparrow.

Myers headed for the foot of the dock.

Sparrow turned toward a heavy-bodied, hawk-faced man beside the ramp, First Officer Bonnett. "Hi, Les."

"Good to see you, skipper," said Bonnett. He tucked a clipboard under his left arm, dismissed three ratings who were with him, turned back to Sparrow. "Where'd you and Rita go after the party?"

"Home," said Sparrow.

"So'd we," said Bonnett. He hooked a thumb toward the submarine behind him. "Final safety inspection's completed. Spare gear checked out. But there's a bit of a delay. Heppner's replacement hasn't reported."

Sparrow cursed inwardly, felt a stomach-gripping surge of frustration-anger. "Where is he?"

Bonnett shrugged. "All I know is that Security called and said there might be some delay. I told them—"

"Security!"

"That's right."

Sparrow barked! "Do they always have to wait until the last minute? They had me—" He broke off. That was classified.

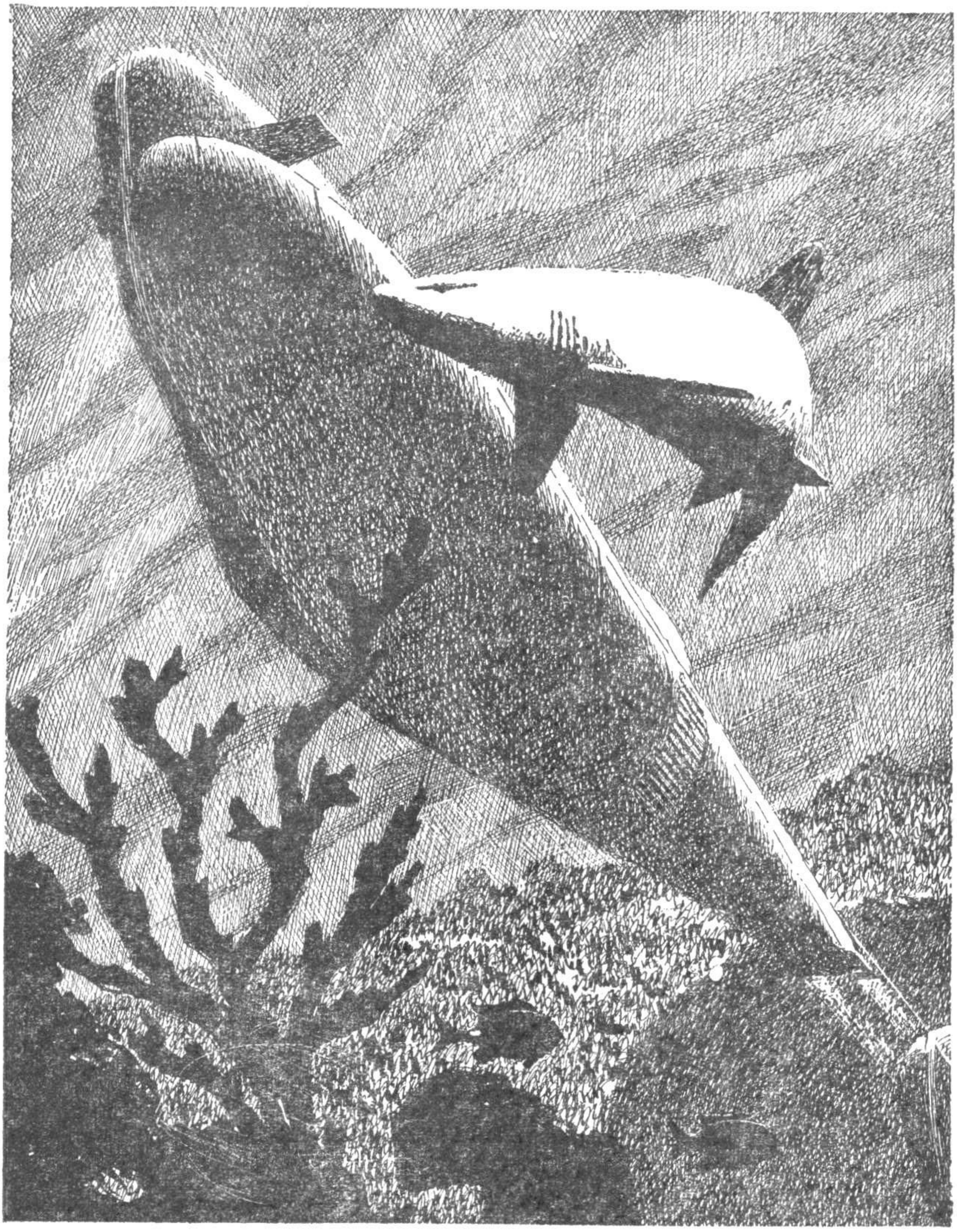
"They said they'd do their best," said Bonnett.

Sparrow pictured the complicated arrangements which would pass the *Fenian Ram* through their own defense network outward bound.

"It could take another day to set up a new passage time."

Bonnett glanced at his wrist watch, took a deep breath. "I told them oh-eight-hundred was the latest. They wouldn't answer even one of my—" He fell silent as the ramp beside them rattled to descending footsteps.

Both men looked up, saw three figures coming down: two ratings carrying heavy-duty electronic detection gear, followed by a short wiry



man with dark Latin features. He wore stained service fatigues, carried a small electronic search box under his right arm.

"Don José Garcia," said Sparrow.

Garcia shifted the search box to his left arm, stepped down to the dockside. "Skipper! Am I glad to see you!"

Sparrow moved back to permit the

ratings to pass with their load, looked questioningly at the search box under Garcia's arm.

Garcia shook his head. "For God and Country," he said. "But sometimes I think I overdraw my account with God." He crossed himself. "The Security chaps have had us at this floating sewer pipe half the night. We've been over it from stem to stern four distinct times. Not a blip. Now, I say to you, they want me to make another search after we get underway down tunnel!" He raised his eyebrows. "I ask you!"

"We'll have to do it," said Sparrow. "I've allowed time before our first contact point for total deep-dive inspection."

"I say," said Garcia. He grinned. "You know, I've already gone and rigged for it."

Sparrow answered the grin, felt some of the tensions inside him begin to unknot.

Bonnett glanced significantly at his watch. "Twelve min—"

The whine of a command jitney's electric motor intruded upon him. All three men turned toward the sound. It came down the dark line of mooring slots, its single light casting an erratic Cyclops gleam upon the damp concrete. The jitney swerved up to the ramp, jerked to a stop. A redheaded man with round, innocent face sat beside the driver, clutching his uniform cap in his hands.

Sparrow saw ensign's bars on the man's collar, thought, *That will be my new E-officer.* Sparrow grinned at the man's obvious relief upon a safe arrival. The recklessness of the base jitney drivers was a standard service joke.

The new man put his cap over his red hair, stepped out of the jitney. The machine rebounded from his weight. The driver whirled the jitney back the way they had come.

The ensign stepped up to Sparrow, saluted, said, "I'm Ramsey."

Sparrow returned the salute, said, "Glad to have you aboard."

Ramsey handed his service record to Sparrow, said, "No time to send these through channels."

Sparrow passed the papers to Bonnett, said, "This is Mr. Bonnett, first officer." He turned to Garcia. "Mr. Garcia, engineer."

"Good to meet you," said Ramsey.

"We'll soon dissuade you of that illusion," said Garcia.

Sparrow smiled, offered his hand to Ramsey, was surprised to feel strong muscle in the new man's grip. The fellow just *looked* soft. Bonnett and Garcia also shook hands.

Ramsey was busy cataloguing his first visual impressions of the three men in the flesh. It seemed strange to be meeting these people for the first time when he felt that he already knew them. And that, he knew, would have to be concealed. Odd bits of knowledge about the personal lives of these men—even the names of their wives—could not be in the memory of a new man.

"Security said you might be delayed," said Sparrow.

"What's got Security on its ear?"

asked Ramsey. "I thought they were going to dissect me."

"We'll discuss that later," said Sparrow. He rubbed at the thin scar on his neck where the Security surgeons had imbedded the detection system speaker. "Castoff is oh-eight-hundred. Mr. Garcia will take you aboard. Get into fatigues. You'll be assisting him in a final spy-beam inspection as we get underway."

"Yes, sir," said Ramsey.

"Your gear came along hours ago," said Garcia. He took Ramsey's arm, propelled him toward the ramp. "Let us get with it." They hurried up the ramp.

Ramsey wondered when he could break away to examine his telemeter box. He felt an anxiety—a need to study the first records on Sparrow.

That mannerism of rubbing his neck, thought Ramsey. *Extreme nervous tension well-concealed. But it shows in the tight movements.*

On the pier, Sparrow turned to look across the mooring basin at a string of moving lights. "Here comes our tow, Les."

"Do you think we'll make it, skipper?"

"We always have."

"Yes, but—"

"For now is our salvation nearer than when we believed," said Sparrow. "The night is far spent, the day is at hand: let us therefore cast off the works of darkness and let us put on the armor of light." He looked at Bonnett. "Paul wrote that to the Romans two thousand years ago."

"A pretty wise fellow," said Bonnett.

A bos'n's whistle sounded at the head of the dock. A swifty crane came darting up to take away the boarding ramp. Ratings hurried to attach the hooks, looked inquiringly at the two officers.

Men still hurried along the pier, but there was a new purposefulness in their movements. Sparrow swept his gaze over the scene. "We're being asked to perform," he said. He gestured for Bonnett to precede him up the ramp. "Like the man said: Let's get with it."

They climbed to the conning tower. Bonnett ducked for the cable rack which mounted the float for their TV-periscope. As a matter of routine, he glanced at the housing, saw that it was secured for dive. He grasped the ladder arms, slid down into the subtug.

Sparrow remained topside. Around him, the mooring basin appeared a vast lake. He looked upward at the rock ceiling's blackness.

There should be stars, he thought. *Men should get one last look at stars before they go under the sea.*

On the pier below, scurrying figures moved to cast off the magnetic grapples. For a moment, Sparrow felt like a useless pawn being thrown into a sacrifice position. There had been a time, he knew, when captains conned their vessels away from the dock, shouting orders through a megaphone. Now, it was all automatic—

done by machines and by men who were like machines.

A surface tug swung up to their bow, slapped its tow grapples onto them. White water boiled from beneath the tug's stern. The *Fenian Ram* resisted momentarily, as though reluctant to leave, then began a slow, ponderous movement out into the basin.

They cleared the slot, and another tug slid up alongside their stern. The magna-shoe men leaped onto the *Ram's* silencer planes, hitched the tow and guide cables of the long plastic tube which stretched out across the dark water of the basin. Their shouts came up to Sparrow in the tower like the clear noise of children. He tasted a sudden oil-tainted breeze and knew they had crossed the path of a ventilator duct.

No special fanfare, no brass bands, no ceremony for the departure of a raider, he thought. *We are as a reed shaken with the wind. And what go we out into the wilderness to see? No John the Baptist awaits us. But it's a kind of baptism all the same.*

Somewhere in the darkness a klaxon hooted. *Turn and identify the man next to you. Another Security scheme: Show your identification when the horn sounds. Damn Security! Out here I identify myself to my God and none other!*

Sparrow looked astern at the set of the tow. *Oil. War demanded the pure substance born in the sediment of a rising continent. Vegetable oil wouldn't do. War was no vegetarian. War was a carnivore.*

The tow tug shifted to the side of the *Ram* and now the sub was being nosed into the traveler rack which would carry it down to the underwater canyon and the Gulf.

Sparrow looked to the control console in the conning tower, saw the green *clear-away* light. He flashed the standby signal to the tug below him and, with a practiced motion, touched the controls to retract the tower. It slid smoothly into the sub, its plasteel lid twisting into the grooved seats.

A chest microphone hung beside the tower console. Sparrow slipped it on, spoke into it: "Rig for dive."

He focused his attention on the dive board in front of him.

Back came Bonnett's voice, robbed of life by the metallic mutes of the intercom: "Pressure in the hull."

One by one, the lights on Sparrow's dive board shifted from red to green. "Green board," he said. "Standby." Now he could feel the hull pressure in his ears and another kind of pressure in his stomach. He closed the signal circuit which told the outside crews that the subtug was ready to go down tunnel.

The *Ram* shifted, lurched. A dull clang resonated through the ship. Across the top of the dive board amber lights flashed: they were in the grip of the tunnel elevator. Twenty hours of free ride.

Sparrow grasped a handhold beside the dive board, swung down and out onto the engine room catwalk. His feet made a slithering sound on the catwalk padding as he made his

way aft, crawled through the control room door, dogged it behind him. His gaze paused for a moment on the hand-etched brass plate Heppner had attached beside the door—a quotation from some Nineteenth Century pundit:

"No one but a crazy man would waste his time inventing a submarine and no one but a lunatic would go down in it if it were invented."

Through the gulf shelf in the Florida elbow, DeSoto Canyon slashes the soft peninsula limestone like a railroad cut: fourteen fathoms where it starts in Apalachee Bay, more than two hundred and sixty fathoms where it dives off into the ocean deeps south of Cape San Blas and east of Tampa.

The gulf exit of the marine tunnel opens into the canyon wall at fifty fathoms: a twilight world of waving fan kelp, red fingers of gorgonian coral, flashing sparkles of reef-dwelling fish.

The *Fenian Ram* coasted out of the dark hole of the tunnel like a sea monster emerging from its lair, turned scattering the fish, and slanted down to a resting place in the burnt-umber mud of the canyon bottom. A sonar pulse swept through the ship. Detectors in the triple hulls responded, registered on control gauges of the navigation deck.

Garcia's clipped accent—oddly squeaking in the oxygen-high atmosphere—repeated the check list as he watched the *Christmas tree* lights of the main board. ". . . no leaks, trim weights balanced, external salvage air clear and pressure holding, atmosphere free of nitrogen, TV eyes clear and seeing, TV periscope surfaced and seeing; periscope gyro checks with—" His laughter echoed through the intercom: "Seagull! It tried to land on the peri-box as I started to reel in. Lit on its fanny in the water."

Bonnett's crisp tones interrupted: "What's it like topside, Joe?"

"Clear. Just daybreak. Going to be a good day for fishing."

Sparrow's voice rasped over the speakers: "Enough of that! Was there anyone up there to spot that gull's flop? They could've seen our box."

"Negative, skipper."

Sparrow said, "Les, give me the complete atmosphere check. Vampire gauges everyone. Follow the check. Report any deviations."

The patient inspection continued.

Ramsey interrupted. "I'm in the induction drive chamber. A lot of static here as I entered."

Garcia said, "Did you go back by the lower or shaft tunnel?"

"Lower."

"I noticed that myself earlier. We will rig a ground for the scuff mat. I think that'll fix it."

"I grounded myself before entering."

Sparrow said, "Run that down, Joe. Les, where are you?"

"Second level catwalk in the engine room."

"Relieve Joe on the main board. Ramsey, get into your shack. Contact with base in eleven minutes."

"Aye, skipper."

Sparrow moved from his position

on the control deck below Garcia to a point at the first level door which was open to permit visual inspection of the big gauges forward on the radiation wall. *That room in the bow,* he thought. *That's what worries me. We can see into it with our TV eyes; gauges tell us what's happening. But we can't touch it with our hands. We don't have a real feeling for that place.*

He mopped his forehead with a large red handkerchief. *Something, somewhere is wrong.* He was a sub-tug skipper who had learned to depend on his feeling for the ship.

A string of Spanish curses in Garcia's voice, rendered metallic by the intercom, interrupted his reverie.

Sparrow barked: "Joe! What's wrong?" He turned toward the stern, as though to peer through the bulkheads.

"Wiper rag in the rotor system. It was rubbing the induction ring every revolution. That's Ramsey's static."

"Does it look deliberate?"

"Did you ever come across a *silk* wiping rag?" The sound of a grunt came over the intercom. "There, by heaven!"

Sparrow said, "Save that rag." Then, "Ramsey, where are you?"

"In the shack warming up the transmitter."

"Did you hear Joe?"

"Yes."

"Tell base about that rag. Tell them—"

"Skipper!" It was Garcia's voice. "There's oil in the atmosphere back here!"

Sparrow said, "A mist of oil plus static spark equals an explosion! Where's that oil coming from?"

"Just a minute." A clanking of metal against metal. "Open petcock in the lube system. Just a crack. Enough to squirt a fine spray under full drive."

Sparrow said, "Ramsey, include that in the report to base."

"Aye, skipper."

"Joe, I'm coming back there," said Sparrow. "We're going over that drive room with a microscope."

"I've already started."

Bonnett said, "Skipper, would you send Ramsey up here after he gets off the contact? I'll need help checking the main board."

"Hear that, Ramsey?" asked Sparrow.

"Aye."

"Comply."

"Will do."

Sparrow went aft, dropped down to the lower level, crawled through the shaft tunnel and into the drive room—a cone-shaped space dominated by the gleaming brass induction ring, the spaced coils. He could smell the oil, a heavy odor. Garcia was leaning into the coil space, examining the induction ring by magnifying glass.

"They're just little things," said Sparrow. "But taken together: Boom!"

Garcia turned, his eyes glittering in the harsh work lights. "I don't like the feel of things, skipper. This is a

bad beginning. This is starting like a *dead-man* mission."

Sparrow took a deep breath, exhaled slowly. With an abrupt motion, he thumbed the button of his chest mike. "Ramsey, when you contact base, request permission to return."

"Aye, skipper."

Ramsey's thought leaped. *What will that do to morale? The first raider in months turns back without getting out of the Gulf. Bad.* He stared at the wavering fingers of the dial needles. His contact timer hit the red line, buzzed. He rapped out the first pulse with its modulated message: "Able John to Red Hat. Over."

The speaker above his head hissed with background noise like a distant surf. Presently, a voice came out of it, overriding the noise: "This is Red Hat. Over."

"Able John to Red Hat: We've discovered sabotage aboard. A silk rag was put in the rotor system of our drive. A lube system petcock was set to spray oil into the drive room. A static spark from the rag could've blown us out of the bay. Over."

"Red Hat to Able John. Stand by, please. We are routing your message to Bird George."

Security!

Again his speaker came to life: "Bird George to Able John. This is Teacher. What is the situation? Over."

Clint Reed! Ramsey could almost see the humorless face of his Security teacher. *Teacher Reed. Impromptu code.* Ramsey bent over his mike: "Teacher, this is Student." He repeated the story of sabotage.

"Teacher to Student. What's your suggestion? Over."

"Student to Teacher. Permit us to go on with the inspection out here. There's less chance for an unknown factor. Just the four of us aboard. If we check safe, allow us to continue the mission. Bad for morale if we came back. Over."

"Teacher to Student. That's the way we see it. But stand by." Pause. "Permission granted. How much time do you need? Over."

Ramsey turned on his intercom microphone. "Skipper, base suggests we continue the inspection here and not return if we check secure."

"Did you tell them what we'd found?"

"Yes, sir."

"What'd they say?"

"That there's less chance for a security slip out here. Fewer personnel. They suggest we double-check each other. And they want to know how much time we'll need."

Silence.

"Skipper, they—"

"I heard you. Tell them we'll need ten hours."

Ramsey turned back to his transmitter. "Student to Teacher. Skipper says give us ten hours. Over."

"Teacher to Student. Continue as ordered. We'll clear new check points for you. Over and out."

"Over and out."

Ramsey sat back, thought, *"Now, I've really stuck my neck out. But Obe said this one has to go through.*

Bonnett's voice rasped over the intercom: "Ramsey! If that contact's over, get up here and help me on this board!"

"Coming."

In the drive room, Sparrow hefted a socket wrench, looked at Garcia crouched under the secondary coils. "They want this one to go through, Joe. Very badly."

Garcia put a contact light on two leads. It glowed. "Yes, and they give us a green hand like that Ramsey. A near-dryback."

"His service record says limited combat in Gulf security patrols."

Garcia shifted to a new position. "Something odd about that chap."

Sparrow opened the plate over a condenser. "How so?"

"He strikes me like a ringer, a chap who pretends to be one thing when he's actually something else."

"Where do you get that idea?"

"I really couldn't say, skipper."

Sparrow shrugged, went on with his work. "I dunno, Joe. We'll go into it later. Hand me that eight-inch flex wrench, please."

Garcia reached up with the wrench, turned back to his own work. Silence came over the little room, broken only by the sound of metal on metal, buzzing of test circuits.

Sparrow ducked through the door into the control room, stood silently as Bonnett and Ramsey re-installed the final cover plate of the main board.

Bonnett straightened, rubbed the back of his neck. His hand left a grease smear there. He spoke to Ramsey: "You're a good boy, Junior. We may make a submariner out of you yet. You've just gotta remember that down here you never make the same mistake once."

Ramsey racked a screw driver in his tool kit, closed the kit, turned, saw Sparrow. "All secure, skipper?"

Sparrow didn't answer at once. He looked around the control room, sniffed the air. Faint smell of ozone. A distant humming of standby machinery. The round eyes of the indicator dials like symbiotic extensions of himself. The plucking disquiet remained within him.

"As secure as mortals can make it —I hope," he said. "We'll repair to the wardroom." Sparrow turned, ducked out the way he had entered.

Ramsey put his tool kit into its wall rack. Metal grated against metal. He shivered, turned. Bonnett was going through the door. Ramsey stepped across the control room, ducked through the door, followed Bonnett into the wardroom. Sparrow and Garcia already were there, Garcia seated to the right, Sparrow standing at the opposite end of the table. Ramsey's eyes widened. An open bible lay on the table before Sparrow.

"We invoke the help of the Al-mighty upon our mean endeavors," said Sparrow.

Bonnett slipped into a chair at the left.

Sparrow indicated the seat opposite himself. "Will you be seated, please, Mr. Ramsey?"

Ramsey lowered himself into the

chair, rested one hand on the green felt of the table cover. Sparrow towered above them at the other end of the table. *The Giver of the Law with hand upon the Book.*

Religious services, thought Ramsey. *Here's one of the binding forces of this crew. Participatión Mystique! The consecration of the warriors before the foray.*

"What is your religion, Mr. Ramsey?" asked Sparrow.

Ramsey cleared his throat. "Protestant Episcopal."

"It's not really important down here," said Sparrow. "I was merely curious. We have a saying in the subtugs that the Lord won't permit a *live* atheist to dive below a thousand feet."

Ramsey smiled.

Sparrow bent over the bible. His voice was steady as he read: "Woe unto them that call evil good, and good evil; that put darkness for light, and light for darkness; that put bitter for sweet and sweet for bitter! Woe unto them that are wise in their own eyes and prudent in their own sight!"

He closed the bible, holding his place with a finger, lifted his head. It was a movement of power, of authority. Ramsey received an impression of deep strength.

"We do our job with what we have at hand," said Sparrow. "We do what we believe to be the *right* thing. Though it grieve us, we do it. We do it that the Godless shall perish from the earth. Amen."

Sparrow turned away, placed the bible in a case against the bulkhead. With his back still turned to them, he said, "Stations, everyone. Mr. Ramsey, contact base, tell them we are ready to go. Get the time for the first check point."

Ramsey got to his feet. Foremost in his thoughts was the almost physical need to examine the first telemeter record on Sparrow. "Yes, sir," he said. He turned, ducked through the door to the companionway and across into his shack, contacted base.

First check point in four hours.

Ramsey relayed the information to Sparrow.

"Zero the automatic timelog," said Sparrow. "Check in, everyone."

"Garcia here. Drive and tow secure."

"Bonnett here. Main board secure."

Ramsey looked at his board in the electronics shack. A queer sensation of belonging here passed over him. A sense of familiarity, of association deeper and longer than the five weeks of training. "E-board secure," he said. "Two atmospheres in the hull." He looked to the vampire gauge on his wrist. "Diffusion normal-plus. No nitrogen."

Back came Sparrow's voice over the intercom: "Les, slide off."

Ramsey felt the subtug lurch, then a faint whispering pulse of power. The deck assumed a slight upward incline, leveled. Presently, it tipped down.

We're headed into the deeps, thought Ramsey. *Physically and mentally. From here on it's up to me.*

"Mr. Ramsey, come to the control deck," Sparrow ordered.

Ramsey closed down his board, went forward. Sparrow stood, hands behind his back, feet braced slightly apart, almost precisely in the center of the control deck. He appeared framed in a background maze of pipes, wheels, levers and dials. To his right, Garcia worked the tow controls; to his left, Bonnett held the high-speed pilot wheel. The big static pressure gauge high on the control bulkhead registered 1,310 pounds, increasing: they were below 3,000 feet.

Without turning, Sparrow asked, "What's in that little box that came aboard with your effects, Mr. Ramsey?"

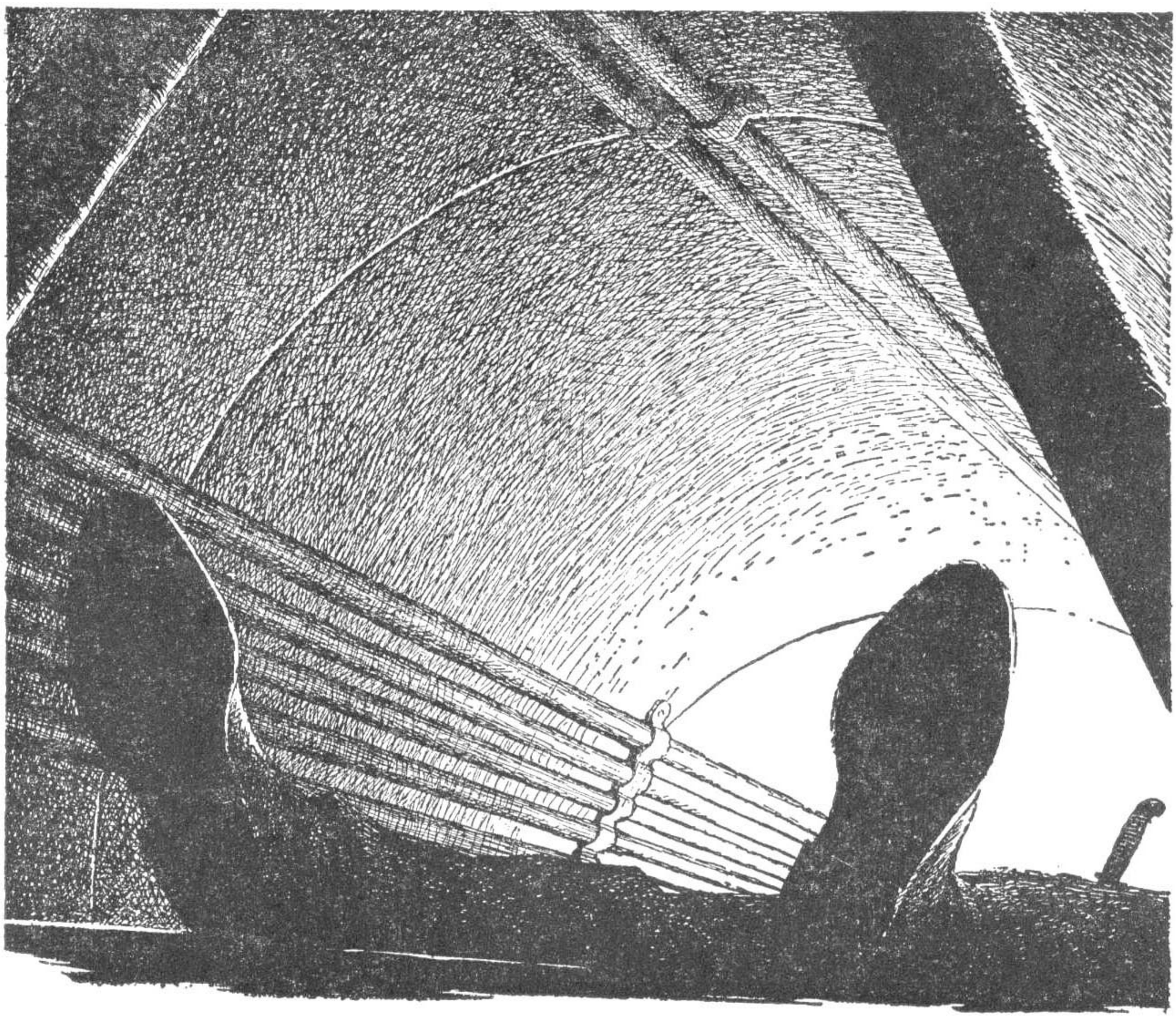
"Monitoring equipment for the new search system, sir."

Sparrow's head moved to follow the flickering of a tow control dial; he turned back. "Why was it locked?"

"It's extremely delicate and packed accordingly. They were afraid someone—"

"I'll want to see it at the first opportunity," said Sparrow. He stepped over behind Bonnett. "Les, is that a leak in compartment nine?"

"There's no moisture or pressure



variant, skipper. It has to be condensation."

"Keep an eye on it." Sparrow stepped back beside Ramsey.

I'm going to find out quick if that disguise system in the box satisfies his curiosity, thought Ramsey.

"What's your hobby?" asked Sparrow.

Ramsey blinked. "Astronomy."

Bonnett spoke over his shoulder: "That's a peculiar hobby for a submariner."

Before Ramsey could reply, Sparrow said, "There's nothing wrong with astronomy for a man who goes to sea."

"The basis of navigation," said Ramsey.

Sparrow glanced sidelong at Ramsey, returned his gaze to the board. "I was thinking as we moved out across the mooring basin back at base that we were entitled to a last look at the stars before going under the sea. They give one a sense of orientation. One night before we left Garden Glenn I was struck by the clarity of the sky. The constellation of Hercules was—" He broke off as the *Ram's* nose tipped upward.

"A down current caught the tow," said Garcia.

Bonnett's hands moved over his controls to correct for the deflection.

"Hercules," said Ramsey. "Do you mean the Kneeler?"

"Not many call him that any more," said Sparrow. "I like to think of him up there all these centuries, guiding mariners. The Phoenicians used to worship him, you know."

Ramsey felt a sudden wave of personal liking for Sparrow. He fought it down. *I must remain clear-headed and objective,* he told himself.

Sparrow moved to the left to get a clearer view of the pilot gauges. He studied them a moment, turned to Ramsey. "Has it ever occurred to you, Mr. Ramsey, that these Hell Diver subtugs are the closest things to spaceships that mankind has developed? We're completely self-contained." He turned back to the control board. "And what do we do with our spaceships? We use them to hide under the liquid curtain of our planet. We use them to kill one another."

Ramsey thought: *Here's a problem—a morbid imagination vocalized for the benefit of the crew.* He said, "We use them in self-defense."

"Mankind has no defense from himself," said Sparrow.

Ramsey started to speak, stopped, thought: *That's a Jungian concept. No man is proof against himself.* He looked at Sparrow with a new respect.

"Our underground base," said Sparrow. "It's like a womb. And the marine tunnel. A birth canal if I ever saw one."

Ramsey thrust his hands into his pockets, clenched his fists. *What is going on here?* he asked himself. *An idea like that should have originated with BuPsych. This man Sparrow is either teetering on the edge or else he's the sanest man I've ever met. He's absolutely right about that base and the tunnel and we've never spot-*

ted it. Why? This bears on our problem. But how?

Sparrow said, "Joe, secure the tow board on automatic. I want you to go with Mr. Ramsey now and test out the new detection gear. It should be ranged on our first checkpoint." He looked to the big sonoran auto-nav chart on the forward bulkhead and the red dot showing their DR position. "Les, surface the peri-box and get a position reading."

"Right, skipper."

Garcia closed the final switch on his board, turned to Ramsey. "Let's go, Junior."

Ramsey looked at Sparrow, a wish to be part of this crew uppermost in his mind. He said, "My friends call me Johnny."

Sparrow spoke to Garcia. "Joe, would you also initiate Mr. Ramsey into the idiosyncracies of our atmospheric system. The carbonic anhydrase phase regulator would be a good place to start."

Ramsey felt the rejection of his first name like a slap, stiffened, ducked through the aft door and into the companionway.

Garcia followed, dogged the door behind them, turned, said, "You'd better know something about the subtugs, Ramsey. A new hand is always known by his last name or anything else the crew feels like calling him until after the first combat. Some guys hope they *never* get called by their first name."

Ramsey cursed inwardly. Security had missed that point. It made him appear like a green hand. Then he thought: *But this a natural thing. A unit compulsive action by the crew. A bit of magic: Don't use the secret name of the new man lest the gods destroy him—and his companions.*

In the control room, Bonnett turned to Sparrow, sniffed. He rubbed a hand across the back of his neck, turned back to the control board. "He's green," he said.

"He appears willing, though," said Sparrow. "We can hope for the best."

Bonnett asked, "Aren't you worried about that last minute Security checkup on the guy?"

"Somewhat," said Sparrow.

"I can't 'help it," said Bonnett. "The guy—something about him. . . . I dunno. He strikes me as a wrongo." Bonnett's shaggy brows drew down in thought.

"It could've been routine," said Sparrow. "You know the going over they gave us."

"I'm still going to keep an eye on him," said Bonnett.

"I've some paper work," said Sparrow. "Steady as she goes. Call me before the first check point."

"What's the watch schedule?" asked Bonnett.

"That's what I'm going to be working on," said Sparrow. "I want to set it up so I can spend some time with Ramsey while we're still in comparatively safe waters. I don't want him goofing when the chips are down."

Sparrow ducked for the aft door, went down the companionway and

into the wardroom. The first thing that struck him as he entered was the color of the wardroom table cover—a cover and a color he had seen thousands of times.

Why is it that Navy wardrooms always have green table covers? he asked himself. *Is it a little of the color of the growing land? Is it to remind us of home?*

In the electronics shack, Garcia and Ramsey closed down the board after testing the detection gear.

"What now?" asked Ramsey.

"You'd better log a little sack time," said Garcia. "It's Les's watch. The skipper's probably setting up the schedule right now. You may be called next. Things are pretty loose the first day or so."

Ramsey nodded, said, "I am tired." He turned aft, said, "See you later."

Garcia's "Righto" floated after him.

Ramsey hurried down to his room, dogged the door, dragged out the telemeter box, unlocked it, extracted the first record strips, sat back to examine them.

Pituitrin and adrenaline high points showed early on the scrolls. Ramsey noted that one was before he arrived and the other coincided with the moment pressure was first bled into the hull.

The first tense moments, he thought. *But that's normal.*

He reeled the scrolls of telemeter tape forward to the moment the sabotage was discovered, double checked the time setting, scanned backward and forward across the area.

Nothing!

But that can't be!

Ramsey stared at the pattern of rivets on the bulkhead opposite him. The faint whispering of the drive seemed to grow louder. His hand on the blanket beside him felt every tuft, every thread. His nostrils sorted out the odors of the room: paint, oil, soap, ozone, perspiration, plastic—

Is it possible for a person to go through anxiety without glandular changes? he asked himself. *Yes, under certain pathological circumstances, none of which fit Sparrow.*

Ramsey remembered the sound of the captain's voice over the intercom during the period of stress: higher pitched, tense, clipped.

Again, Ramsey examined the tape. *Could the telemeter be wrong?* He checked it. Functioning perfectly. Could there be disfunction in the mechanism within Sparrow's flesh? Then the other fluctuations would not have registered.

Ramsey leaned back, put a hand behind his head, thought through the problem. Two major possibilities suggested themselves: *If Sparrow knew about the wiper rag-oil spray thing, then he wouldn't be anxious. What if he planted the rag and set that lube system petcock himself? He could've done it to disable the ship and stop the mission because he's lost his nerve or because he's a spy.*

But there would've been other psychomotor indications which the telemeter would have registered.

This led to the other possibility:

In moments of great stress Sparrow's autonomic glandular functions are taken over by the higher cortical centers. That could tie in with the known paranoic tendencies. There could be a systematic breakdown of normal function under stress: such a turning away from fear that the whole being believes there could be no danger.

Ramsey sat bolt upright. That *would fit the pattern of Sparrow's religious attitude. An utter and complete faith would explain it. There had been religious-paranoics before. They'd even tried to hang the label on Christ.* Ramsey frowned. *But of course Schweitzer made the ones who tried look like fools. Tore their arguments to shreds.*

A sharp rap on Ramsey's door interrupted his thoughts. He slipped the tapes into the false bottom of the telemeter box, closed the lid, locked it.

Again the rap. "Ramsey?" Garcia's voice.

"Yes?"

"Ramsey, you'd better take a couple of anti-fatigue pills. You're scheduled for the next watch."

"Right. Thanks." Ramsey slipped the box under his desk, went to the door, opened it. The companionway was empty. He looked at Garcia's door across the companionway, stood there a moment, feeling the ship around him. A drop of moisture condensing from the overhead fell past his eyes. Abruptly, he had to fight off a sense of depression. He could almost feel the terrible pressure of water around him.

Do I know what it is to be truly afraid? he asked himself.

The *Ram* moved to the slow rhythm of the undersea currents, hiding under every cold layer her crew could find because the cold water damped the sound of her screw, creeping between the walls of underwater canyons like a great blimp with a tail because the canyon walls stopped the sound of her passage.

Watches changed, meals were eaten. A chess game started between Sparrow and Garcia. The automatic timelog's hands swept around, around, around and around, clocking off the deadly dull routine of danger. The red dot marking their position on the sonoran chart crept around the tip of Florida, up the Atlantic Coast and out into the ocean—a mite creeping toward Iceland.

Five days, thirteen hours, twenty-one minutes from point of departure.

Sparrow entered the control room, stooping for the door, pausing inside to sweep his gaze over the dials—his *other* sense organs. Too much moisture in the atmosphere. He made a mental note to have Garcia check that on his watch. Now, it was Bonnett's watch. The main board was set up for remote control. A repeater board was missing from its rack.

On the sonoran chart, their position marker stood almost due east of the northern tip of Newfoundland, and on a line south from the southernmost tip of Greenland: course sixty-one degrees twenty minutes. The static pressure gauge registered 2360

pounds to the square inch: about 5500 feet below the surface.

Sparrow stepped across the control room, ducked through the door and out onto the engine room catwalk. The catwalk padding felt soft under his feet.

Bonnett stood on the lower catwalk, back to Sparrow, staring down to the left. Sparrow followed the direction of his first officer's gaze: The door sealing one of the emergency tunnels into the reactor room.

Something odd about Bonnett's movements, thought Sparrow. *Looks like he's counting.*

Then Sparrow recognized the motion: Bonnett was sniffing the air. Sparrow took an experimental whiff himself, smelled the omnipresent stink of their recirculated air plus the ozone and oil normal to the engine room. He strode out onto the catwalk, bent over the railing. "Something wrong, Les?"

Bonnett turned, looked upward. "Hi, skipper. Don't know. I keep smelling something rotten in here."

Sparrow's lips twisted into a half smile. "How can you tell in this stinkpot?"

"I mean actually rotten," said Bonnett. "Carrion. Rotting meat. I've been getting it for several days—every time I go past here."

"Has anybody else noticed it?"

"They haven't said."

"It's probably your imagination, Les. After five days in this floating sewer pipe everything stinks."

"I dunno, skipper. I can sort out most of the smells. This one doesn't fit."

"Just a minute." Sparrow stepped to the connecting ladder, dropped down to Bonnett's level.

"Take a sniff, skipper."

Sparrow drew in a deep breath through his nose. There *was* a faint carrion odor in the air. But meat went bad quickly in the heavy oxygen of a subtug's atmosphere. "Could it be a dead rat?" he asked.

"How would it get aboard? Besides, we went over the *Ram* with a fine-tooth comb. A mosquito could not—" He broke off, turned, stared at the radiation bulkhead.

"There's one place we didn't comb," said Sparrow.

"Still, we looked it over with the internal eyes," said Bonnett. "There—" He fell silent.

"Let's take another look," said Sparrow.

He led the way back to the control room, keyed the master screen to the reactor room scanners, one by one.

"Nothing," said Bonnett. He looked at Sparrow, shrugged.

Sparrow glanced at his wrist watch. "Joe went off duty about an hour ago." He looked at the now-blank screen. "Get him up to that tunnel door anyway. Put Ramsey on standby here in the control room. I'm going forward." He stooped for the forward door, went out onto the catwalk, dropped down to the lower level.

In the control room, Bonnett went to the communications panel, buzzed

Garcia. A sleepy voice came on the speaker. "Yeah?"

"Skipper wants you forward. Number one reactor room tunnel."

"What's up?"

"He'll tell you."

Bonnett closed the circuit, opened the call network. "Ramsey."

"Aye. In the Rec room."

"Standby on the control deck."

"Right away."

Bonnett clicked the call switch to off, joined Sparrow at the tunnel door forward. Garcia was with them almost immediately, still buttoning his shirt, black hair tumbled over his forehead. "Something wrong?"

Sparrow said, "You made the last pile check, Joe. Did you open the tunnel doors?"

"Sure. But I didn't go inside. The Security crew gave us a clean—"

"That's O.K. Did you smell anything?"

Garcia frowned. "You mean like with my nose?"

"That's right."

"I don't believe so." Garcia scratched his head. "Why?"

"Take a sniff," said Bonnett.

Garcia wrinkled his nose, inhaled. Again. "Rotten."

"Les has been smelling it for a couple of days."

"Has anybody checked the ventilator duct?" asked Garcia.

"First thing," said Bonnett. "I couldn't be certain. Far enough in there it'd be a race between bacteria and sterilizing radiation."

"With the bacteria winning as soon as we hit high oxy," said Sparrow. He pointed to the screened outlet of the tunnel vent. "It's worse right there. Joe, get me a length of our spare high-pressure tubing."

"How long?"

"About twenty feet. Something that'll bend for the center dip of the tunnel and reach out into the open section."

"Righto." Garcia went aft and into machine stores.

Sparrow turned to a wall rack, broke out a portable TV eye and spotlight. "All of us have a blind spot on the reactor room. We don't like to think about it. We count on the stationary eyes being arranged for maximum inspection. This way we'll lose one portable eye and one spotlight when they get hot, but we'll see into the odd corners."

Garcia returned with the tubing. "What're you going to do?"

"Rig a portable eye and light on the end," said Sparrow.

Garcia blushed. "I didn't think of that."

"Like I was telling Les," said Sparrow. "Our minds don't function right on—"

Ramsey's voice came from the speaker on the bulkhead above them. "I have you on my screen here. What's doing?"

Bonnett thumbed his chest mike. "Something rotten in this pile room tunnel."

Sparrow looked up from where he was rigging the TV eye and light to the tubing. "Have him take it from the portable board you left up there

on the catwalk railing. We may need his help."

Bonnett relayed the order.

Presently, Ramsey came out on the catwalk above them, checked the portable control board. He leaned over the railing, looked down at them. "I just smelled it," he said. "Do you think it's a rat?"

"Don't know," said Bonnett.

"Here." Sparrow passed the tubing to Garcia, turned to the tunnel door, undogged it, paused. He looked up at Ramsey. "Take that board back a ways."

Ramsey complied, moving about ten feet back along the catwalk.

Sparrow nodded to Bonnett. "Les, move over a bit."

Bonnett stepped back out of line of the door. "What're you expecting?"

Sparrow nodded toward the fixed radiation counter above the tunnel door. "It may be a little warm. Keep an eye on that thing."

Garcia brought a portable radiation snooper from its wall rack, stood beside Sparrow.

"O.K.," said Sparrow. "Here goes." He pulled the door open.

Garcia gagged.

"Wheee-ew!" gasped Sparrow.

"If you'll excuse the pun," said Bonnett, "I don't like the smell of that."

Ramsey leaned over the railing. "That's no rat," he said. "Too much of it."

Sparrow took the length of tubing, snapped on the light. It was turned so that it's beam flashed full into Ramsey's eyes, blinding him momentarily. When Ramsey's vision returned, Sparrow had the tube pushed into the tunnel. Garcia was bent over the portable receiver beside the door, staring into the screen.

Ramsey tuned one of his own circuits to the portable unit, gasped as Garcia barked, "Skipper! Look at this!"

The screen showed part of the downward curve of the tunnel floor. Just within view were the soles of a man's shoes and part of his legs. The picture stopped just below the knees.

Bonnett looked up at Ramsey, who caught a glimpse of staring eyes under the shaggy brows. Sweat glistened on the first officer's forehead. "You getting this on your screen?" he asked.

Ramsey nodded. Because of the angle of view, the men below him had a foreshortened, gnomelike appearance. A trick of acoustics brought their voices to Ramsey with a faint ringing quality. He felt like a man observing a marionette show.

Bonnett turned back to examine the fixed meter above the door. "Radiation's up slightly," he said.

"Nothing the filters can't take care of," said Garcia.

Sparrow was bending over to maneuver the TV eye and light farther into the tunnel. Garcia moved the portable receiver back where Bonnett could see it.

"Anything?" asked Sparrow.

"More leg," said Bonnett.

Ramsey became conscious of a low

murmuring, realized that Garcia was whispering: "Holy Mary, mother of God—" The engineering officer's hands were tolling his Rosary.

Sparrow gave the rod a gentle twist.

"Knife!" blurted Bonnett.

Ramsey saw it on his panel. The hilt of a knife projected from the chest of the man in the tunnel.

"Get a record camera on this," ordered Sparrow.

"I have it up here," called Ramsey. He pulled the camera from its rack beside the control board, hung it over the receiver screen.

Sparrow pushed the tubing farther into the tunnel until the scanner picked up the man's face. "Anybody recognize him?"

"I think I've seen him," said Garcia. "That's a rating uniform. Looks like atomic tech insignia." He shook his head. "But he's not one of the techs I let aboard for the final embarkation check."

Sparrow turned, looked up at Ramsey. "How about you, Ramsey?"

"He's a special security officer attached to Admiral Belland's office," said Ramsey. "His name's Foss or Foster. Something like that."

"How do you know?" asked Bonnett.

Ramsey suddenly realized he had committed a tactical error. "When I was with the Gulf patrol," he answered, "this bird was our Security liaison."

The lie came easily. He remembered the last time he had seen the man: Belland's outer office, Teacher Reed performing the introductions.

"Do you know what he was doing here?" asked Sparrow.

Ramsey shook his head. "I can guess. He was probably making a special check when somebody caught him."

"Caught him at what?" asked Garcia.

With an abrupt intake of breath, Ramsey recalled that Garcia was the suspected sleeper.

"It was probably the other way around," said Bonnett. "This Security officer caught somebody doing something and—"

"Doing what?" barked Sparrow. He turned to a locker to the left of the tunnel. "Joe, help me into an ABG suit." He opened the locker, pulled out a suit.

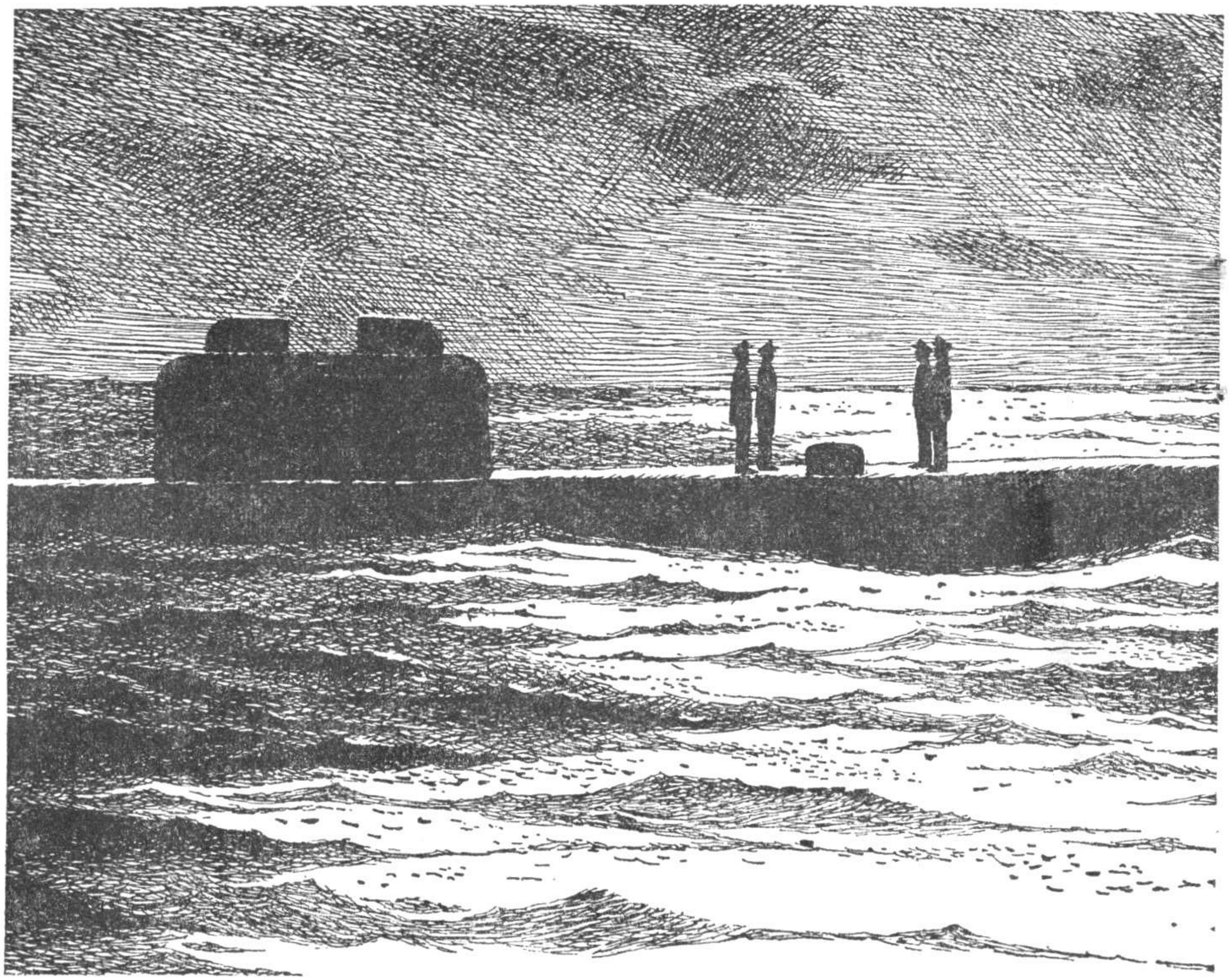
Garcia moved to help him into the bulky suit.

Presently, Sparrow's voice came to them over the suit communicator: "Les, get a contamination bag and a lead box for this man's effects. Leave it at the hatch here. Joe, get into another suit to help me when I bring him out. Ramsey, monitor me and get a still record of the items I hold up for you. Get a repeater on my suit's radiation snooper. I may be too busy to watch it."

"Right," said Ramsey.

Garcia already was pulling on another suit. Bonnett was moving aft toward the door into the machine stores.

Sparrow ducked for the tunnel door, clambered clumsily into the



tunnel. Immediately, the radiation snooper repeater on Ramsey's board picked up the count.

"It's hot in there," said Ramsey. "I read it 5000 milli-R here."

"I see it," said Sparrow. "Tune to my helmet scanner."

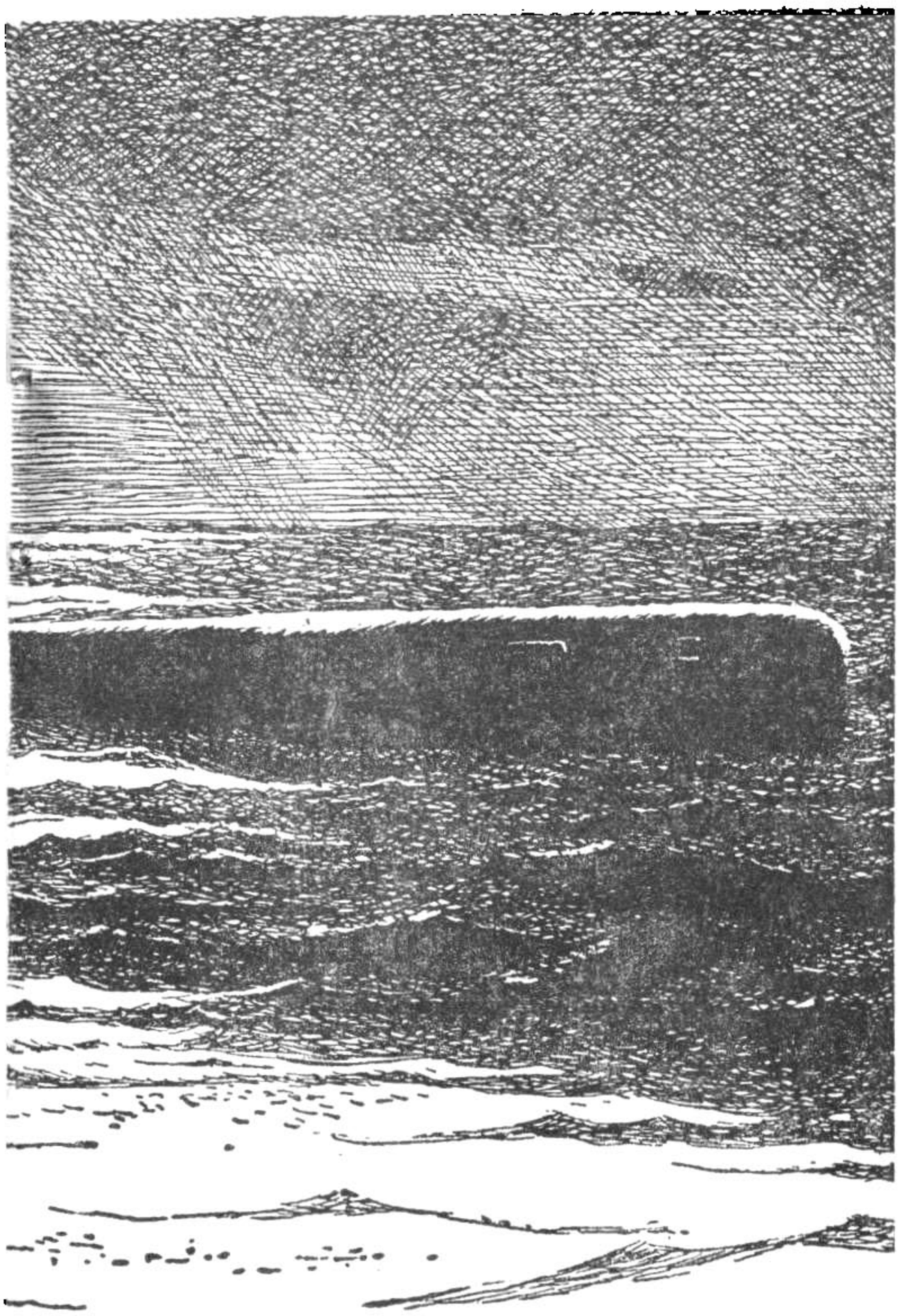
Ramsey tuned another screen on his board to the scanner on Sparrow's helmet. The screen showed a gloved hand: Sparrow's. The hand moved out of range and revealed a portion of the dead man's uniform.

"Note," said Sparrow. "He left a note. Get a voice record of this as I read it and then photograph it. It's dated April 16th, time oh-eight-forty-five."

Our embarkation day, thought Ramsey. *At that time we were in the marine tunnel.*

Sparrow's voice continued: "To Captain H. A. Sparrow from Lt. Arthur H. Foss, SYO-2204829. Subject: Extra Security inspection subtug *Fenian Ram* this date."

The captain cleared his throat, continued: "Pursuant to new Security policy, I was making a special investigation of your atomic components following the regular check by the pile crew. This was to be a quick tun-



nel-crawl for a look at the end plate and manuals. I did not wear an ABG suit because of the anticipated short time of the check and to maintain secrecy."

Garcia had moved up to the tunnel mouth, hovering over it in his ABG suit like some other-world monster. "You want me in there, skipper?" he asked.

"Wait out there, Joe," said Sparrow. He went on reading: "My snooper's switch was accidentally turned off as I crawled through the tunnel and I received no warning that it was hot. (Sparrow's voice quickened.) I found that one of your hafnium damper rods had been taken from the pile in the secondary bank and hidden in the tunnel. I was directly on top of it before I noticed it. There was no mistaking what it was. I turned on my snooper and immediately saw that I'd had a lethal overdose."

Sparrow paused. "May the Lord be merciful to him," he said. He continued with the note: "It was obvious that the damper rod had been selected for a timed overload, but the timing was not immediately apparent. It could have been set to blow at the base. Therefore, I made haste to slip the rod back onto the pile room manuals and replaced it. I also repaired the alarm system wiring where it had been cut to hide the sabotage."

Sparrow stopped and Ramsey saw the note—through the scanner—change position as the Skipper shifted. "Joe, did you notice any peculiar reaction from the alarm system?" asked Sparrow.

"Not a thing," said Garcia.

Sparrow grunted, continued with the note: "When the damper had been replaced, I looked for the communicator box at the pile end. It had been smashed. I then crawled back, thinking I'd get the medics to ease my dying. The tunnel hatch had been dogged from the outside and I was trapped. I tried to attract attention by calling through the vent, but there was no response. My own portable communicator would not work inside the shielding of the reactor wall."

Sparrow's voice stopped. "That explains it," he said.

Ramsey bent over his panel mike. "Explains what?"

"This tunnel vent opens from the inside. It should've been closed. But if it'd been closed we wouldn't have noticed—" He fell silent.

Ramsey's thought went to the actions of that Security officer: alone in the tunnel with the certain knowledge he was dying and nothing could save him. Spending his last minutes to guard the safety of others.

Would I have been as brave? he wondered.

Sparrow said, "He put the knife in himself rather than go out the slow way alone in here. He says he doesn't know who sabotaged the pile and trapped him."

"He could've attracted somebody," said Ramsey. "If he'd shorted one of—"

"And he'd have chanced shorting the wrong circuit and kicking every damper rod out onto the pile room floor," said Garcia.

"But the gravity catches—"

"How could he know what'd been fouled up in there?" demanded Garcia. His voice was choked with emotion. "But suicide!"

Sparrow said, "Joe, who were the last dock crewmen aboard?"

"Two snoopers I let aboard. I believe you saw them leave."

Ramsey thought: *Garcia again.* He leaned over the catwalk railing, called down to Garcia. "Joe, who were—" Then he remembered that Garcia's suit would damp out the sound and turned back to his mike. "Joe, who were those men?"

The blank faceplate of Garcia's suit tipped upward toward Ramsey. "Two new ones. Their names are on the gangway checklist."

Sparrow said, "Record this from the note, Ramsey." He read: "Whoever sabotaged your pile was hoping it would blow while this subtug was in the marine tunnel. Such a blowup would eliminate the subtug base until a re-routed tunnel section could be built. Obviously, the enemy knows of the existence of this base. Security should be notified at once." The skipper's voice lowered. "Please tell my wife that my last thoughts were of her."

Garcia said, "Those dirty, evil—" He choked.

Sparrow held up the note for his suit scanner while Ramsey photographed it.

"Is there anything else?" asked Ramsey.

"A notebook filled with what looks like Security code. Yes, here's a notation from Lieutenant Foss: 'See that Security Section Twenty-Two gets this notebook.' "

Ramsey saw the book through Sparrow's suit scanner.

Sparrow said, "Record the pages as I hold them up, Ramsey." He flipped through the pages for the scanner, said, "I have the contents of his pockets. I'm coming out." He backed out to the tunnel entrance.

Bonnett returned from the rear

storeroom dragging a bulky contamination bag and a small lead box. He looked up at Ramsey, said, "I listened in on the storeroom portable while I was getting this stuff. How I'd like to have my hands on the rats who scragged that poor guy!"

"You mean who almost scragged us," said Ramsey. He bent over his panel mike: "Joe, you'd better get that stuff from Les. He shouldn't go any closer to the tunnel without a suit."

Garcia's voice issued from the speaker: "Righto." He went back to the engine room floor to Bonnett, returned to the tunnel with the contamination bag and lead box.

Sparrow emerged from the tunnel, turned, said, "Ramsey, record these items as I put them in the box. One Mark XXVII hand-snooper, one wrist-type communicator, one flashlight, one wallet with the following items: one picture of woman and child inscribed 'All our love, Nan and Peggy,' one ID card issued to Lt. Senior Grade Arthur Harmon Foss SYO-2204829, one base gate pass, one mess hall pass, one driver's license, currency and coins to sixteen dollars and twenty-four cents."

He turned back to the tunnel, picked up another bundle tied in a handkerchief, untied the handkerchief clumsily with his heavily-gloved hands. "Here's some more: one fountain pen, one key ring with four keys, one fingernail clipper, one minicamera. The telltale's turned red: film's been ruined by radiation. One pocket recorder with wire blank."

Sparrow dropped the bundle into the lead box. Garcia sealed it.

Ramsey glanced at his wrist watch, noted the time. The telemeter record of Sparrow's reactions: What would be shown for this period? he asked himself.

Garcia straightened from the lead box. "What's the pile-end like?" he asked.

Sparrow nodded his head toward the tunnel mouth, a grotesque gesture in the bulky suit. "Just as he described it. Everything back as it should be. All except the communicator box. Smashed. Why?"

"Maybe whoever did it anticipated the inspection," said Garcia.

"Maybe."

Ramsey's hands moved over his portable control panel, compensating for a minor course deflection caused by an upward current. When they were back on true, he looked over the railing. Garcia and Sparrow were just sealing the Security officer's body into the contamination bag.

Sparrow said, "Les, when we get him out of here, flush this area out with the detergent hoses. Let me know what the radiation count is."

Ramsey punched the switch on his panel mike: "Skipper, that note could've been faked to throw us off. Did you think of that? It strikes me the man would've used his recorder."

Garcia said, "And taken the chance of having his message accidentally erased. No, sir." He dragged the sacked body under an engine room hoist.

Sparrow said, "Les, when you get

this place cleaned, get into a suit and make another inspection of the end plate and manuals of this tunnel. I'm eight minutes from my limit."

Bonnett acknowledged.

Garcia passed a snooper over the contamination bag. "Hot," he said. "We'll have to get him overboard within twelve hours. Otherwise, I wouldn't be responsible for the filters clearing our air." He racked the snooper, turned back, rigged a net under the bag.

Meanwhile, Bonnett had gone down the starboard side of the engine room, donned an ABG suit from that side and moved to the detergent hoses at the tunnel mouth.

Garcia took the slack out of the hoist line, turned toward Sparrow. "Skipper, why don't you get Les to help you here and let me crawl the tunnel? That's my department."

The faceplate on Sparrow's suit turned toward Bonnett, who had hesitated beside the tunnel door. "O.K., Joe. Les, give me a hand here."

Bonnett stepped to Sparrow's side.

Garcia went to the tunnel door, turned back and looked up at Ramsey. The quartz viewplate gave him the appearance of a one-eyed monster. He turned back to the tunnel, bending down as he snaked his way inside. Presently, his voice came over the speaker to Ramsey: "You with me, Junior?"

"I read you."

"My suit snooper says it's hotter than a two-dollar pistola where the shield curve ends here. I'm at the halfway mark. Here's the tunnel communicator box. It's a mess. (pause) I'm now at the manuals. (long pause) They're operating. End plate secure; seal restored. (long pause) The mirrors show no visible evidence of sabotage on this face of the pile. All secure. I'm coming out."

In Ramsey's mind a single thought: *If Garcia's really a sleeper, what's he actually doing in there? Why was he so anxious to make that inspection?*

Ramsey wondered if he could think up an excuse to make a personal inspection of that tunnel.

Probably not, he thought. *Sparrow wouldn't risk having three of his crewmen take a near limit dosage. He'd have no reserve if something else made it necessary to crawl one of the tunnels.*

Ramsey resolved to make as thorough an inspection as possible using the internal scanners.

Sparrow and Bonnett were hoisting the contamination bag up to the discharge tubes below the retracted conning tower. Sparrow said, "Ramsey, take your board back against the aft bulkhead. That bag's leaking some."

Ramsey complied, racking his board on the catwalk rail.

Sparrow left the hoist to Bonnett, stepped into the decontamination chamber against the port pressure hull, emerged without his ABG suit. He looked up to Ramsey, his long face drawn down into serious lines. "Is Joe on his way out?"

"He's on his way," said Ramsey.

"Foss' ID card shows he was a

Catholic," said Sparrow. "Ask Joe if he'll read the prayers for the dead."

Ramsey relayed the request.

Garcia, emerging from the tunnel, paused. "He couldn't have been a Catholic," he said. "Either that, or he was murdered. A good Catholic doesn't commit suicide, no matter how hopeless the situation is."

Sparrow heard Garcia's voice on the speaker, said, "He's right." He looked thoughtful for a moment, found his chest mike, asked, "Will you say the prayers?"

Garcia said, "Under the circumstances, yes." He closed the tunnel door, dogged it, stepped into a decontamination chamber and emerged without his suit.

Bonnett swung up to the central catwalk, anchored the hoist's load with a side line, returned to the lower deck and reeled out the detergent hoses. He began to spray the area.

Sparrow and Garcia mounted to the lower catwalk beside Ramsey.

"We'll surface at midnight local time for burial," said Sparrow. He went aft through the number one door without glancing up at the bundle swinging from the hoist.

Ramsey, watching Bonnett at work below him, again had the feeling of looking at a marionette show. *Last act, scene one.*

Garcia, beside him, said, "My watch coming up. I'll take it in the main control deck." He released Ramsey's portable board from the rail, carried it up to the central catwalk, ducked through the door in the aft bulkhead.

Ramsey followed, turned at the door for one last look at the long bundle swaying in the hoist net: A body in a sack. He turned, passed through the control room, went directly to his quarters and pulled out the telemeter tapes.

No significant deviations!

He coded the tapes for identification, placed them in the false bottom, lay back on his bunk. Around him he could feel the faint vibrations of the subtug: a feeling as of life. He seemed to fit into the pattern of the room, one with the crisscross of pipes overhead, the ventilator ducts, the repeaters for the electronics shack instruments, wall mike and speaker.

Presently, he fell asleep, dreamed that he was a deep-dwelling fish who was trying to figure out a way to climb to the light of the surface faraway above him. The problem was that a terrible pressure held him trapped in the deeps.

At midnight they committed the body of Lieutenant Arthur Foss to the ocean. A cold, starless night, a high-running sea. Ramsey stood shivering on the deck while Garcia said the prayers for the dead.

For Lieutenant Arthur Harmon Foss: last act, last scene.

Afterward, they homed into the depths as though fleeing the scene of a crime. Ramsey was startled by the faraway look in Sparrow's eyes, heard the captain whispering the lines from the first chapter of Genesis:

". . . And darkness was upon the face of the deep. And the Spirit of

God moved upon the face of the waters."

From some recess in his memory, Ramsey recalled the next lines: "And God said, 'Let there be light': and there was light."

Ramsey thought, *If there is a God, let Him make things right for that brave guy.* It was his nearest approach to a prayer since childhood. He was surprised at the stinging sensation in his eyes.

Then another thought mingled with the memory of Garcia's voice: *And what if Garcia is the sleeper?*

The thought spurred him to hurry into the electronics shack, examine the contaminated tunnel through the internal scanners. The scanners showed only the pile-room end. Nothing appeared amiss. Ramsey activated one of the control room scanners to check on Garcia. The engineering officer was bent over the portside grab rail, knuckles white from the pressure of his grip upon the rail, his forehead pressed against the cold metal of the tank hull.

He looks ill, thought Ramsey. *I wonder if I should go down and relieve him?*

As Ramsey watched, Garcia straightened, slammed a fist against the hull surface so hard his knuckles bled. The *Ram* took this moment to tip slightly from the thrust of an undersea current. Garcia whirled to the controls, corrected for the deflection. Ramsey could see tears streaming down his face.

Abruptly, Ramsey switched off his screen, feeling that he had eavesdropped upon the workings of a man's soul and that it was wrong to have done so. He stared at his hands, thought, *Now that's a strange reaction for a psychologist! What's come over me?* He re-activated the screen, but now Garcia was calmly going about the business of his watch.

Ramsey returned to his quarters with the strong sense that he had blinded himself to something vital. For almost an hour, he lay awake on his bunk, unable to resolve the problem. When he fell asleep it was to sink again into the dream of the fish.

He awoke to his next watch with the feeling of not having slept at all.

There had been a time when people thought it would solve most seafaring problems to take ocean shipping beneath the surface storms. But, as had happened so many times in the past, for every problem solved a new one was added.

Beneath the ocean surface flow great salt rivers, their currents not held to a horizontal plane by confining banks. The six hundred feet of plastic barge trailing behind the *Ram* twisted, dragged and skidded—caught by currents flowing through three hundred and sixty degrees at right angles to their course. If the current set downward, the *Ram* tipped upward and had to fight against the climb. If a current took the tow upward, the *Ram* headed down. Variations often gave the sub-tug's deck a stately rolling and tipping as though the vessel were beset by a slow-motion storm.

Automatics took care of most of the deflections, but many were sufficient to cause wide course error. Because of this, a portable gyro repeater always accompanied the man on duty.

Bonnett carried such a repeater on his remote-control panel as he prowled the engine room during his watch. The little timelog repeater beside the gyro-dial showed seven days, eight hours and eighteen minutes from departure. The *Ram* had moved forward, deep into the ocean no-man's land south of Iceland.

Maybe it'll be a milk run, he thought. *For all our detectors have shown, we could be alone in the whole ocean.* He fell to remembering the night before departure, wondered if Helene was really faithful to him.

An amber light glowed at the upper corner of his board, the signal that someone had entered the control room. He spoke into his chest mike: "I'm on the second level catwalk in the engine room."

Sparrow's voice came out of the board speaker: "Continue as you are. I'm just restless. Thought I'd look around."

"Right, skipper." Bonnett turned to examine the master control gauges on the reactor bulkhead. Ever since they'd found the dead Security officer, Bonnett had been nursing an uneasy feeling about the room in the sub-tug's nose.

A sudden needle deflection on his control board caught his attention. The outside water temperature had dropped ten degrees: a cold current.

Ramsey's voice came over the intercom: "This is Ramsey in the shack. My instruments show a sharp ten-degree temperature drop outside."

Bonnett thumbed his mike switch: "What're you doing up and about, Junior?"

"I'm always nervous when it's your duty," said Ramsey. "I couldn't sleep; so I came in here to run an instrument check."

"Wise guy," said Bonnett.

Sparrow's voice joined them: "Find out how deep it is, Ramsey. If it doesn't extend below our limit, we can hide under it and pick up speed. Ten degrees will cloud a lot of noise."

"Right, skipper." Pause. "Sixty-eight hundred feet, give or take a few."

"Les, take her down," said Sparrow.

Bonnett racked his control console onto the catwalk railing, took electronic hold of the diving planes. Abruptly, his static pressure gauge repeater showed what his sense of balance already had told him: they were going down too fast; an up-current was following them, lifting the tow. Bonnett fought it until they were inclined at a safe three degrees.

The *Ram* leveled at 6780 feet.

In the shack, Ramsey looked at his own repeater for the master pressure gauge: 2922 pounds to the square inch. Instinctively, his gaze went to the pressure hull beside him—a small length of it seen through a maze of pipes and conduits. He tried to fight away from the thought of what would

happen if the hull should implode: bits of protein pulp floating amidst shattered machinery.

What was it Reed had said? It came back to Ramsey clearly, even to the impersonal tones of his instructor's voice: "An implosion of external equipment at extreme depths may set up a shock wave which will split your hull wide open. Of course, it'd be all over for you before you'd hardly realized what happened."

Ramsey shivered.

What is Sparrow's reaction to the increased danger? he wondered. Then: *I don't really care as long as his ability keeps me safe.*

This thought shocked Ramsey. He suddenly looked around his electronics shack as though seeing it for the first time, as though he had just awakened.

What kind of a psychologist am I? What have I been doing?

As though answering a question from outside himself, his mind said: *You've been hiding from your own fears. You've been striving to become an efficient cog in this crew because that way lies a measure of physical safety.*

What am I afraid off? he asked himself.

Back came the answer: *You're afraid of your own personal extinction.*

"It'd be as though I'd died *en utero,*" he said, speaking the thought softly to himself. "Never born at all."

He found that he was trembling, bathed in perspiration. The plug holes of the test board in front of him seemed to stare back—a hundred demanding eyes. He suddenly wanted to scream, found he couldn't move his throat muscles.

If there was an emergency now, I'd be helpless, he thought. *I couldn't move a finger.*

He tried to will the motion of the index finger of his right hand, failed.

If I move, I'll die!

Something touched his shoulder and he almost blanked out in frozen panic. A voice spoke softly beside his ear and it was as though the voice had shouted loud enough to split his eardrums.

"Ramsey. Steady, boy."

A motion in front of his eyes. A hand. Sparrow's.

"You're a brave man, Ramsey. You took it longer than most."

Ramsey found the trembling of his body had become so violent that his vision blurred.

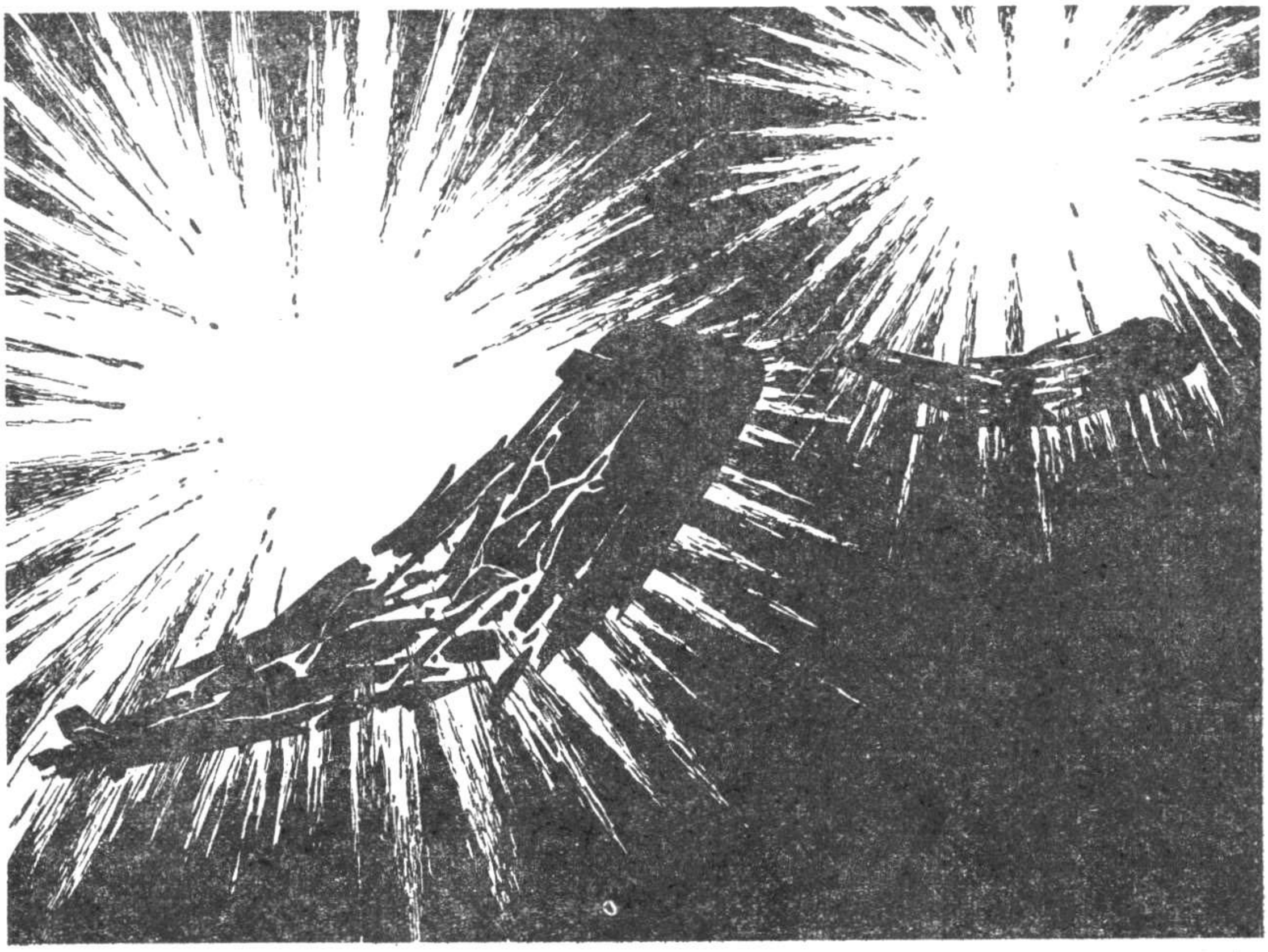
"I've been waiting for this, Ramsey. Every man goes through it down here. Once you've been through it, you're all right."

Deep, fatherly voice. Tender. Compassionate.

With all his being, Ramsey wanted to turn, bury his head against that compassionate chest, sob out his fears in strangled emotion.

"Let it go," said Sparrow. "Let it come. Nobody here but me, and I've been through it."

Slowly at first, then in gasping sobs, the tears came. He bent over the bench, buried his face in his arms. All the time, Sparrow's hand upon



his shoulder, a feeling of warmth from it, a sense of strength.

"I was afraid," whispered Ramsey.

"Show me the man who is not a coward and I will show you a blind man or a dolt," said Sparrow. "We are plagued with too much thinking. It is the price of intelligence."

The hand left Ramsey's shoulder. He heard the shack door open, close.

Ramsey lifted his head, stared at the test board in front of him, the open intercom switch.

Bonnett's voice came from the speaker: "Ramsey, can you give us a sound-distance test now?"

Ramsey cleared his throat. "Right." His hands moved over the board, slowly, then with rapid sureness. "There's enough cold stuff above us to blanket force speed," he said.

The speaker rumbled to Sparrow's voice. "Les, give us force speed. Ramsey, we are within ninety pounds of pressure limit. Remain on watch with Les until you are relieved."

The humming of the *Ram's* electric motors keened up a notch, another.

"Right, skipper," said Ramsey.

Garcia's voice came over the intercom. "What's up? I felt the motors."

"Cold layer," said Sparrow. "We are gaining a few knots while we can."

"Need me?"

"No. Get your rest."

Ramsey heard the voices over the

intercom with a peculiar clarity, saw the board in front of him with a detail that amazed him: tiny scratches, a worn plug line.

Back came the memory of his blue funk and with it, a detail his mind had avoided: Sparrow calling to him over the intercom to make the sound-distance test.

And when I didn't answer, he came immediately to help me.

Another thought intruded: *He knows how green I am—has known all along.*

"Ramsey."

Sparrow stood in the shack doorway.

Ramsey stared at him.

Sparrow entered, sat down on the bench stool beside the door. "What are you, Ramsey?"

He cleared his throat. "What do you mean?"

"Every man has to wrestle with his shadow down here. You held out a long time."

"I don't understand you."

"This life makes you face your fears sooner or later."

"How did you know I was afraid?"

"Every man's afraid down here. It was just a matter of waiting until *you* found out you were afraid. Now, answer my question: What are you?"

Ramsey stared past Sparrow. "Sir, I'm an electronics officer."

A faint smile touched Sparrow's eyes and mouth. "It's a sad world we live in, Ramsey. But at least Security picks its men for their courage." He straightened.

Ramsey accepted this silently.

"Now, let's have a look at that little box of yours," said Sparrow. "I'm curious." He stood up, went out into the companionway, walked aft.

Ramsey followed.

"Why not keep it in the shack?" asked Sparrow.

"I've been using my off time to check it."

"Don't wear yourself out." Sparrow dropped down to the lower level, Ramsey behind him. They entered Ramsey's room. The humming of the induction drive came through the bulkhead.

Ramsey sat down on his bunk, brought out the box, put it on his desk and unlocked it. *Can't let him look too close,* he thought. He noted that the disguise system was working.

Sparrow peered into the box with a puzzled frown.

What'd he expect to find? Ramsey wondered.

"Give me a rundown," said Sparrow.

Ramsey pointed to a dial. "That monitors the sweep of the primary search impulse. The first models were plagued by feedback echo."

Sparrow nodded.

Ramsey indicated a group of signal lights. "These separate the pulse frequencies. They flicker red when we're out of phase. The particular light tells me which circuit is bouncing."

Sparrow straightened, shot a searching glance at Ramsey.

"Tapes inside make a permanent record," said Ramsey.

"We'll go into it at greater length

some other time," said Sparrow. He turned away.

He expected some Security gadget, thought Ramsey.

"Why'd Security plant you on us?" asked Sparrow.

Ramsey remained silent.

Sparrow turned, stared at him with a weighing look. "I won't force the issue now," he said. "Time enough for that when we get home." His face took on a bitter expression. "Security! Half our troubles can be traced to them."

Ramsey maintained his silence.

"It's fortunate you're a good electronics officer," said Sparrow. "Doubtless you were chosen for that quality." A sudden look of indecision passed over his features. "You *are* a Security man, aren't you?"

Ramsey thought, *If he believes that, it'll mask my real position. But I can't just admit it. That'd be out of character.* He said, "I have my orders, sir."

"Of course," said Sparrow. "Stupid of me." Again the look of indecision. "Well, I'll be getting—" Abruptly, he stiffened.

Ramsey fought to keep from showing surprise. The pellet embedded in his neck had just emitted a sharp *ping!* He knew that the identical equipment in Sparrow also had reacted to a signal.

Sparrow whirled to the door, ran forward to the control deck, Ramsey on his heels. They stopped before the big master board. Garcia turned from his position at the monitor controls. "Something wrong, skipper?"

Sparrow didn't answer. Through his mind was running a senseless rhyme born of the twenty kills the EPs had made in the previous months: *Twenty out of twenty is plenty . . . twenty out of twenty is plenty . . .*

Ramsey, standing behind Sparrow, was extremely conscious of the charged feeling in the control room, the stink of the atmosphere, the questioning look on Garcia's face, the clicking of automatic instruments and the answering response of the deck beneath his feet.

The pellet in his neck had begun sending out a rhythmic buzzing.

Garcia stepped away from the board. "What's wrong, skipper?"

Sparrow waved him to silence, turned right. Ramsey followed.

The buzzing deepened. Wrong direction.

"Get a signal snifter," said Sparrow, speaking over his shoulder to Ramsey.

Ramsey turned to the rear bulkhead, pulled a snifter from its rack, tuned it as he rejoined Sparrow. The instrument's speaker buzzed in rhythm to his neck pellet.

Sparrow turned left, Ramsey followed. The sound of the snifter went up an octave.

"Spy beam!" said Garcia.

Sparrow moved toward the dive board, Ramsey still following. The sound from the snifter grew louder. They passed the board and the sound deepened. They turned, faced the

board. Now, the signal climbed another octave.

Ramsey thought, *Garcia was in here alone. Did he set up a signal device.*

"Where's Les?" barked Sparrow.

"Forward," said Garcia.

Sparrow seemed to look through the wall in front of him.

He thinks it may be Bonnett sending that signal, thought Ramsey. With a sudden despair, he wondered, *Could it be?*

Sparrow spoke into his chest microphone: "Les! To the control room! On the double!"

Bonnett acknowledged and they heard a clang of metal as he slipped on the catwalk; then he shut off his microphone.

Ramsey frowned at his snifter. The signal remained stationary although Bonnett was moving. But then a signal device could have been left hidden forward. He moved the snifter to the right, aiming it toward the center of the dive board. The signal remained constant.

Sparrow had followed the motion.

"It's in the board," shouted Ramsey.

Sparrow whirled toward the board. "We may have only a couple of minutes to silence that thing!"

For a mind-chilling instant, Ramsey imagined the enemy wolf packs converging for another kill—twenty-one.

Garcia slammed a tool kit onto the deck at their feet, flipped it open, came out with a screw driver. He began dismantling the cover plate.

Bonnett entered. "What's wrong, skipper?"

"Spy-beam transmitter," said Sparrow. He had found another screw driver, was helping Garcia remove the cover plate.

"Should we take evasive action?" asked Ramsey.

Sparrow shook his head. "No, let them think we don't know about it. Steady as she goes."

"Here," said Garcia. "Pull on that end."

Ramsey reached forward, helped pull the cover plate away from the board, revealing a maze of wiring, transistors, high-pressure tubes.

Bonnett picked up the snifter, passed it in front of the board, stiffened as the signal increased in front of the tube bank.

"Joe, standby on the auxiliary dive board," said Sparrow. "I'm shutting down this whole section."

Garcia darted across to the auxiliary board on the opposite side of the control room. "Auxiliary operating," he called.

"Wait," said Bonnett. He held the search box steady in front of a tube, reached in and pulled the tube from its socket. The signal continued, but now it emanated from Bonnett's hand as he waved the tube in front of the snifter.

"A self-contained power unit in that little thing," gasped Ramsey.

After a silent prayer Sparrow ordered: "Here; give it to me." He took the tube from Bonnett's hand,

gritted his teeth at the heat of the thing.

Bonnett shook the hand which had held the tube. "Burned me!"

Ramsey said, "It was in the Z02R bank."

"Smash it," said Garcia.

Sparrow shook his head. "No." He grinned mirthlessly. "We're going to gamble. Les, take us up to discharge depth."

"Six hundred feet?" asked Bonnett. "We'll be sitting ducks!"

"Do it!" barked Sparrow. He turned to Ramsey, extended the tube. "Anything special about this you could use to identify it?"

Ramsey took the tube, turned it over in his hand. He reached into his breast pocket, pulled out a tiny record camera, began photographing the tube from all angles.

Sparrow noted the ready availability of a record camera, but before he could comment on it, Ramsey said, "I'll have to look at the enlargements." He glanced up at Sparrow. "Do we have time to give this thing a more thorough going over in the shack?"

Sparrow looked to the static pressure gauge. "About ten minutes. Whatever you do, don't stop that signal."

Ramsey whirled, hurried to the shack, Sparrow behind him. He heard Sparrow speaking into a chest mike as they ran.

"Joe, get a garbage disposal container and ready a tube to discharge that spy-beam. With any luck at all, we're going to send the EPs chasing after an ocean current."

Ramsey put a piece of soft felt on his workbench, placed the tube on it.

"If you've ever prayed, pray now," said Sparrow.

"Nothing this small could have an internal power source to give off that much signal," said Ramsey.

"But it does," said Sparrow.

Ramsey paused to wipe perspiration from his hands. A thought flitted through his mind: What will the telemeter record of Sparrow's endocrine balance show this time?

"Devilish thing!" said Sparrow.

"We're playing a big gamble," said Ramsey. He placed calipers over the tube, noted the measurements. "Standard size for the Z02R." He put the tube on a balance scale with another of the same make. The spy tube sank, unbalancing the scale.

"It's heavier than the standard," said Sparrow.

Ramsey moved the balance weights. "Four ounces."

Bonnett's voice came over the bulkhead speaker above their heads: "Estimating discharge depth in four minutes. We've picked up a free ride on a current."

Sparrow said, "Do you think you can find out anything else about that thing?"

"Not without tearing it down," said Ramsey. "Of course, there's a possibility X-ray would show some internal detail we could figure out." He shook his head.

"There'll be more of those

aboard," said Sparrow. "I know there will."

"How?"

Sparrow looked at him. "Call it a hunch. This mission has been marked." He glared at the tube on the bench. "But by all that's sacred, we're going to come through!"

"Two minutes," said Bonnett's voice over the speaker.

Ramsey said, "That's it. Let me examine what we already have."

Sparrow scooped up the tube, said, "Move search out to full limit."

"They may detect our pulse," said Ramsey, then colored as he felt the pulsing response of the speaker in his neck.

Sparrow smiled without mirth, turned, stooped for the door and disappeared down the companionway. Presently, his voice came over the intercom: "We're at the tube and ready to blow this thing, Les. Give me the static gauge readings."

Back came Bonnett's voice: "Four-ninety, four-seventy, four-forty . . . four hundred even!"

Ramsey heard the faint "chug!" of the discharge tube, the sound carried to him through the hull.

Sparrow's voice came ringing over the intercom. "Ride the vents!"

The *Ram's* deck tipped sharply; the humming of the motors climbed through a teeth-grating vibration.

Ramsey looked to the dial showing their sound transmission level. Too high. The silencer planes would never cover it.

Sparrow's voice boomed from the speaker: "Ramsey, take over the internal pressure system on manual. Overcompensate for anticipated depth. We'll worry about Haldane charts and depth sickness later. Right now, I want that cold level and seven thousand feet over us."

Ramsey acknowledged, his hands moving to the controls as he spoke. He glanced at the vampire gauge on his wrist. Diffusion rate low. He stepped up the release of carbonic anhydrase into the atmosphere.

Sparrow again: "Ramsey, we've fired a salvo of homing torps on our back path. Delayed timing. Track the signal if any of them blow."

"Aye, skipper." Ramsey plugged a monitor phone into one of the board circuits ahead of him, glanced to the telltale above it. As he did, he noted that the pellet in his neck had almost lost the sound of the tube behind them. His hands continued to move the internal pressure ahead of the depth requirement. The outside pressure repeater above his head showed twenty-six hundred pounds to the square inch, still climbing. Abruptly, the temperature recorder responded to their entrance into the cold current.

Ramsey spoke into his chest mike: "We're in the cold, skipper."

Back came Sparrow's voice: "We have it here."

Ramsey's pressure repeater climbed through two thousand eight hundred and fifteen pounds, steadied. He felt the deck beneath him come up to level. Relays clicked, a bank of monitor lights flashed green. He sensed the ship around him—a buoyant, al-

most living thing of machines, plastics, gases, fluids . . . and humans. He could hear Sparrow's voice over the open intercom giving orders in the control room.

"Force speed. Change course to fifty-nine degrees, thirty minutes."

The secondary sonoran chart at Ramsey's left noted the course change. Ramsey looked at the red dot marking their position: almost due south of the western tip of Iceland, directly on the sixtieth parallel of latitude. Automatic timelog reading: seven days, four hours, twenty-six minutes from start of mission.

"Ramsey, anything on those fish we sent back?"

"Negative, skipper."

"Stick with the shack. We're going to start tearing down the board. We'll have to check every tube for deviation from standard weight."

"We'll have to go over the shack and the E-stores, too," said Ramsey.

"Later." Sparrow's voice conveyed a calm surety.

Ramsey glanced at his wrist watch, correlated it with the timelog. *What will the telemeter show?* he asked himself. Again, he felt that his mind had made a failing grasp at an elusive piece of knowledge. Something about Sparrow. Ramsey's gaze ranged over the board in front of him. His ears felt tuned for the slightest sound over the monitor phones. He glanced at the oscilloscope in the right bank: only background noise. For a fleeting instant, Ramsey felt that he was one with the ship, that the instruments around him were but extensions of his senses. Then it was gone and he could not recapture the feeling.

In the control room, Sparrow fought down the twitching of a cheek muscle. He replaced a tube in the sonoran system, extracted another, read the code designation from the tube's side: "PY4X4."

Garcia, beside him, ran a finger down a check list: "Fifteen ounces plus."

Sparrow checked it on a balance scale. "Right on." He replaced the tube, said, "You know, when I was in high school they were saying that some day they'd run systems like this with transistors and printed circuits."

"They did for a while," said Garcia.

"Then we got into sweep circuits," said Sparrow. He pulled out an octode cumulator tube, read off the code, checked the weight. "We could still get by with lighter stuff if it weren't for high atmospheric pressures." He went on to another tube. "What we need is a dielectric as tough as plasteel."

"Or an armistice," said Garcia. "Then deep tug equipment would be specialty stuff."

Sparrow nodded, pulled another tube from its socket.

"Skipper, what is that Ramsey?" asked Garcia.

Sparrow paused in the process of weighing a tube, looked at Garcia. "I *think* he's a Security man planted on us."

"That occurred to me," said Garcia. "But have you asked yourself yet

who planted the spybeam on us? He could be a sleeper. He could be, skipper."

Sparrow's hand trembled as he reached for another tube to weigh. He brought back his hand empty, wiped the palm on his shirt, looked down at Garcia. "Joe—" He broke off.

"Yes?"

"Has it ever occurred to you that humanity's basic problem is epitomized in the concept of Security?"

"That's a big mouthful, skipper."

"I mean it, Joe. Look, I know what I am. I can even tell you what my conception of myself is. How you have nothing to fear from me. Les can do the same. And you. And Ramsey." He wet the corners of his mouth with his tongue, stared wide-eyed at Garcia. "And any one of us or all of us could be lying."

"That's not a Security problem, skipper. That's a problem in communications. Ramsey's department."

Sparrow turned back to the board without answering, went on with his patient inspection.

"I'd like to know what that last minute Security inspection of Ramsey was all about," said Garcia.

"Shut up!" barked Sparrow. "Until there's proof positive to the contrary, he's one of us. So are you and Les. And so am I." His mouth twisted in faint amusement. "We're all in the same boat." The lips thinned. "And we've a bigger and more immediate problem." He balanced a tube on the scales, replaced it. "How can we break radio silence to notify home base of what we've discovered?"

A distant dull thump pounded through the hull. A second one.

Ramsey's voice over the intercom: "Skipper! Two hits! Blast pattern identical to our fish!" His voice rose in pitch. "Breaking up noises! Two sources. Skipper! We got two!"

"God forgive us," said Sparrow. "God forgive us."

More thudding sounds resonated through the hull, a strange double beat.

"Anti-torp seekers," said Ramsey. "They've knocked out the rest of our fish."

"Those men didn't stand a chance," said Sparrow. His voice lowered, became almost inaudible: "He that smiteth a man, so that he die, shall be surely put to death. And if a man lie not in wait, but God deliver him unto his hand; then I will appoint thee a place whither he shall flee. But if a man come presumptuously upon his neighbor, to slay him with guile; thou shalt take him from mine altar, that he may die."

Across from him, Bonnett held up a tube. "Joe, what's standard on a GR5?"

Garcia glanced at Sparrow, who turned abruptly back to his examination of the board. "Eight ounces," said Garcia.

"That's what I make it," said Bonnett. "But this one tops thirteen." A tone of suppressed excitement vibrated in his voice.

Sparrow looked aft, lips trembling.

"I think I have one, skipper," said Bonnett.

Garcia had stepped across to Bonnett's side. He took the tube from the first officer.

"There should be a better way to live and a better way to die," said Sparrow. He shuddered, stabbed a glance at Bonnett. "Well, set it aside and see if there are any more!"

Bonnett appeared about to reply, but remained silent. He reclaimed the tube from Garcia, deposited it gently in a padded tray of his tool box.

Sparrow passed a hand across his forehead. His head ached strangely. *Is there a spy aboard?* he asked himself. *Is it Ramsey? Is it Les? Is it Joe? The EPs are hoping we'll lead them to the well.* He looked blankly at the open wiring before him. *Then why set off a tracer now? To test our alertness? The obvious time for a signal would be when we're sitting on top of the well.*

A strange vibration inside his head distracted Sparrow. He was startled to discover he'd been grinding his teeth. *When we're sitting on the well! God help me! How will I prevent it? I can't remain awake the whole time.*

"That's the last one," said Garcia. He indicated a tube which Sparrow had automatically placed in the balance scales.

Sparrow shuddered, drew himself back to the present. "Put it back," he said.

Garcia complied.

Sparrow looked at Bonnett. "Les, start checking the spares in E-stores."

"Aye," said Bonnett.

Sparrow spoke to Garcia: "Stay on watch here."

Garcia nodded. "Are you going to rest, skipper?"

Sparrow shook his head from side to side. "No. No, I have to go back to the shack and help Ram—" He stopped, glanced at Garcia. "We've engaged the enemy and come through." Sparrow stepped to the door leading aft. "I'm going back to help *Johnny* check out the tubes in the shack."

"What about that?" Garcia indicated the tube Bonnett had left in the tray of his toolbox.

Sparrow returned, picked up the tube, went back to the door, looked at the tube. "We'll have a look. Maybe it'll tell us something." He glanced at Garcia. "You be thinking about how we can contact base."

He was gone through the door.

Garcia clenched his fists, turned to face the master board. His gaze fell on the sonoran chart and its marker: a red insect creeping across the vastness. *Where? Where's the well?*

Ramsey looked up from his instruments as Sparrow entered. "Anything new, skipper?"

"Les found this." Sparrow placed the tube on the felt padding of Ramsey's bench. "It's five ounces over."

Ramsey looked at the tube without touching it. "Has it occurred to you that thing could be set to explode on tampering?"

"Some of the old Salem sea captains used to attend their own funerals before embarking," said Sparrow. "Figuratively, I'm in the same frame of mind."

"That's not what I meant," said Ramsey. "A half ounce of nitrox could get us both. Maybe you'd better leave me alone with it."

Sparrow frowned, shrugged. He thumbed his chest mike: "Joe, Les—hear this. This tube may be booby-trapped. If anything happens to Johnny and me, you two drop the tow and head for home. That's an order."

Johnny! thought Ramsey. *He called me Johnny!* And then he remembered: *We've met the enemy. The old magic is dead. Enter the new magic.*

"We'll want a record of this," said Sparrow. He took a camera from a drawer, racked it above the bench, focused it. "O.K.," he said. "You're the expert on these gadgets."

Ramsey spoke without looking up from the tube. "A half hour of just looking at this thing, studying all the angles, could mean the difference between success and failure."

"What're we looking for?"

"I don't really know. Something different. Something that hits a sour note."

Sparrow bent over the bench, grabbed a handhold as the *Ram*'s deck slanted to the upflow of an undersea current. Ramsey steadied the tube with one hand, brought up folds of the felt padding to keep the tube from rolling. The amber light of a

temperature gradient indicator on the board ahead of them flashed off, on, off.

Ramsey switched on the thermo-repeater above the light: thirty-four degrees.

Sparrow nodded at the repeater. "The Arctic bottom drift. It's full of food. There'll be a sonic curtain of sea life above us." He smiled. "We can breathe a bit easier."

Ramsey shook his head. "Not with that thing to solve." He stared at the tube on the bench. "If you were going to trigger that tube to explode, how would you do it?"

"A tiny wire maybe. Break it and—"

"Maybe," said Ramsey. "A better way would be to set a trigger keyed to pressure change—if the vacuum breaks." He straightened. "First some infra and X pictures. Then we'll rig a vacuum jar with remote controls, handle the tube in the vacuum. After that we'll break the seal."

Sparrow touched the tube with one long finger of his left hand. "Looks like standard heavy-pressure glass."

"I don't understand something," said Ramsey. He spoke as he worked, setting up the portable infra-camera on the bench. "Why did this thing start when it did? That wasn't smart. The clever thing would've been to wait until we reached the well."

"My idea exactly," said Sparrow.

Ramsey focused the camera. "How much longer until we reach it?"

The casual way of the question caught Sparrow off balance. He looked up to the shack sonoran chart, started to say, "It's on the flank of—" He froze.

Ramsey made an exposure, turned the tube to a new angle.

He's too casual, thought Sparrow.

"You were saying." Ramsey spoke without looking up from the tube.

"Mr. Ramsey, a subtug's destination is known only to its commander until the immediate area of that destination is reached."

Ramsey straightened. "That's a stupid order. If something happened to you, we couldn't go on."

"Are you suggesting I should confide our destination in you?"

Ramsey hesitated, thought: *What would happen if I indicated to Sparrow that I already know it? It'd confirm his opinion that I'm Security.*

"Well?"

"Skipper, I asked you a civil question. Phrased a bit loosely, perhaps. What I want to know is how much longer until we reach Novaya Zemlya?"

Sparrow held himself in rigid control, thinking: *Security? A spy trying to draw me out with a clever guess?* He said, "I don't see where it's your concern how long it takes us to get anywhere."

Ramsey returned his attention to the tube. *Is he convinced that I'm a Security officer?*

I could ask him for the exact coördinates, thought Sparrow. *But would it prove anything if he doesn't know them? Or if he does know them?*

Ramsey set up a bell jar and vacuum pump, the tube resting on the black mastic sealer inside the jar. He

removed the jar, set up a small remote-control console, replaced the jar.

Sparrow watched carefully, still undecided about Ramsey.

"This is going to be slow," said Ramsey.

Wish I only knew! thought Sparrow. *Is he a spy? How can I tell? He doesn't really act like one.*

Ramsey locked a stool in place before the bench, sat down. "Slow and easy," he said.

Sparrow studied him. *It could be a clever act. I'll get busy checking his tubes, watch him.* He said, "I'll start checking out your tubes." He removed a cover plate at the left, found scales, began pulling tubes, weighing them.

Minutes ticked away—an hour, two hours . . . two hours and forty minutes. Inside the bell jar, the parts of the tube were laid out in rows. Sparrow long since had finished his job, was watching the work at the bench.

"No booby trap," said Ramsey. He activated a magnet arm inside the jar, lifted a grid section. "And I still don't see how they rigged this thing to go off. This looks like standard stuff." He rotated the part on the magnet. "There's nothing arranged to fuse with an overload. Nothing extra at all except that micro-vibrator and its capacitor power source." He replaced the grid section. "Our boys are going to want to see that." He picked up a cathode segment, turned it over, set it down. "No trigger. How was it done?"

Sparrow looked to the camera which had been capturing every movement of the examination, turned back to Ramsey. "We have another problem."

"What's that?" Ramsey straightened, rubbed the small of his back.

Sparrow slid off his stool. "How are we going to get word of this back to base? If the EPs get us, the things we've discovered are lost. But I have an iron-clad order against breaking radio silence."

Ramsey stretched his back. "Do you trust me, skipper?"

Before he could stop himself, Sparrow said, "No." He frowned.

Ramsey grinned. "I'm still the one with the solution to your problem."

"Let's have it."

"Put the whole story onto a squirt repeater and—"

"Squirt repeater?"

Ramsey bit his lip, coughed. *Damn! Another BuPsych-Security secret.* It had slipped out.

"I've never heard of a squirt repeater," said Sparrow.

"It's something new in . . . uh . . . electronics. You code a message onto ultra-stable slow tape, then speed up the tape. You set the message to repeat—over and over—a little squirt of sound. It's recorded at the receiver end, slowed for playback and translation."

"That's still breaking radio silence."

Ramsey shook his head. "Not if the message is broadcast by a little set in a floater rigged to start transmitting long after we've gone."

Sparrow's jaw fell. He snapped his mouth shut. Then: "Could you rig it?"

Ramsey looked around him. "We have all the essentials right here."

Sparrow said, "I'll send Garcia in to help you."

Ramsey said, "I won't need any help with—"

"He'll help you anyway."

Again Ramsey grinned. "That's right. You don't trust me."

In spite of himself, Sparrow grinned back at the amusement in Ramsey's face; then wiped the grin from his features and from his thoughts. His brows drew together. *Is this all an act on Ramsey's part?* he wondered. *Amuse me. Throw me off guard. It could be.*

Ramsey glanced at the wall chrono. "My watch." He indicated the parts in the bell jar. "This'll keep."

"I'll stand your watch," said Sparrow. He thumbed his chest mike. "Joe, come to the shack. Johnny's figured out how to get a message to home base. I want you to help him."

"This shouldn't take more than a couple of hours," said Ramsey. "It's really a simple rig. I'll report in as soon as we've finished."

Sparrow pursed his lips in thought, stared solemnly at Ramsey. "There's something else. I'm instituting a new watch procedure: two men on duty at all times, never to leave actual sight of each other."

Ramsey's eyes widened. "There are only four of us, skipper."

"It'll be rough," said Sparrow. "We'll stagger the watches, change the second man in mid-watch."

"That's not what I meant," said Ramsey. "It'll be more than rough. There are only four of us. Isolated. Under your plan, we'll obviously be watching each other. When you watch another man it tends to make you suspicious. Suspicion sets up a paranoic situation where—"

"Your reluctance to accept an order for the general safety is being noted and will be entered in the log," said Sparrow.

Ramsey's face took on a look of watchful remoteness. He thought: *Take it easy. This is the paranoic leaning that Obe mentioned.* He said, "Efficiency will suffer if we're—"

"I'm still the captain of this vessel," said Sparrow.

"Yes, *captain,*" said Ramsey. He made the title sound faintly reproachful.

Sparrow's lips thinned. He whirled, left the shack, hurried aft to his quarters, bolted the door behind him. He sat down on his bunk, swung the folding desk into position. The faint whispering of the induction drive resonated through the wall behind him. The *Ram* had an uncertain, shifting motion: the bottom turbulence of the Arctic current.

He thought: *We've a spy aboard. It's obvious someone activated that spybeam. I wish I'd had Joe checking Ramsey when he opened that tube. He says there was no internal trigger system in the thing, but he could've hidden something from me.*

From a recess in his desk, Sparrow removed his private log, opened it to a clean page, smoothed the log flat. He took his pen and, in a neat cramped hand, wrote the date, then: "This date Lt. John Ramsey made objection to a security procedure designed to—"

He paused, remembering that he'd ordered Garcia to the shack. He thumbed the switch on his chest mike: "Joe, are you in the shack?"

Garcia's voice came out of the wall speaker: "Righto."

"Just checking," said Sparrow. "Would you have a look at that spybeam, see if there's anything about it we may have missed?"

"Righto, skipper. Been doing just that."

"That's all," said Sparrow. He turned back to his log.

In the shack, Garcia looked up from the bell jar. "You're dead right, Johnny-O. No trigger."

"What's that thing look like to you?" asked Ramsey.

"Only one thing it could be," said Garcia. "A relay amplifier."

Ramsey nodded. "Right. The actual signal's coming from some place else."

"It'd have to be close," said Garcia. "Just giving you a free-hand estimated-type guess, I'd say within ten feet."

Ramsey rubbed the back of his neck.

"What're you wearing a phone for?" asked Garcia. He nodded toward the monitor-phone in Ramsey's left ear.

"Monitor on the seismo," said Ramsey. "If another spybeam goes off—"

"Good idea."

Ramsey brought his hand around to the side of his neck, passing it over the faint scar which covered the pellet-speaker imbedded there. "What'd you find in spare?" he asked.

Garcia shook his head. "Nothing."

"Skipper checked the shack while I was dismantling that tube," said Ramsey. "Negative here, too."

"Hadn't you better get started?" asked Garcia.

"Huh?"

"Building your little gadget."

"Sure." Ramsey turned back to his bench. As he turned, the speaker above the seismoscope rasped to an upper-range sound. Ramsey's eyes snapped to the scope. The pulsing green line made a sharp upsweep, repeated.

Bonnett's voice came over the speaker from the control deck: "Skipper!"

Sparrow's firm tones: "What is it, Les?"

"Seismic shock somewhere astern."

"I have it here," said Ramsey. "Torp blast. It's in the same range as the EPs' 24-K fish." He scribbled some figures on a notepad, picked up a slide rule, set it, read it. "About a hundred miles astern. Well within the range of drift for that little package we left behind us."

"Would they waste a torp on that little thing?" asked Sparrow, then answered his own question. "What's

the matter with me? Of course they would. All they'd see on their gear would be the signal. They'd think it was us lying doggo."

"That's the way I figure it," said Ramsey. He looked at Garcia. "What do you say, Joe?"

Garcia was trembling, face pale. He shook his head.

Ramsey stared at him questioningly.

Sparrow's voice boomed from the speaker: "All hands—as soon as I am finished with work I have here, I will relieve Mr. Bonnett." There was the sound of a throat being cleared.

Ramsey glanced at the wall chrono. "About time. Les has been on two straight watches now."

The skipper's voice continued: "At that time I will post a new watch schedule in the wardroom. It is to go into effect immediately."

Garcia had brought himself under control. He said, "What's eating the skipper? He sounds angry."

Ramsey outlined the new watch schedule.

"What!" said Garcia. "As if we weren't nuts enough already!"

Ramsey stared at him. *That was an odd reaction for an engineering officer,* he thought. *For a psychologist, O.K. But not for Garcia.*

In his quarters, Sparrow wrote: "I must make certain there is no opportunity for anyone to activate a spy signal when we reach the well." He penned his signature, went back and made the final period an exclamation point, closed the log and returned it to its hiding place.

The timelog repeater on his cabin bulkhead showed seven days, nine hours, twenty-three minutes from point of departure.

Sparrow stood up slowly, left his room, closing the door meticulously behind him. He turned, strode forward to the wardroom. As he passed the shack, he heard Ramsey saying: "This stabilizes the micro-timing of the take-up spool. It has to be right on."

Garcia's answer was lost to Sparrow as he stepped into the wardroom, closing the door meticulously behind him.

They dropped the signal squirter in the next watch. Sparrow noted the time—seven days, ten hours, forty-eight minutes—and entered it in the main logbook. He added the position from the sonoran chart: sixty-one degrees, fifty-eight minutes North latitude, seventeen degrees, thirty-two minutes west longitude. The squirter was set for a four-hour delay.

"Very good, Johnny," he said. There was no warmth in his tone.

Ramsey said, "We make do with what we have."

"Let us pray that it works," said Sparrow. He looked at Garcia. "But we won't count on it."

Garcia shrugged. "It *could* work," he said. "If anybody hears it." He stared coldly at Ramsey.

Sparrow thought, *Joe's suspicious. If Ramsey's a spy, he'd key that squirter to a wave length the EPs are listening to. It'll tell them we're onto the spybeam and they'll redouble their patrols!*

"Am I relieved now?" asked Ramsey.

"Until your watch," said Sparrow. He stared after Ramsey.

In his quarters, Ramsey brought out the telemeter box, examined the tapes. Sweeping disturbance lines hit his eyes. Now Sparrow was reacting. But what reactions! They reminded Ramsey of a feedback record. Each succeeding wave worse than the one before. The whole area from the discovery of the spybeam was a scrambled record of disturbance.

The room seemed to grow smaller around Ramsey, pressing in upon him.

Sparrow's losing touch with reality. I'll have to do something. But what?

He took deep breaths to calm himself, forced his mind to orderly channels.

I've been with Sparrow a week. I've observed him in all manner of stress. The big elements should be in my hands by now: enough to make some kind of a plan of action. What do we have here?

He made a mental list:

We started out with evidence of rigid self-control.

But only after we knew that he could react.

There is some indication of religious-paranoia.

A tendency to paranoic type was Obe's earlier classification.

But there are things that don't fit the pattern.

He thinks clearly in a stress situation where you'd expect a breakdown.

Extremely masculine type. A leader.

But not totally despotic, or even nearly so.

And he's a brilliant submariner. At times you'd think the ship was a part of him or vice versa. That he was a built-in component: Captain, Submariner type; Mark I. Portable.

Ramsey's back stiffened. *Part of the ship. Mechanical. What better way to describe rigid self-control?*

He recalled his own feeling of synchronous intermingling with the ship. Fleeting as that had been—one instant in the shack. And then gone beyond recapture.

I'd be a strong survival adaptation.

Captain, Submariner type; Mark I. Portable. That may be closer than I'd imagined.

He rubbed at a burning sensation in his eyes, glanced at his wrist watch. Two hours until his next watch and he was aching with fatigue. He put away the telemeter, flopped sideways onto his bunk. Almost immediately, he was asleep and dreaming.

A giant surgeon with Sparrow's face bent over him in his dream. Little wires. Nerves. One here. One there. Soon he'll be built into the ship.

Electronics officer, Submariner type; Mark I. Portable.

TO BE CONTINUED

NOBODY BOTHERS GUS

Nobody was angry at Gus, and nobody was afraid of him, or tried . . . well, tried anything. They just didn't . . . hm-m-m, lessee . . . who were we talking about?

BY PAUL JANVIER

Illustrated by Freas

Two years earlier, Gus Kusevic had been driving slowly down the narrow back road into Boonesboro.

It was good country for slow driving, particularly in the late spring. There was nobody else on the road. The woods were just blooming into a deep, rich green as yet unburned by summer, and the afternoons were still cool and fresh. And, just before he reached the Boonesboro town line, he saw the locked and weathered cottage standing for sale on its quarter-acre lot.

He had pulled his roadcar up to a gentle stop, swung sideways in his seat, and looked at it.

It needed paint; the siding had gone from white to gray, and the trim was faded. There were shingles missing here and there from the roof, leaving squares of darkness on

the sun-bleached rows of cedar, and, inevitably, some of the windowpanes had cracked. But the frame hadn't slouched out of square, and the roof hadn't sagged. The chimney stood up straight.

He looked at the straggled clumps and windrowed hay that were all that remained of the shrubbery and the lawn. His broad, homely face bunched itself into a quiet smile along its well-worn seams. His hands itched for the feel of a spade.

He got out of the roadcar, walked across the road and up to the cottage door, and copied down the name of the real estate dealer listed on the card tacked to the doorframe.

Now it was almost two years later, early in April, and Gus was topdressing his lawn.

Earlier in the day he'd set up a screen beside the pile of topsoil behind his house, shoveled the soil through the screen, mixed it with broken peat moss, and carted it out to the lawn, where he left it in small piles. Now he was carefully raking it out over the young grass in a thin layer that covered only the roots, and let the blades peep through. He intended to be finished by the time the second half of the Giants-Kodiaks doubleheader came on. He particularly wanted to see it because Halsey was pitching for the Kodiaks, and he had something of an avuncular interest in Halsey.

He worked without waste motion or excess expenditure of energy. Once or twice he stopped and had a beer in the shade of the rose arbor he'd put up around the front door. Nevertheless, the sun was hot; by early afternoon, he had his shirt off.

Just before he would have been finished, a battered flivver settled down in front of the house. It parked with a flurry of its rotors, and a gangling man in a worn serge suit, with thin hair plastered across his tight scalp, climbed out and looked at Gus uncertainly.

Gus had glanced up briefly while the flivver was on its silent way down. He'd made out the barely-legible "Falmouth County Clerk's Office" lettered over the faded paint on its door, shrugged, and gone on with what he was doing.

Gus was a big man. His shoulders were heavy and broad; his chest was deep, grizzled with thick, iron-gray hair. His stomach had gotten a little heavier with the years, but the muscles were still there under the layer of flesh. His upper arms were thicker than a good many thighs, and his forearms were enormous.

His face was seamed by a network of folds and creases. His flat cheeks were marked out by two deep furrows that ran from the sides of his bent nose, merged with the creases bracketing his wide lips, and converged toward the blunt point of his jaw. His pale blue eyes twinkled above high cheekbones which were covered with wrinkles. His close-cropped hair was as white as cotton.

Only repeated and annoying exposure would give his body a tan, but his face was permanently browned.

The pink of his body sunburn was broken in several places by white scar tissue. The thin line of a knife cut emerged from the tops of his pants and faded out across the right side of his stomach. The other significant area of scarring lay across the uneven knuckles of his heavy-fingered hands.

The clerk looked at the mailbox to make sure of the name, checking it against an envelope he was holding in one hand. He stopped and looked at Gus again, mysteriously nervous.

Gus abruptly realized that he probably didn't present a reassuring appearance. With all the screening and raking he'd been doing, there'd been a lot of dust in the air. Mixed with perspiration, it was all over his face, chest, arms, and back. Gus knew he didn't look very gentle even at his cleanest and best-dressed. At the moment, he couldn't blame the clerk for being skittish.

He tried to smile disarmingly.

The clerk ran his tongue over his lips, cleared his throat with a slight cough, and jerked his head toward the mailbox. "Is that right? You Mr. Kusevic?"

Gus nodded. "That's right. What can I do for you?"

The clerk held up the envelope. "Got a notice here from the County Council," he muttered, but he was obviously much more taken up by his effort to equate Gus with the rose arbor, the neatly edged and carefully tended flower beds, the hedges, the flagstoned walk, the small goldfish pond under the willow tree, the white-painted cottage with its window boxes and bright shutters, and the curtains showing inside the sparkling windows.

Gus waited until the man was through with his obvious thoughts, but something deep inside him sighed quietly. He had gone through this moment of bewilderment with so many other people that he was quite accustomed to it, but that is not the same thing as being oblivious.

"Well, come on inside," he said after a decent interval. "It's pretty hot out here, and I've got some beer in the cooler."

The clerk hesitated again. "Well, all I've got to do is deliver this notice—" he said, still looking around. "Got the place fixed up real nice, don't you?"

Gus smiled. "It's my home. A man likes to live in a nice place. In a hurry?"

The clerk seemed to be troubled by something in what Gus had said. Then he looked up suddenly, obviously just realizing he'd been asked a direct question. "Huh?"

"You're not in any hurry, are you? Come on in; have a beer. Nobody's expected to be a ball of fire on a spring afternoon."

The clerk grinned uneasily. "No . . . nope, guess not." He brightened. "O. K.! Don't mind if I do."

Gus ushered him into the house, grinning with pleasure. Nobody'd seen the inside of the place since he'd fixed it up; the clerk was the first visitor he'd had since moving in.

There weren't even any delivery men; Boonesboro was so small you had to drive in for your own shopping. There wasn't any mail carrier service, of course—not that Gus ever received any mail.

He showed the clerk into the living room. "Have a seat. I'll be right back." He went quickly out to the kitchen, took some beer out of the cooler, loaded a tray with glasses, a bowl of chips and pretzels, and the beer, and carried it out.

The clerk was up, looking around the library that covered two of the living room walls.

Looking at his expression, Gus realized with genuine regret that the man wasn't the kind to doubt whether an obvious clod like Kusevic had read any of this stuff. A man like that could still be talked to, once the original misconceptions were knocked down. No, the clerk was too plainly mystified that a grown man would fool with books. Particularly a man like Gus; now, one of these kids that messed with college politics, that was something else. But a grown man oughtn't to act like that.

Gus saw it had been a mistake to expect anything of the clerk. He should have known better, whether he was hungry for company or not. He'd *always* been hungry for company, and it was time he realized, once and for all, that he just plain wasn't going to find any.

He set the tray down on the table, uncapped a beer quickly, and handed it to the man.

"Thanks," the clerk mumbled. He took a swallow, sighed loudly, and wiped his mouth with the bank of his hand. He looked around the room again. "Cost you a lot to have all this put in?"

Gus shrugged. "Did most of it myself. Built the shelves and furniture; stuff like that. Some of the paintings I had to buy, and the books and records."

The clerk grunted. He seemed to be considerably ill at ease, probably because of the notice he'd brought, whatever it was. Gus found himself wondering what it could possibly be, but, now that he'd made the mistake of giving the man a beer, he had to wait politely until it was finished before he could ask.

He went over to the TV set. "Baseball fan?" he asked the clerk.

"Sure!"

"Giants-Kodiaks ought to be on." He switched the set on and pulled up a hassock, sitting on it so as not to get one of the chairs dirty. The clerk wandered over and stood looking at the screen, taking slow swallows of his beer.

The second game had started, and Halsey's familiar figure appeared on the screen as the set warmed up. The lithe young lefthander was throwing with his usual boneless motion, apparently not working hard at all, but the ball was whipping past the batters with a sizzle that the home plate microphone was picking up clearly.

Gus nodded toward Halsey. "He's quite a pitcher, isn't he?"

The clerk shrugged. "Guess so. Walker's their best man, though."

Gus sighed as he realized he'd forgotten himself again. The clerk wouldn't pay much attention to Halsey, naturally.

But he was getting a little irritated at the man, with his typical preconceptions of what was proper and what wasn't, of who had a right to grow roses and who didn't.

"Offhand," Gus said to the clerk, "could you tell me what Halsey's record was, last year?"

The clerk shrugged. "Couldn't tell you. Wasn't bad—I remember that much. 13-7, something like that."

Gus nodded to himself. "Uh-huh. How'd Walker do?"

"Walker! Why, man, Walker just won something like twenty-five games, that's all. And three no-hitters. How'd Walker do? Huh!"

Gus shook his head. "Walker's a good pitcher, all right—but he didn't pitch any no-hitters. And he only won eighteen games."

The clerk wrinkled his forehead. He opened his mouth to argue and then stopped. He looked like a surething bettor who'd just realized that his memory had played him a trick.

"Say—I think you're right! Huh! Now what the Sam Hill made me think Walker was the guy? And you know something—I've been talking about him all winter, and nobody once called me wrong?" The clerk scratched his head. "Now, *somebody* pitched them games! Who the dickens was it?" He scowled in concentration.

Gus silently watched Halsey strike out his third batter in a row, and his face wrinkled into a slow smile. Halsey was still young; just hitting his stride. He threw himself into the game with all the energy and enjoyment a man felt when he realized he was at his peak, and that, out there on the mound in the sun, he was as good as any man who ever had gone before him in this profession.

Gus wondered how soon Halsey would see the trap he'd set for himself.

Because it wasn't a contest. Not for Halsey. For Christy Mathewson, it had been a contest. For Lefty Grove and Dizzy Dean, for Bob Feller and Slats Gould, it had been a contest. But for Halsey it was just a complicated form of solitaire that always came out right.

Pretty soon, Halsey'd realize that you can't handicap yourself at solitaire. If you knew where all the cards are; if you knew that unless you deliberately cheated against yourself, you couldn't help but win — what good was it? One of these days, Halsey'd realize there wasn't a game on Earth he couldn't beat; whether it was a physical contest, organized and formally recognized as a game, or whether it was the billion-triggered pinball machine called Society.

What then, Halsey? What then? And if you find out, please, in the name of whatever kind of brotherhood we share, let me know.

The clerk grunted. "Well, it don't matter, I guess. I can always look it up in the record book at home."

Yes, you can, Gus commented silently. But you won't notice what it says, and, if you do, you'll forget it and never realize you've forgotten.

The clerk finished his beer, set it down on the tray, and was free to remember what he'd come here for. He looked around the room again, as though the memory were a cue of some kind.

"Lot of books," he commented.

Gus nodded, watching Halsey walk out to the pitcher's mound again.

"Uh . . . you read 'em all?"

Gus shook his head.

"How about that one by that Miller fellow? I hear that's a pretty good one."

So. The clerk had a certain narrow interest in certain aspects of certain kinds of literature.

"I suppose it is," Gus answered truthfully. "I read the first three pages, once." And, having done so, he'd known how the rest of it was going to go, who would do what when, and he'd lost interest. The library had been a mistake, just one of a dozen similar experiments. If he'd wanted an academic familiarity with human literature, he could just as easily have picked it up by browsing through bookstores, rather than buying the books and doing substantially the same thing at home. He couldn't hope to extract any emotional empathies, no matter what he did.

Face it, though; rows of even useless books were better than bare wall. The trappings of culture were a bulwark of sorts, even though it was a learned culture and not a *felt* one, and meant no more to him than the culture of the Incas. Try as he might, he could never be an Inca. Nor even a Maya or an Aztec, or any kind of kin, except by the most tenuous of extensions.

But he had no culture of his own. There was the thing; the emptiness that nevertheless ached; the rootlessness, the complete absence of a place to stand and say: "This is my own."

Halsey struck out the first batter in the inning with three pitches. Then he put a slow floater precisely where the next man could get the best part of his bat on it, and did not even look up as the ball screamed out of the park. He struck out the next two men with a total of eight pitches.

Gus shook his head slowly. That was the first symptom; when you didn't bother to be subtle about your handicapping any more.

The clerk held out the envelope. "Here," he said brusquely, having finally shilly-shallied his resolution up to the point of doing it despite his obvious nervousness at Gus' probable reaction.

Gus opened the envelope and read the notice. Then, just as the clerk had been doing, he looked around the room. A dark expression must have flickered over his face, because the clerk became even more hesitant. "I . . . I want you to know I regret this. I guess all of us do."

Gus nodded hastily. "Sure, sure." He stood up and looked out the front

window. He smiled crookedly, looking at the top-dressing spread carefully over the painstakingly rolled lawn, which was slowly taking form on the plot where he had plowed last year and picked out pebbles, seeded and watered, shoveled topsoil, laid out flower beds . . . ah, there was no use going into that now. The whole plot, cottage and all, was condemned, and that was that.

"They're . . . they're turnin' the road into a twelve-lane freight highway," the clerk explained.

Gus nodded absently.

The clerk moved closer and dropped his voice. "Look—I was told to tell you this. Not in writin'." He sidled even closer, and actually looked around before he spoke. He laid his hand confidentially on Gus' bare forearm.

"Any price you ask for," he muttered, "is gonna be O. K., as long as you don't get too greedy. The county isn't paying this bill. Not even the state, if you get what I mean."

Gus got what he meant. Twelve-lane highways aren't built by anything but national governments.

He got more than that. National governments don't work this way unless there's a good reason.

"Highway between Hollister and Farnham?" he asked.

The clerk paled. "Don't know for sure," he muttered.

Gus smiled thinly. Let the clerk wonder how he'd guessed. It couldn't be much of a secret, anyway—not after the grade was laid out and the purpose became self-evident. Besides, the clerk wouldn't wonder very long.

A streak of complete perversity shot through Gus. He recognized its source in his anger at losing the cottage, but there was no reason why he shouldn't allow himself to cut loose.

"What's your name?" he asked the clerk abruptly.

"Uh . . . Harry Danvers."

"Well, Harry, suppose I told you I could stop that highway, if I wanted to? Suppose I told you that no bulldozer could get near this place without breaking down, that no shovel could dig this ground, that sticks of dynamite just plain wouldn't explode if they tried to blast? Suppose I told you that if they did put in the highway, it would turn soft as ice cream if I wanted it to, and run away like a river?"

"Huh?"

"Hand me your pen."

Danvers reached out mechanically and handed it to him. Gus put it between his palms and rolled it into a ball. He dropped it and caught it as it bounced up sharply from the soft, thick rug. He pulled it out between his fingers, and it returned to its cylindrical shape. He unscrewed the cap, flattened it out into a sheet between two fingers, scribbled on it, rolled it back into a cap, and, using his fingernail to draw out the ink which was now part of it, permanently inscribed Danvers' name just below the surface of the metal. Then he screwed the cap on again and handed the pen back to the county clerk. "Souvenir," he said.

The clerk looked down at it.

"Well?" Gus asked. "Aren't you curious about how I did it and what I am?"

The clerk shook his head. "Good trick. I guess you magician fellows must spend a lot of time practicing, huh? Can't say I could see myself spendin' that much working time on a hobby."

Gus nodded. "That's a good, sound, practical point of view," he said. Particularly when all of us automatically put out a field that damps curiosity, he thought. What point of view *could* you have?

He looked over the clerk's shoulder at the lawn, and one side of his mouth twisted sadly.

Only God can make a tree, he thought, looking at the shrubs and flower beds. Should we all, then, look for our challenge in landscape gardening? Should we become the gardeners of the rich humans in their expensive houses, driving up in our old, rusty trucks, oiling our lawnmowers, kneeling on the humans' lawns with our clipping shears, coming to the kitchen door to ask for a drink of water on a hot summer day?

The highway. Yes, he could stop the highway. Or make it go around him. There was no way of stopping the curiosity damper, no more than there was a way of willing his heart to stop, but it could be stepped up. He could force his mind to labor near overload, and no one would ever even *see* the cottage, the lawn, the rose arbor, or the battered old man, drinking his beer. Or rather, seeing

them, would pay them absolutely no attention.

But the first time he went into town, or when he died, the field would be off, and then what? Then curiosity, then investigation, then, perhaps a fragment of theory here or there to be fitted to another somewhere else. And then what? Pogrom?

He shook his head. The humans couldn't win, and would lose monstrously. *That* was why he couldn't leave the humans a clue. He had no taste for slaughtering sheep, and he doubted if his fellows did.

His fellows. Gus stretched his mouth. The only one he could be sure of was Halsey. There had to be others, but there was no way of finding them. They provoked no reaction from the humans; they left no trail to follow. It was only if they showed themselves, like Halsey, that they could be seen. There was, unfortunately, no private telepathic party line among them.

He wondered if Halsey hoped someone would notice him and get in touch. He wondered if Halsey even suspected there were others like himself. He wondered if anyone had noticed *him,* when Gus Kusevic's name had been in the papers occasionally.

It's the dawn of my race, he thought. The first generation—or is it, and does it matter?—and I wonder where the females are.

He turned back to the clerk. "I want what I paid for the place," he said. "No more."

The clerk's eyes widened slightly, then relaxed, and he shrugged. "Suit yourself. But if it was me, I'd soak the government good."

Yes, Gus thought, you doubtless would. But I don't want to, because you simply don't take candy from babies.

So the superman packed his bags and got out of the human's way. Gus choked a silent laugh. The damping field. The damping field. The thrice-cursed, ever-benevolent, foolproof, autonomic, protective damping field.

Evolution had, unfortunately, not yet realized that there was such a thing as human society. It produced a being with a certain modification from the human stock, thereby arriving at practical psi. In order to protect this feeble new species, whose members were so terribly sparse, it gave them the perfect camouflage.

Result: When young Augustin Kusevic was enrolled in school, it was discovered that he had no birth certificate. No hospital recalled his birth. As a matter of brutal fact, his human parents sometimes forgot his existence for days at a time.

Result: When young Gussie Kusevic tried to enter high school, it was discovered that he had never entered grammar school. No matter that he could quote teachers' names, textbooks, or classroom numbers. No matter if he could produce report cards. They were misfiled, and the anguished interviews forgotten. No one doubted his existence—people remembered the fact of his being, and the fact of his having acted and being acted upon. But only as though

they had read it in some infinitely boring book.

He had no friends, no girl, no past, no present, no love. He had no place to stand. Had there been such things as ghosts, he would have found his fellowship there.

By the time of his adolescence, he had discovered an absolute lack of involvement with the human race. He studied it, because it was the salient feature of his environment. He did not live with it. It said nothing to him that was of personal value; its motivations, morals, manners and morale did not find responsive reactions in him. And his, of course, made absolutely no impression on it.

The life of the peasant of ancient Babylon is of interest to only a few historical anthropologists, none of whom actually want to *be* Babylonian peasants.

Having solved the human social equation from his dispassionate viewpoint, and caring no more than the naturalist who finds that deer are extremely fond of green aspen leaves, he plunged into physical release. He discovered the thrill of picking fights and winning them; of *making* somebody pay attention to him by smashing his nose.

He might have become a permanent fixture on the Manhattan docks, if another longshoreman hadn't slashed him with a carton knife. The cultural demand on him had been plain. He'd had to kill the man.

That had been the end of unregulated personal combat. He discovered, not to his horror but to his disgust, that he could get away with murder. No investigation had been made; no search was attempted.

So that had been the end of that, but it had led him to the only possible evasion of the trap to which he had been born. Intellectual competition being meaningless, organized sports became the only answer. Simultaneously regulating his efforts and annotating them under a mound of journalistic record-keeping, they furnished the first official continuity his life had ever known. People still forgot his accomplishments, but when they turned to the records, his name was undeniably there. A dossier can be misfiled. School records can disappear. But something more than a damping field was required to shunt aside the mountain of news copy and statistics that drags, ball-like, at the ankle of even the mediocre athlete.

It seemed to Gus—and he thought it a great deal—that this chain of progression was inevitable for any male of his kind. When, three years ago, he had discovered Halsey, his hypothesis was bolstered. But what good was Halsey to another male? To hold mutual consolation sessions with? He had no intention of ever contacting the man.

The clerk cleared his throat. Gus jerked his head around to look at him, startled. He'd forgotten him.

"Well, guess I'll be going. Remember, you've only got two months."

Gus gestured noncommittally. The man had delivered his message. Why

didn't he acknowledge he'd served his purpose, and go?

Gus smiled ruefully. What purpose did *homo nondescriptus* serve, and where was he going? Halsey was already walking downhill along the well-marked trail. *Were* there others? If so, then they were in another rut, somewhere, and not even the tops of their heads showed. He and his kind could recognize each other only by an elaborate process of elimination; they had to watch for the people no one noticed.

He opened the door for the clerk, saw the road, and found his thoughts back with the highway.

The highway would run from Hollister, which was a railroad junction, to the Air Force Base at Farnham, where his calculations in sociomathematics had long ago predicted the first starship would be constructed and launched. The trucks would rumble up the highway, feeding the open maw with men and material.

He cleaned his lips. Up there in space, somewhere; somewhere outside the Solar System, was another race. The imprint of their visits here was plain. The humans would encounter them, and again he could predict the result; the humans would win.

Gus Kusevic could not go along to investigate the challenges that he doubted lay among the stars. Even with scrapbooks full of notices and clippings, he had barely made his career penetrate the public consciousness. Halsey, who had exuberantly broken every baseball record in the books, was known as a "pretty fair country pitcher."

What credentials could he present with his application to the Air Force? Who would remember them the next day if he had any? What would become of the records of his inoculations, his physical check-ups, his training courses? Who would remember to reserve a bunk for him, or stow supplies for him, or add his consumption to the total when the time came to allow for oxygen?

Stow away? Nothing easier. But, again; who would die so he could live within the tight lattice of shipboard economy? Which sheep would he slaughter, and to what useful purpose, in the last analysis?

"Well, so long," the clerk said.

"Good-by," Gus said.

The clerk walked down the flagstones and out to his flivver.

I think, Gus said to himself, it would have been much better for us if Evolution had been a little less protective and a little more thoughtful. An occasional pogrom wouldn't have done us any harm. A ghetto at least keeps the courtship problem solved.

Our seed has been spilt on the ground.

Suddenly, Gus ran forward, pushed by something he didn't care to name. He looked up through the flivver's open door, and the clerk looked down apprehensively.

"Danvers, you're a sports fan," Gus said hastily, realizing his voice

was too urgent; that he was startling the clerk with his intensity.

"That's right," the clerk answered, pushing himself nervously back along the seat.

"Who's heavyweight champion of the world?"

"Mike Frazier. Why?"

"Who'd he beat for the title? Who used to be champion?"

The clerk pursed his lips. "Huh! It's been years— Gee, I don't know. I don't remember. I could look it up, I guess."

Gus exhaled slowly. He half-turned and looked back toward the cottage, the lawn, the flower beds, the walk, the arbor, and the fish pond under the willow tree. "Never mind," he said, and walked back into the house while the clerk wobbled his flivver into the air.

The TV set was blaring with sound. He checked the status of the game.

It had gone quickly. Halsey had pitched a one-hitter so far, and the Giants' pitcher had done almost as well. The score was tied at 1-1, the Giants were at bat, and it was the last out in the ninth inning. The camera boomed in on Halsey's face.

Halsey looked at the batter with complete disinterest in his eyes, wound up, and threw the home-run ball.

THE END

IN TIMES TO COME

It's been quite a while since we had a novelette by Murray Leinster; next issue starts off with his yarn, "Sand Doom." It's got an angle—several in fact—that hasn't been considered adequately in science fiction; the problem of racial differences. Authors have been blithely labeling planets "habitable, Terra-type" and letting it go at that.

Hm-m-m . . . but Peruvian Indians can work happily at 15,000-foot altitudes, where the people of the rest of the world die off like flies. No low-altitude race can reproduce at that altitude; the women die. No Caucasian colony could maintain itself in a climate like that of the Gold Coast of Africa; barely staying alive is all the Caucasian can achieve. Reproduction is a lethal load. But the Negro race has evolved a resistance to that violent climate that allows them to thrive.

So . . . what's a "habitable, Terra-type" world? Habitable . . . for whom?

THE EDITOR.

CUBS OF THE WOLF

BY RAYMOND F. JONES

It may be that there is a weapon that, from the viewpoint of the one it's used on, is worse than lethal. You might say that death multiplies you by zero; what would multiplication by minus one do?

Illustrated by Rogers

In the spring the cherry blossoms are heavy in the air over the campus of Solarian Institute of Science and Humanities. On a small slope that rims the park area, Cameron Wilder lay on his back squinting through the cloud of pink-white petals to the sky beyond. Beside him, Joyce Farquhar drew her jacket closer with an irritated gesture. It was still too cold to be sitting on the grass, but Cameron didn't seem to notice it—or anything else, Joyce thought.

"If you don't submit a subject for your thesis now," she said, "you'll take another full six months getting your doctorate. Sometimes I think you don't really want it!"

Cameron stirred. He shifted his squinting gaze from the sky to Joyce and finally sat up. But he was staring ahead through the trees again as he took his pipe from his pocket and began filling it slowly.

"I *don't* want it if it's not going to mean anything after I get it," he

said belligerently. "I'm not going to do an investigation of some silly subject like The Transience of Venusian Immigrants in Relation to the Martian Polar Ice Cap Cycle. Solarian sociologists are the butt of enough ridicule now. Do something like that and for the rest of your life you get knocking of the knees whenever anybody inquires about the specialty you worked in and threatens to read your thesis."

"Nobody's asking you to do anything you don't want to. But *you* picked the field of sociology to work in. Now I don't see why you have to act such a purist that it takes months to find a research project for your degree. Pick something—anything!—I don't care what it is. But if you don't get a degree and an appointment out of the next session I don't think we'll ever get married —not ever."

Cameron removed his pipe from his mouth with a precise grip and considered it intently as it cupped in his hands. "I'm glad you mentioned marriage," he said. "I was just about to speak of it myself."

"Well, don't!" said Joyce. "After three years—Three years!"

He turned to face her and smiled for the first time. He liked to lead her along occasionally just to watch her explode, but he was not always sure when he had gone too far. Joyce had a mind like a snapping, random matching calculator while he operated more on a slow, carefully shaping analogue basis, knowing things were never quite what they seemed but trying to get as close an approximation of the true picture as possible.

"Will you marry me now?" he said.

The question did not seem to startle her. "No degree, no appointment—and no chance of getting one—we couldn't even get a license. I hope you aren't suggesting we try to get along without one, or on a forgery!"

Cameron shook his head. "No, darling, this is a perfectly bona fide proposal, complete with license, appointment, the works—what do you say?"

"I say this spring sun is too much for you." She touched the dark mass of his hair, warmed by the sun's rays, and put her head on his shoulder. She started to cry. "Don't tease me like that, Cameron. It seems like we've been waiting forever—and there's still forever ahead of us. You can't do anything you want to—"

Cameron put his arms about her, not caring if the whole Institute faculty leaned out the windows to watch. "That's why you should appreciate being about to marry such a resourceful fellow," he said more gently. And now he dropped all banter. "I've been thinking about how long it's been, too. That's why I decided to try to kill a couple of sparrows with one pebble."

Joyce sat up. "You aren't serious—?"

Cameron sucked on his pipe once more. "Ever hear of the Markovian Nucleus?" he said thoughtfully.

Joyce slowly nodded her head. "Oh, I think I've heard the name

mentioned," she murmured, "but nothing more than that."

"I've asked for that as my research project."

"But that's clear out of the galaxy —in Transpace!"

"Yes, and obviously out of bounds for the ordinary graduate researcher. But because of the scholarship record I've been able to rack up here I took a chance on applying to the Corning Foundation for a grant. And they decided to take a chance on me after considerable and not entirely painless investigation. That's why you were followed around like a suspected Disloyalist for a month. My application included a provision for you to go along as my wife. Professor Fothergill notified me this morning that the grant had been awarded."

"Cam—" Joyce's voice was brittle now. "You aren't fooling me?"

He gathered her in his arms again. "You think I would fool about something like that, darling? In a week you'll be Mrs. C. Wilder, and as soon as school is out, on your way to the Markovian Nucleus. And besides, it took me almost as much work preparing the research prospectus as the average guy spends on his whole project!"

Sometimes Joyce Farquhar wished Cameron were a good deal different than he was. But then he wouldn't have been Cameron, and she wouldn't want to marry him, she supposed. And somehow, while he fell behind on the mid-stretch, he always managed to come in at the end with the rest of the field. Or just a little bit ahead of it.

Or a good deal ahead of it. As now. It took her a few moments to realize the magnitude of the coup he had actually pulled off. For weeks she had been depressed because he refused to use some trivial, breeze research to get his degree. He could have started it as much as a year ago, and they could have been married now if he'd set himself up a real cinch.

But now they were getting married anyway—and Cameron was getting the kind of research deal that would satisfy his frantic desire for integrity in a world where it counted for little, and his wish to contribute something genuine to the sociological understanding of sentient creatures.

Their marriage, as was customary, would be a cut and dried affair. A call to the license bureau, receipt of formal sanction in the mail—she supposed Cameron had already made application—and a little party with a few of their closest friends on the campus. She wished she had lived in the days when getting married was much easier to do, and something to make a fuss about.

She stirred and sat up, loosening the jacket as the sun came from behind a puff of cloud. "You could have told me about this a long time ago, couldn't you?" she said accusingly.

Cameron nodded. "I could have. But I didn't want to get false hopes aroused. I didn't have much hope the deal would actually go through,

myself. I think Fothergill is pretty much responsible for it."

"Transpace—" Joyce said dreamily. "Tell me about the Markovian Nucleus. Why is it important enough for a big research study, anyway?"

"It's a case of a leopard who changed his spots," said Cameron. "And nobody knows how or why. The full title of the project is A Study of the Metamorphosis of the Markovian Nucleus."

"What happened? How are they any different from the way they used to be?"

"A hundred and fifty years ago the Markovians were the meanest, nastiest, orneriest specimens in the entire Council of Galactic Associates. The groups of worlds in one corner of their galaxy, which make up the Nucleus, controlled a military force that outweighed anything the Council could possibly bring to bear against them.

"With complete disregard of any scheme of interplanetary rules or order they harassed and attacked peaceful shipping and inoffensive cultures throughout a wide territory. They were something demanding the Council's military action. But the Council lacked the strength.

"For years the Council dragged on, debating and threatening ineffectively. But nothing was ever done. And then, so gradually it was hardly noticed, the harassments began to die down. The warlike posturing was abandoned by the Markovians. Within a period of about seventy or eighty years there was a complete about-face. They wound up as good Indians, peaceful, coöperative and intelligent members of the Council."

"Didn't anybody ever find out why?" asked Joyce.

"No. Nobody *wanted* to find out. In the early years the worlds of the Council were hiding behind their collective hands hoping with all their might that the threat might go away if they kept their eyes closed long enough. And by some miracle of all miracles, when they parted their fingers for a scared glimpse, the threat *had* disappeared.

"When they could breathe a little more easily it seemed a foolish thing to bring out this old skeleton from the closet again, so a perpetual state of hush was established. Finally, the whole thing was practically forgotten except for a short paragraph in an occasional history text. But no politician or historian has ever dared publicly to question the mysterious why of the Markovian's about-face."

"Sociologists should have done it long ago," said Joyce.

"There was always the political pressure, of course," said Cameron. "But the real reason was simply our preoccupation with making bibliographies of each others' papers. It's going to take a lot of leg work, something in which our formal courses don't give us any basic training. Fothergill understands that—it's why he pushed me so hard with the Foundation. And Riley up there is capable of seeing it, too.

"I showed him that here was a complex of at least a hundred and

ten major planets, inhabited by a fairly homogenous, civilized people, speaking from a technological point of view at least. And almost overnight some force changed the entire cultural posture. I made him see that identification of that force is of no small interest to us right now. If it operated once, it could operate again —and would its results be as happy a second time?

"Riley got the Foundation to kick through enough for you and me to make a start. A preliminary survey is about all it will amount to, actually, but if we show evidence of something tangible I'll get my degree, you'll get your basic certification—and we'll both return in charge of a full-scale inquiry with a staff big enough to really dig into things next year.

"Now—about this matter of marriage which you didn't want me to speak of—"

"Keep talking, Cam—you're doing wonderfully!"

They got married at once, even though there were several weeks of school which had to be finished before they could leave. Among their friends on the campus there were a good many whispered remarks about the insanity of Joyce and Cameron in planning such a fantastic excursion, but Joyce was certain there was as much envy as criticism in the eyes of her associates. It might be true when they asserted that every conceivable sociological factor or combination of factors could be found and analyzed right here in the Solar System, but a husband who could finagle a way to combine a honeymoon trip halfway across space with his graduate research thesis was a rare specimen. Joyce played her advantage for all it was worth.

Two weeks before departure time, however, Cameron was called to the office of Professor Fothergill. As he entered he found a third man present, wearing a uniform he recognized at once as belonging to the Council Secretariat.

"I'll wait outside," he said abruptly as Fothergill turned. "I got your message and came right over. I didn't know—"

"Sit down," said Fothergill. "Cameron, this is Mr. Ebbing, whose position you no doubt recognize. Mr. Ebbing, Mr. Wilder."

The men shook hands and took seats across from each other. Fothergill sat between them at the polished table. "The Council, it seems, has developed an interest in your proposed research among the Markovians," he said. "I'll let Mr. Ebbing tell you about it."

Cameron felt a sinking anticipation within him as he turned to the secretary. Surely the Council wasn't going to actively oppose the investigation after so long a time!

The secretary coughed and shuffled the papers he drew from his case. "It's not actually the Council's interest," he said, and Cameron was immediately relieved. "But I have been asked by the Markovian Nucleus, through their representative, to suggest that they would like to save you

the long and unnecessary trip. He offers to co-operate to the fullest degree by causing all necessary materials to be transferred to your site of study right here. He feels that this is the least they can do since so much interest appears to exist in the Nucleus."

Cameron stared at the secretary, trying to discern what the man's own attitude might be, but Ebbing gave no sign of playing it any way but straight.

"It sounds like a polite invitation to stay home and mind our own business," said Cameron finally. "They don't want company."

The secretary's expression changed to acknowledgment of the correct appraisal. "They don't want any investigation into the Metamorphosis of the Markovian Nucleus. There is no such thing. It is entirely a myth."

"Says the Markovians—!"

Ebbing nodded. "Says the Markovians. Other worlds, both within and without the Council have persisted in spreading tales and rumors about the Markovians for a long time. They don't like it. They are willing to cooperate in having a correct analysis of their culture published, but they don't want any more of these infamous rumors circulated."

"Then why aren't they willing to promote such an investigation? This would be their big chance—if their ridiculous position were true!"

"They *are* willing. I've told you the representative has offered to send you all needed material showing the status of their culture."

Cameron looked at the secretary for a long time before speaking again. "What's your position?" he asked finally. "Are we being ordered off the investigation?"

"The Markovian representative doesn't want to go to quite that extreme. He knows that, too, would react unfavorably towards his people. Here's his point: So far, he's blocked news of your proposed research getting to his home worlds. But he knows that if you do carry it out in the manner you propose it is going to make a lot of the home folks mighty unhappy and they'll demand to know why he didn't stop it. So he's trying to satisfy both sides at once."

"Why will the people in the Nucleus be made unhappy by our coming?"

"Because you'll go there trying to track down the basis for the rumors that defame the Markovian character. You'll bring forcibly to their attention the fact that the rest of the Universe believes the Markovians are basically a bunch of pirates."

"And the Markovians don't like to hear these things?"

"Definitely not."

"So you tell me the research is not being forbidden, but that the Markovians won't like it. Suppose I tell you, then, I'm not going to give up short of an order from the Council itself. But I am willing to camouflage the investigation if necessary. I'll make no open mention of what outside opinion says of the Markovians. I'll simply make a study of their history

and character as it becomes available to me."

Ebbing nodded slowly, his eyes fixed on Cameron's face. "I would say that would be eminently satisfactory," he said. "I will inform the representative of your decision."

Then his face became more severe. "The Council will be pleased to learn of your willingness to be discreet. I wonder if you understand that the Foundation came to us upon receipt of your application, for official clearance of the project. It coincided quite fortuitously with the plans of the Council itself. For a long time we have been concerned with the lack of information regarding the Markovian situation and have been at a loss as to how to improve our situation.

"Your proposed investigation seemed the answer, but we anticipated the Markovian objection and had to make certain you would cooperate to his satisfaction. I believe this will do it."

"Why is the Council concerned?" said Cameron. "Have the Markovians changed their attitude in any way?"

"No—but the rest of us remember, even though we don't speak of it, that the Nucleus was never punished for its depredations, nor was it ever defeated. Its strength is as great as ever in proportion to the other Council worlds.

"What are the chances and potentialities of the Nucleus worlds ever again becoming the marauders they once were? That is the question which we feel must be answered. Without knowing, we are sitting on a powder keg in which the fuse may or may not be lighted. Will you bring us back the answer we need?"

Cameron felt a sudden grimness which had not been present before. "I'll do all I can," he said soberly. "If the information is there I'll bring it back."

After the secretary had gone and Fothergill turned from the door to rejoin him Cameron sat in faintly shocked consideration of the Council's unexpected support. It took his research out of the realm of the purely sociological and projected it into politics and diplomacy. He was pleased by their confidence, but not cheered by the added responsibility.

"That's a lucky break," said Fothergill enthusiastically, "and I'm beginning to suspect you may be rather badly in need of all the breaks you can get once you land among the Markovians. Don't forget for a single minute that you are dealing with the sons and grandsons of genuine pirates."

The professor sat down again. "There's one other little item of interest I turned up the other day. You should know about it before you leave. The Markovian Nucleus is somewhat of a hotbed of Ids."

"Ids—you mean the Idealists—?"

Fothergill nodded. "Know anything about them?"

"Not much, except that they are a sort of parasitic group, living usually in a servant relationship to other races on terran-type worlds. As I recall, even they claim that they do

not know the planet or even the galaxy of their origin, because they have been wanderers for so many generations among alien races. Perhaps it would be a good idea to make a study of them, too—I don't know that a thorough one has ever been made."

"That's what I wanted to warn you about," said Fothergill, smiling. "Stick to one subject at a time. The Ids *would* make a nice research project in themselves, and maybe you can get around to it eventually. But leave them alone for the present and don't become distracted from your basic project among the Markovians. The policy of the Corning Foundation is to demand something very definite in return for the money they lay on the line. You won't get to go back next year unless you produce. That's why I don't want you to get sidetracked in any way."

II

Cameron admitted to himself that he was getting more edgy as the day of departure approached, but he tried to keep Joyce from seeing it. He was worried about the possible development of further opposition now that the Markovian had expressed his displeasure, and he was worried about their reception once they reached the Nucleus. He wondered why they had not seen in advance that it would be an obvious blunder to let the Markovians be aware of their real purpose. It didn't even require a pirate ancestry to make groups unappreciative about resurrection of their family skeletons.

But no other hindrance appeared, and on the evening before their departure Fothergill called that word had been received from Ebbing stating the Markovian representative had approved the visit now that Cameron had expressed a change in his objectives. Their coming had been announced to the Markovian people and the way prepared for an official welcome.

Cameron was pleased by the change of attitude. He was hit for the first time, however, by the full force of the fact that he was taking his bride to a pirate center which the Council had never overthrown and which was active only moments ago, culturally speaking.

If any kind of trouble should develop the Council would be almost impotent in offering them assistance. On the face of it, there was no reason to expect trouble. But the peculiarly oblique opposition of the Markovian delegate in the Council continued to make him uneasy.

His tentative suggestion that he would feel better if he knew she were safe on Earth brought a blistering response from Joyce, which left him with no doubts about carrying out his original plans.

And then, as the last of their packing was completed and they were ready to call it a day, the phone buzzed. Cameron hesitated, determined to let it go unanswered, then punched the button irritably on audio only.

Instead of the caller, he heard the voice of the operator. "One moment please. Interstellar, Transpace, printed. Please connect visio."

It was like a shock, he thought afterwards. There was no one he knew who could be making such a call to him. But automatically he did as directed. Joyce had come up and was peering over his shoulder now. The screen fluttered for a moment with polychrome colors and cleared. The message, printed for English translation, stood out sharply. Joyce and Cameron exclaimed simultaneously at the titling. It was from Premier Jargla, Executive Head of the Markovian Government.

"To Wilder, Cameron and Joyce," it read, "greetings and appreciation for your proposed visit to the Markovian Nucleus for study of our history and customs. We have not been before so honored. We feel, however, that it is an imposition on your Foundation and on you personally to require that you make the long journey to the Nucleus for this purpose alone. While we would be honored to entertain you—"

It was the same proposition as Ebbing had reported the delegate offered. Only this time it was from the head of the Markovian government himself.

They sat up nearly all the rest of the night considering this new development. "Maybe you shouldn't go, after all," said Joyce once. "Maybe this is something that needs bigger handling than we can possibly give it."

Cameron shook his head. "*I've* got to go. They haven't closed the door and said we can't come. If I backed out before they did, I'd be known the rest of my life as the guy who was *going* to crack the Markovian problem. But I'd much rather you—"

"No! If you're going, so am I."

They consulted again with Fothergill and finally drafted as polite a reply as possible, explaining they were newly married, desired to make the trip a honeymoon excursion primarily and conduct an investigation into Markovian culture to prevent the waste of the wonderful opportunity their visit would afford them.

An hour before takeoff a polite acknowledgment came back from the Nucleus assuring them a warm welcome and congratulating them on their marriage. They went at once to the spaceport and took over their stateroom. "Before anything else happens to try to pull us off this investigation," Cameron said.

The trip would be a long one, involving more than two months subjective time, because no express runs moved any distance at all in the direction of the Nucleus. It was necessary to transfer three times, with days of waiting between ships on planets whose surface conditions permitted exploration only in cumbersome suits that could not be worn for more than short periods. Most of the waiting time was spent in the visitors' chambers at the landing fields.

These seemed to grow progressive-

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ly worse. The last one could not maintain a gravity below 2G, and the minimum temperature available was 104 degrees. There was a three-day wait here and Joyce spent most of it lying on the bed, under the breeze of a fan which seemed to have required a special dispensation of the governing body to obtain.

Cameron, however, was unwilling to spend his time this way in spite of the discomfort imposed by any kind of activity. Humidity was a physical factor which seemed to have gone undiscovered by the inhabitants of the planet they were on. He was sure it was constantly maintained within a fractional per cent of one hundred as he donned a clean pair of trunks and staggered miserably along the corridor toward a window that gave a limited view of the city about them.

That was when he discovered that they were to be accompanied on the remainder of the journey by a Markovian citizen and his Id servant.

The visitors' chamber in which these semi-terran conditions were supplied consisted of only three suites. The other two had been empty when Cameron and Joyce arrived the night before. Now a Markovian Id occupied a seat by the window. He glanced up with warm friendliness and invited Cameron to join him.

Cameron hesitated, undecided for a moment whether to return to his suite for the portable semantic translator used in his profession at times like this. He always felt there was

something decidedly unprofessional about resorting to their use and had spent many hours trying to master Markovian before leaving. He understood the Id well enough and decided to see if he could get along without the translator.

"Thanks," he said, taking a seat. "I don't suppose there's much else to do except look at the scenery here."

The Id showed obvious surprise that Cameron spoke the language without use of an instrument. His look of pleasure increased. "It is not often we find one of your race who has taken the trouble to make himself communicable with us. You must be expecting to make a long stay?"

Cameron's sense of caution returned as he remembered the previous results of indiscreet announcement of his purpose. He wiped the stream of sweat from his face and neck and took a good look at the Id.

The Idealists were of an anthropomorphic race, dark-skinned like the terran Indian. Very few of them had ever appeared on Earth, however, and this was actually Cameron's first view of one in the flesh. He knew something of their reputation and characteristics from very brief study at the Institute—but no one really knew very much of the Ids as far as Earthmen were concerned. The warning of Fothergill to keep to the main line of his research sank to the bottom of his mind as he leaned toward the stranger with a fresh sense of excitement inside him.

"I have never felt you could understand another man unless you spoke his language," he said in his not too stumbling Markovian.

The Id, like himself, was dressed in the briefest of garments and perspiration poured from the dark skin as he nodded. "You speak sounder wisdom than one usually meets in a stranger," he said. "May I introduce myself: Sal Karone, servant of the Master Dalls Ret Marthasa?"

Cameron introduced himself and cautiously explained that he and Joyce were on their honeymoon, but had a side interest in the history and customs of the Markovian Nucleus. "My people know so little about you," he said, "it would be a great privilege to be able to take back information that would increase our mutual understanding."

"All that the Idealists have belongs to every man and every race," said Sal Karone solemnly. "What we can give you may be had for the asking. But I would give you a word of warning about my Masters."

Cameron felt the flesh of his back tingle with sudden chill as the eyes of the Id turned full upon him.

"Do not try to find out the hidden things of the Masters. That is what you have come for, is it not, Cameron Wilder? That is why you have taken so much trouble to learn the language which we speak. I say do not inquire of the things about which they do not wish to speak. My Masters are a people who cannot yet be understood by the men of other worlds. In time there will be under-

standing, but that time is not yet. You will only bring disaster and disappointment upon us and yourselves by attempting to hasten that time."

"I assure you I have no intention of prying," said Cameron haltingly. He fumbled for the right Markovian words. "You have misunderstood—We come only in friendship and with no intention of disturbing—"

The Id nodded sagely. "So many crises are originated by good intentions. But I am sure that now you understand the feelings of my Masters in these things that you will be concerned only with your own enjoyment while in the Nucleus. And do come to the centers of the Idealists, for there is much we can show you, and our willingness has no limits."

For a moment it was impossible for Cameron to remember that he was dealing with a mere servant of the Markovians. The Id's words were so incisive and his manner so commanding that it seemed he must be speaking in his own right.

And then his manner changed. His boldness vanished and he spoke obsequiously. "You will forgive me," he said, "but this is a matter concerning which there is much feeling."

Cameron Wilder was more than willing to agree with this sentiment. As he returned to his own quarters he debated telling Joyce of his encounter with the Id, deciding finally that he'd have to mention it since they'd all be traveling together, but omitting the Id's repetition of the previous warnings.

He did not meet the Markovian, nor did he encounter the Id again in the waiting quarters. It was not until they had embarked on the last leg of the journey and had been aboard the vessel for half a day that they met a second time.

The ship was not a Markovian or a terran-type vessel of any kind. Another week's wait would have been required for one of those. As it was, their quarters were not too uncomfortable although very limited. The bulk of the vessel was designed for crew and passengers very much unlike Terran or Markovian, and only a few suites were provided for accommodation of such races.

This threw the travelers to the Nucleus in close association again. Their suites opened to a common lounge deck and when Cameron and Joyce went out they found Sal Karone and the Markovian, Marthasa, already there.

The Id was on his feet instantly. With a sharp bow he introduced the newcomers to his Master. Dells Marthasa stood and extended a hand with a smile. "I believe that is your greeting on Earth, is it not?" he said.

"You must be familiar with our home world," said Cameron, returning the handshake.

"Only a little, through my studies," said the Markovian. "Enough to make me want to hear much more. Please join us. Since my *sargh* told me we would be traveling together I have looked forward to your company."

The term, *sargh,* as Cameron

learned shortly was applied to all Ids attached to Markovians. It had a connotation somewhere between servant and companion. Sal Karone remained in the background, but there was no servility in his manner. His eyes remained respectfully—almost fondly; that was the right word, Cameron thought curiously—on Marthasa.

While the Id was slender in build, the Markovian was taller and bulkier. His complexion was also dark, but not quite so much so as the Id's. He was dressed in loose, highly colored attire that gave Cameron an impression of an Oriental potentate of his own world.

But somehow there was a quality in Marthasa's manner that was jarring. It would have been less so if the Markovian had been less anthropomorphic in form and feature, but Cameron found it difficult to think of him as anything but a fellow man.

A man of arrogance and ill manners, and completely unaware that he was so.

It was apparent in his gestures and in the negligence with which he leaned back and surveyed his companions. "You'll be surprised when you see the Nucleus," he said. "We sometimes hear of rumors circulated among Council worlds that Markovian culture is rather backward."

"I've never heard anything of that kind," said Cameron. "In fact we've heard almost nothing at all of the Nucleus. That's why we decided to come."

"I'm sure we can make you glad you did. Don't you think so, Karone?"

The face of the Id was very sober as he nodded solemnly and said, "Indeed, Master." His burning eyes were boring directly into Cameron's own.

"I want to hear about your people, about Earth," said Marthasa. "Tell me what you would like to see and do while you're in the Nucleus."

While Joyce answered, explaining they hardly knew what there was to be seen, Cameron's attention was fixed by the problem of the strange relationship between the two men—the two races. In the face of the Id there seemed a serenity, a dignity that the Markovian would never know. Why had the Ids failed to lift themselves out of servility to a state of independence, he wondered?

Joyce explained the story about their honeymoon trip and built their interest in Markovian culture as casual indeed. As she went on, Marthasa seemed to be struck by a sudden thought.

"I insist that you make your headquarters with me during your stay," he said. "I can see that you learn everything possible about the Nucleus while you are here. My son is a Chief Historian at our largest research library and my daughter has the post of Assistant Curator at our Museum of Science and Culture. You will never have a better opportunity to examine the culture of the Nucleus!"

Cameron winced inwardly at the thought of Marthasa's companion-

ship during their whole stay, and yet the Markovian's statement might be perfectly true—there would be no better opportunity to make their study.

"We have an official note of welcome from your Executive Head, Premier Jargla," he said. "While we would be very happy to accept your invitation, it may be that he has different plans for our reception."

Marthasa waved a hand. "I shall arrange for my appointment as your official host. Consider it agreed upon!"

It was agreed. But Joyce was not as optimistic as Cameron in regarding it an aid to their study. "If they have a general aversion to talking about their pirate ancestry, Marthasa is just the boy to put us off the track," she said. "If he gets a clue to what we really want to know, he'll keep us busy looking at everything else until we give up and go home."

Cameron leaned back in the deep chair with his hands behind his head. "It's not too hard to imagine Marthasa's great-great-grandfather running down vessels in space and pillaging helpless cities on other planets. The veneer of civilization on him doesn't look very thick."

"It's not hard to imagine Marthasa doing it," said Joyce. "A scimitar between his teeth would be completely in character!"

"If all goes well, you will probably see just that—figuratively speaking, of course. Where a cultural shift has been so great as this one you are certain to see evidence of both levels in conflict with one another. It's like a geologic fault line. Once we learn enough about the current mores the anomolies will stand out in full view. That's what we want to watch for."

"One thing that's out of character right now is his offer of assistance through his son, the Chief Historian," said Joyce. "That doesn't check with the previous invitations to stay home. Once they let us have access to their historical records we'll have them pegged."

"We haven't got it yet," said Cameron. "We can't be sure just what they'll let us see. But for my money I'd just as soon tackle the question of the Ids. Sal Karone is twice the man Marthasa is, yet he acts like he has no will of his own when the Markovian is around."

"The Roman-slave relationship," said Joyce. "The Markovians probably conquered a large community of the Ids in their pirate days and brought them here as slaves. And I'll bet they are very much aware that the Ids are the better men. Marthasa knows it. That's why he has to put on a show in front of Sal Karone. He's the old Roman merchant struggling to keep up his conviction of superiority before the Greek scholar slave."

"The Ids aren't supposed to be slaves. According to the little that's known they are completely free. I'm going to get Marthasa's version of it, anyway. Fothergill and the Foundation can't object to that much investigation of the Ids."

He found the Markovian completely willing to talk about his *sargh*. On the last day of the voyage they managed to be alone for a time without the presence of Sal Karone.

Marthasa shook his head in answer to Cameron's question. "No, the *sargh* is not a slave—not in the sense I believe you mean it. None of the Ids are. It's a matter of religion with them to be attached to us the way they are. They have some incomprehensible belief that their existence is of no value unless they are serving their fellow beings. Since that means *all* of them they can't be satisfied by serving each other so they have to pick on some other race.

"I don't recall when they first showed up in the Nucleus, but it's been many generations ago. There've been Ids in my family for a half dozen generations anyway."

"They had space flight, so they came under their own power?" Cameron asked incredulously.

"No. Nothing like that. You can't imagine *them* building spaceships can you? They migrated at first as lowest-class passengers on the commercial lines. Nobody knows just where they came from. They don't even know their home worlds. At first we tried to persuade them to go somewhere else, but then we saw how useful they could be with their fanatic belief in servitude.

"At present there is probably no family in the Nucleus that doesn't have at least one Id *sargh*. Many of us have one for every member of the family." Marthasa paused. The tone of his voice changed. "When you've had one almost all your life as I've had Sal Karone it—well, it does something to you."

"What do you mean?" Cameron asked cautiously.

"Consider the situation from Sal Karone's point of view. He has no life whatever that is his own. His whole purpose is to give me companionship and satisfy my requirements. And I don't have to force him in any way. It's all voluntary. He's free to leave, even, any time he wants to. But I'm certain he never will."

"Why do you feel so sure of this?"

"It's hard to explain. I feel as if I've become so much a part of him that he couldn't survive alone any more. He's the one who's made it that way, not me. I have become indispensable to his existence. That's the way I explain it to myself. Most of my friends agree that this is about right."

"It's rather difficult to understand a relationship like that—unless you put it in terms I am familiar with on Earth."

"Yes—? What would it be called among your people?"

"When a man so devotes his life to another we say it is because of love."

Marthasa considered the word. "You would be wrong," he said. "It is just that in some way we have become indispensable to the Ids. They're parasites, if you want to put it that way. But they provide us a

relationship we can get nowhere else, and that does us a great deal of good. That's what I meant when I said it does something to us."

"What about the Id's own culture? Haven't they any community ties among themselves, or do they ignore their own kind?"

"We've never investigated very much. I suppose some of our scholars know the answer to that, but the rest of us don't. The Ids have communities, all right. Not all of them are in service as *sarghs* at one time. They have little groups and communities on the outskirts of our cities, but they don't amount to much. As a race they are simply inferior. They don't have the capacity for a strong culture of their own, so they can't exist independently and build a social structure like other people. It's this religion of theirs that does it. They won't let go of it, and as long as they hang onto it they can't stand on their own feet. But you don't need to feel sorry for them. We treat them all right."

"Of course— didn't mean to imply anything else," said Cameron. "Do you know if there are other Id groups serving in other galaxies?"

"Must be thousands of them altogether. Out beyond the Nucleus, away from your galaxy, you can't find a planet anywhere that isn't using the Ids. It's a wonderful setup. The Ids get what they want, and we get *sarghs* with nothing like the slave relationship you had in mind. With slaves there's rebellion, constant need of watchfulness, and no genuine companionship. A *sargh* is different. He can be a man's friend."

III

They came out of the darkness of Transpace that evening and the stars returned in the glory of a million closely gathered suns. The Markovian Nucleus lay in a galaxy of tightly packed stars that made bright the nights of all their planets. It was a spectacle for Cameron, who had traveled but little away from the Solar System, and for Joyce who had never traveled at all.

Marthasa and Sal Karone were with them in the lounge watching the screens as the ship changed drives. The Markovian squinted a moment and pointed to a minor dot near the corner of the view. "That's our destination. Another six hours and you can set foot on the best planet in the whole Universe!"

If it had been mere enthusiasm, Cameron could have taken it with tolerant understanding. But Marthasa's smugness and arrogance had not deserted him once since the beginning of this leg of the trip. Objectively, as a cultural facet to be examined, it was interesting, but Cameron agreed with Joyce that it was going to be difficult to live with.

The unsolved puzzle, however, was Sal Karone. It was obvious that the Id was sensitive to the gauche ways of the Master, yet his equally obvious devotion was unwavering.

Marthasa had sent word ahead to the government that he desired the

Terrans to be his guests. Evidently he was a person of influence for assent was returned immediately.

His planet was a colorful world, banded by huge, golden deserts and pinkish seas. The dense vegetation of the habitable areas was blue with only a scattered touch of green. Cameron wondered about the chemistry involved.

The landing was made at a port that bordered a sea. The four of them were the only ones disembarking, and before the car that met them had reached the edge of the city the ship was gone again.

A pirates' lair, Cameron thought, without the slightest touch of amusement. The field looked very old, and from it he could imagine raiders had once taken off to harass distant shipping and do wanton destruction of cities and peoples on innocent worlds.

He watched the face of Marthasa as they rode through the city. There was a kind of Roman splendor in what they saw, and there was a crude Roman pride in the Markovian who was their host. The arrogance, that was not far from cruelty, could take such pride in the sweep of spaceships embarking on missions of murder and plunder.

And yet all this barbarism had been put aside. Only the arrogance remained, expressed in Marthasa's tone as he called their attention to the features of the city and landscape through which they passed. It wasn't pleasing particularly to Terran tastes, but Cameron guessed that it represented a considerable accomplishment to the Markovians. Stone appeared to be the chief building material, and, while the craftsmanship was exact, the lines of the structures lacked the grace of the Greek and Roman monuments of which Cameron was reminded.

They came at last to the house of Marthasa. There was no doubt now that he was a man of wealth or importance—probably both. He occupied a vast, villalike structure set on a low hill overlooking the city. It was a place of obvious luxury in the economic scale of the Markovians.

They were assigned spacious quarters overlooking a garden of incredible colors beyond the transparent wall facing it. Sal Karone was also assigned duties as their personal attendant, which Cameron grasped intuitively was a gesture of supreme honor among the Markovians. He thanked Marthasa profusely for this courtesy.

After getting unpacked they were shown through the house and grounds and met Marthasa's family. His wife was a woman of considerable beauty even by Terran standards, but there was a sharpness in her manner and a sense of coldness in the small black eyes that repelled Cameron and Joyce even as the thoughtless actions of Marthasa had done.

Cameron looked carefully for the same qualities in the three smaller children who were at home, and found them easily. In none of them was there the aura of serenity possessed by the Id servants.

When they were finally alone that night Cameron sat down to make some notes on their observations up to date. "The fault line I mentioned is so obvious you can't miss it," he said to Joyce. "It's as if they're living one kind of life because they think it's the thing to do, but all their thoughts and feelings are being drawn invisibly in another direction —and they're half ashamed of it."

"Maybe the Ids have something to do with it. Remember Marthasa's statement that the relationship of the *sarghs* does something to the Markovians? If we found out exactly what that something is, we might have the answer."

Cameron shook his head. "I've tried to fit it together that way, too, but it just doesn't add up. The basic premise of the Ids is asceticism and there never was any strength in that idea. Marthasa is probably right in his estimate of the Ids. They have achieved an internal serenity but only through compensating their basic weakness with the crude strength of the Markovians and other races to which they cling. They haven't the strength to build a civilization of their own. Certainly they haven't got the power to influence the whole Nucleus. No—we'll have to look a good deal farther than the Ids before we find the answer. I'm convinced of that, even though I'd like to find out exactly what makes *them* tick. Maybe next trip—"

The following days were spent in almost profitless activity as far as their basic purpose in being in the Nucleus was concerned. Marthasa and his wife took them on long tours through the city and into the scenic areas of the continent. They promised trips over the whole planet and to other worlds of the Nucleus. There seemed no end to the sight-seeing that was proposed for them to do.

Cameron improved his facility with the language, and Joyce was beginning to get along without the translator. They were introduced to a considerable number of other Markovians, including the official representative of Premier Jargla. This gave them added contact with the Markovian character, but Marthasa and his family seemed so typical of the race that scarcely anything new was learned from the others.

At no time was anything hinted in reference to the original reluctance to have the Terrans visit the Nucleus. All possible courtesy was shown them now, and Cameron dared not mention the invitations to stay home. He felt the situation was as penetrable as a thick wall of sponge rubber backed by a ten-foot foundation of steel.

After three weeks of this, however, he cautiously broached the subject of meeting the son and daughter of Marthasa in regard to visiting the library and museum. He had met each of them just once and found them rather cool to his presence. He had not dared express his interest in their specialties at that time.

Marthasa was favorable and apologetic, however. "I have intended to

arrange it," he said. "There have been so many other things to do that I have neglected your interest in these things. We won't neglect it any longer. Suppose we make an appointment for this afternoon? Zlenon will be able to give you his personal attention."

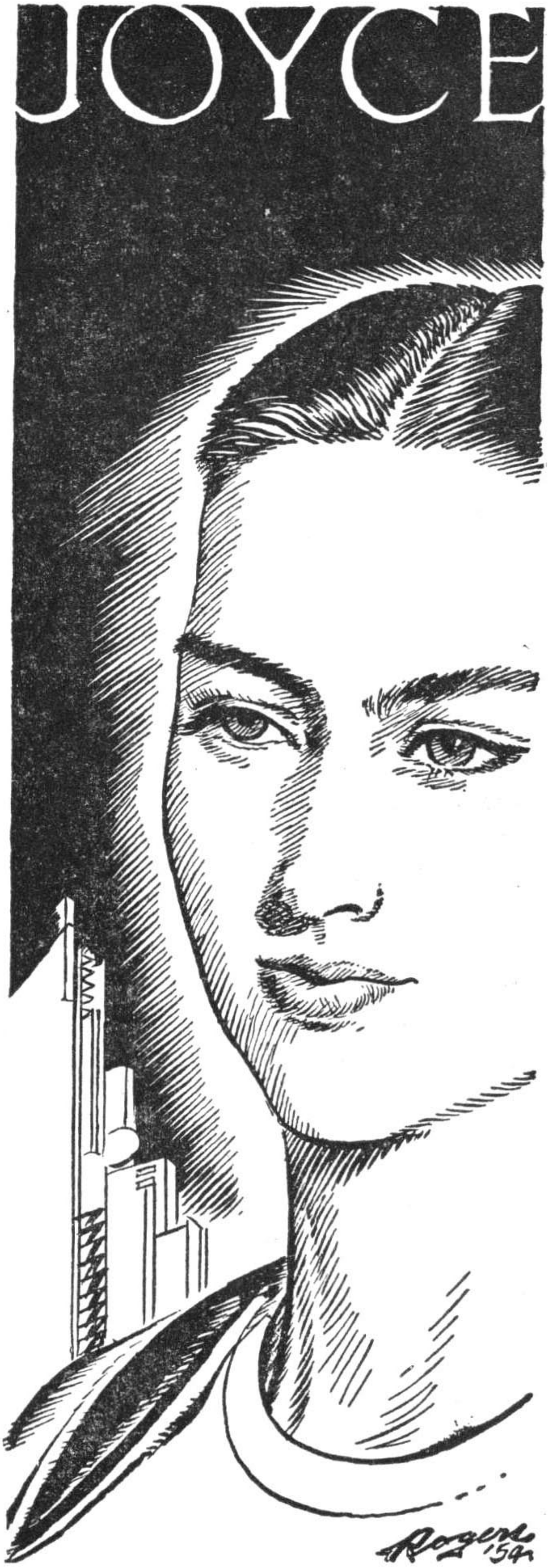
Zlenon was Marthasa's son, who held the position of Chief Historian at the research library. He was more slender and darker than his father, and lacking in his volubility and glad-handedness.

He greeted Cameron's request with a tolerant smile. "You have to be quite specific, Mr. Wilder, when you say you would like to know about the history of the Markovian Nucleus. You understand the Nucleus consists of over a hundred worlds and has a composite history extending back more than thirty thousand of your years in very minute detail."

Cameron countered with a helpless shrug and smile. "I'm afraid I'll have to depend on your good nature to guide me through such a mass. I don't intend to become a student of Markovian history, of course, but perhaps you have adequate summaries with which a stranger could start. Going backward, let us say, for perhaps two or three hundred Terran years?"

"Of course—some very excellent ones are available—" He moved toward the reading table nearby and began punching a selection of buttons.

As Cameron and Joyce moved to follow, Marthasa waved a hand ex-



pansively and started out the other way. "I can see you're going to be set for a while. I'll just leave you here, and send the car back after I reach the house. Don't be late for dinner."

They nodded and smiled and turned to Zlenon. The Markovian was watching them with pin-point eyes. "I wondered if there was any *particular* problem in which you might be interested," he said calmly. "If there is—"

Cameron shook his head hastily. "No—certainly not. Just general information—"

The Historian turned his attention to the table and began explaining its use to the Terrans, showing how they could obtain recording of any specific material they wished to choose. It would appear in either printed or pictorial form or could be had on audio if they wanted it. Once he was certain they could make their own selections he left them to their study.

"This is the best break we could possibly have hoped for," Joyce whispered as Zlenon disappeared from their sight. "We can get anything we want in the whole library if I understand the operation of this gadget the way I think I do."

"That's the way it looks to me," Cameron answered. "But don't get your hopes too high. There must be a catch in it somewhere, the way they were trying to shoo us away from coming here."

They punched the buttons for the history of the planet they were on, scanning slowly from the present to earlier years. There were endless accountings of trading and commercial treaties between members of the Nucleus as shifts of economic balance occurred. There were stories of explorations and benevolent contacts with races on the outer worlds. Details of their most outstanding scientific discoveries, which seemed to come with profligate rapidity—

Cameron whipped back through the pages of the histories, searching only for a single item, one clue to the swift evolution from barbarism to peaceful co-operation. After an hour he was in the middle of that critical period when the Council despaired of its inability to cope with the Markovian menace.

But the stories of commerce and invention and far-flung exchange with other peoples continued. Nowhere was there any reference to the violence of the period. They went back two hundred—five hundred years—beyond the time when Council members first made contact with the Nucleus.

There was nothing.

Cameron sat back in complete puzzlement as it became apparent that it was useless to go back further. "The normal thing would be for them to brag all over the place about their great conquests. Even races who become comparatively civilized citizens ordinarily let themselves go when it comes to history. If they've had a long record of conquest and bloodshed, they say so with plenty of chest pounding. Of course, it's

padded out to reflect their righteous conquest over tyranny, but it's always there in *some* form.

"But nothing up to now has been normal about the development of the Markovian problem and this really tops it off—the complete omission of any reference to their armed conquests."

"Maybe this planet didn't participate very much. Perhaps only a small number of the Nucleus worlds were responsible for it," said Joyce.

Cameron shook his head. "No. The Council records show that the Nucleus as a unit was responsible, and that virtually all the worlds are specifically mentioned. And even if this one had been out of it completely you could still expect references to it because there was constant interchange with most of the other planets. We can try another one, though—"

They tried one more, then a half dozen in quick scanning. They swept through a summarization of the Nucleus as a whole during that critical period.

There was nothing to show that the Markovians had ever been anything but peace-loving citizens intent on pursuit of science, commerce, and the arts.

"This could have been rigged for our special benefit," said Joyce thoughtfully as they ended the day's futile search. "They didn't want to apply enough pressure to keep us from coming, but they did want to make sure we wouldn't find out anything about their past."

Cameron shook his head slowly. "It couldn't have been done in the time they've had. Simply cutting out what they didn't want to show us wouldn't have done it. There's too much cross reference to all periods involved. It's a complete phony, but it's not something done on the spur of the moment just for our benefit. It's too good for that."

"Maybe they've had it for a *long* time—just in case somebody like us should come along."

"It's possible, but I don't think that's right either," said Cameron. "I can't give you any reason for thinking so—except the phoniness goes deeper than merely deceiving an investigator. Somehow I have the feeling that the Markovians are even deceiving themselves!"

They left the building and took the car back to the house of Marthasa without seeing Zlenon again. Their Markovian host was waiting. Cameron thought he sensed a trace of tension in Marthasa that wasn't there before as he led them to seats in the garden.

"We don't like to boast about the Nucleus," he said with his customary volubility, "but we have to admit we are proud of our science and technology. Few civilizations in the Universe can match it. That's not to disparage the fine accomplishments of the Terrans, you understand, but it's only *natural* that out here on these older worlds—"

They listened half attentively, trying in their imaginations to pierce

the armor he used to defend so frantically the thing the Markovians did not want the outer worlds to know anything about.

The talk went on during mealtime. Marthasa's wife caught the spirit of it and they both regaled the Terrans with accounts of the grandeur of Markovian exploits. Cameron grew more and more depressed by it, and as they retired to their rooms early he began to realize how absolutely complete was the impasse into which they had been driven.

"They've let us in," he said to Joyce. "They've shown us the history they've written of themselves. There's no way in the Universe we can stand up and boldly challenge that history and call them the liars we know they are."

"But they must know of the histories written on other Council worlds about their doings," said Joyce. "Maybe we could reach a point where we could at least ask about them. Ask how it is that other histories show that a hundred and twenty years ago a fleet of Markovian ships swept unexpectedly out of space and looted and decimated the planet Lakcaine VI. Ask why the Markovian history says only that the Nucleus concluded six new commercial treaties to the benefit of all worlds concerned in that period, without any mention of Lakcaine VI."

"When you start asking questions like that you've got to be ready to run. And if it fizzles out you've lost all chance of coming back for a second try. That could fizzle out because they simply deny the validity of all history outside their own."

"Then we might as well pack and go home if you're not going to challenge any of this stuff they hand out. We won't find the answer by standing around and taking *their* word on everything."

"I forgot to tell you one thing," Cameron said slowly. "We may not have to take their word for it. Someone else here knows the truth of the situation, also."

"Who?"

"The Ids." He told her then of the warning Sal Karone had given him aboard the ship on the way to the Nucleus, the statement that "My Masters are a people who cannot yet be understood by the men of other worlds."

"The Ids know what the Markovians are and what they are trying to hide. I had almost overlooked that simple fact."

"But you can't go out and challenge them to tell the truth any more than you can the Markovians!" Joyce protested. "Because Sal Karone went out of his way to warn you doesn't mean he's going to get real buddy-buddy and tell you everything you want to know."

"No, of course not. But there's one little difference between him and the Markovians. He has admitted openly that he knows why we're here. None of the Markovians have done that yet. We don't have to challenge him because there already exists the tacit understanding that something is decidedly phony.

"And besides, he invited us to come and visit the Id communities outside the city. I think that's an invitation we should accept just as soon as possible."

IV

Sal Karone had not repeated his invitation that the Terrans visit the Id communities, but he showed no adverse reaction when Cameron said they would like to take him up on his previous offer.

"You will be very welcome," he said. A soft smile lightened his features. "I will notify my leaders you will come."

With a start, Cameron realized that the existence of any kind of community probably implied leaders, but he had ignored this in view of Marthasa's insistence that the Ids had no culture of their own. He wondered just how untrue that assertion might be.

For the first time, he sensed genuine disapproval in the attitude of Marthasa when he mentioned plans to go with Sal Karone to the Id centers. "There's nothing out there you'd want to see," the Markovian said. "Their village is only a group of crude huts in the forest. It'll be a waste of your time to go out there when there's so much else we could show you."

"Sal Karone suggested the visit before we arrived," said Cameron. "He'd be hurt if we turned him down. Perhaps just to satisfy him—"

Angry indecision hid behind Marthasa's eyes. "Well—maybe that makes it different," he said finally. "We try to do everything possible to make the Ids happy. It's up to you if you want to waste your time on the visit."

"I think I do. Sal Karone has been very attentive and pleasant to us. It's a small favor in return."

Early in the morning, two days later, they left with Sal Karone directing them to the Idealist center. They discovered that the term, at the edge of the city, was a mere euphemism. It was a long two-hour trip at the high speed of which the Markovian cars were capable.

The city itself vanished, and a thickly wooded area took its place during the last half of the journey, reminding them of the few remote, peaceful forests of Earth. Then, as the car slowed, they left the highway for a rough trail that led for a number of miles back into the forest. They came at last into a clearing circled by rough wooden dwellings possessing all the appearance of crude, primitive existence on little more than a subsistence level.

"This is the village of our Chief," said Sal Karone. "He will be pleased to explain all you may wish to know about the Idealist Way."

Cameron was shocked almost beyond speech by his first sight of the clearing. He had tried to prepare for the worst, but he had told himself that the Markovian's estimate of the Ids could not be true. Now he was forced to admit that it was. In con-

tact with all the skills of their Masters, which they would certainly be permitted to learn if they wanted to, the Ids chose primitive squalor when they were on their own.

Their serenity could be little more than the serenity of the savage who has no wants or goals and is content to merely serve those whose ambitions are greater. It was the serenity and peacefulness of death. The Ids had died—as a race—long ago. The Markovians were loud, boastful, and obnoxious, but that could be discounted as the awkwardness of youth in a race that would perhaps be very great in the Universe at a time when the Ids were wholly forgotten.

Cameron felt depressed by the sight. He began to doubt the wisdom of his coming here in hope of finding an answer to the Markovian deception. The warning of Sal Karone on shipboard seemed now like nothing more than a half ignorant demonstration of loyalty toward the Markovian Masters. Possibly there had been some talk which the Id had overheard and he had taken it upon himself to warn the Terrans—knowing perhaps nothing of the matter which the Markovians were reluctant to expose.

If he could have done so gracefully, Cameron felt he would have turned and gone back without bothering with the interview. His curiosity about the Ids themselves had all but vanished. The answer to their situation was obvious. And he had maintained such high hope that somehow his expectation in them would be fulfilled during this visit.

There was a satisfying cleanliness apparent in everything as Sal Karone led them to the largest of the buildings. Joyce seemed to be enjoying herself as she surveyed the surroundings with an interest Cameron had lost.

As they entered the doorway a thin, straight old man with a white beard arose from a chair and approached them in greeting. The ancient, conventional, patriarchal order, Cameron thought. He could see the whole setup in a nutshell right now. Squalid communities like this where the too-old and the too-young were nurtured on the calcified traditions to which nothing was ever added. The able serving in the homes of the Markovians, providing sustenance for themselves and those who depended on them. The Markovians were generous indeed in not referring to the Ids as slaves. There was little else they could ever be called.

The Chief was addressed as Venor by Sal Karone, who introduced them. "It is kind of you to include our village in your visit to the Nucleus," said Venor. "There are many more spectacular things to see."

"There is often greatest wisdom in the least spectacular," said Cameron, trying to sound like a sage. "Sal Karone was kind enough to invite us to your center and said there was much you could show us."

"The things of the soul are not possible to *show,*" said Venor gently. "We wish there were time that we might teach you some of the great things our people have learned in

their long wanderings. I am told that your profession and your purpose in being here is the study of races and their actions and the things they have learned."

With a start, Cameron came to greater attention. He was certain he had never given any such information in the presence of Sal Karone or Marthasa. Yet even Venor knew he was a sociologist! Here was the first knowledge that must lie behind the evidence of the undercurrent of objections of the Markovian representative in the Council and Premier Jargla.

And this primitive patriarch was in possession of it.

Relations between the individuals of this planet were something far more complex than Cameron had assumed. He hesitated a moment before speaking. Just why had this bait been so innocently thrown to him? Marthasa had never mentioned it. Yet had the Markovians asked for an attempt to get an admission from him for their own purposes? And what purposes—?

He abandoned caution, and nodded. "Yes, that is the thing I am interested in. I had hoped to study the history and ways of the Markovians. As Sal Karone has told me, they don't want strangers to make such a study. You are perhaps not so unwilling to be known—?"

"We wish the entire Universe might know of us and be as we are."

"You hardly make that possible, subjugating your identity so completely to that of another race. The worlds will never know of you unless you become strong and unified as a people and obtain a name of your own."

"Our name is known," said Venor. "We are the Idealists. You will not find many worlds on which we are unknown, and they call us the ones who serve. Even on your world you have the saying of a philosopher who taught that any who would be master should become the servant of all. Your people once understood it."

"Not as a literal undertaking," said Cameron. "You can't submerge your entire racial identity as you have done. That is not what the saying meant."

"To us it does," said Venor solemnly. "We would master the Universe—and therefore we must serve it. That is the core of the law of the Idealists."

Cameron let his gaze scan through the window to the small clearing in the thick forest, to the circle of wooden houses. *We would master the Universe*—he restrained a smile.

"You cannot believe this," said Venor, "because you have never understood the mark of the servant or the mark of the master. How often is there difficulty in distinguishing one from the other!"

And how often do the illusions of the mind ease the privations of the body, Cameron thought. So that was the source of the Idealist serenity. Wherever they went they considered themselves the masters through service—and conversely, those they

served became the slaves, he supposed. It was a pleasant, easy philosophy that hurt no one. Except the ones who believed it. They died the moment they accepted it, for all initiative and desire were gone.

"The master is he who guides the destiny of a man or a race," said Venor almost in meditation. "He is not the man who gathers or disperses the wealth, or who builds the cities and the ships to the stars. The master is he who teaches what must be done with these things and how a people shall expend their lives."

"And the Markovians do this, in obedience to you?" said Cameron whimsically.

"Wherever my people are," answered Venor, "strife ceases and peace comes. Who can do this is master of worlds."

There was a strange solemnity about the voice and figure of the old Idealist that checked the sense of ridiculousness in Cameron. It seemed somehow strangely moving.

"You believe the worlds are better," he asked gently, "just because you are there?"

"Yes," said Venor, "because we are there."

There was a pathos about it that fired Cameron's anger. On scores of worlds there were primitive groups like this one, blinding themselves with a glory that didn't exist, in the grip of ancient, meaningless traditions. The younger ones—like Sal Karone—were intelligent, worth salvaging, but they could never be lifted out of this mire of false belief unless they could be shown how empty it was.

"Nothing you have said explains the mystery of how this great thing is accomplished," said Cameron almost angrily. "Even if we wanted to believe it were true, it is still as utterly incomprehensible as before we came."

"There is a saying among us," said Venor kindly. "Translated into your tongue it would be: How was the wild dog tamed, and a saddle put upon the fierce stallion?"

Stubbornly, then, Venor would say no more about the philosophy of the Idealists. He spoke freely of the many other worlds upon which the Idealists lived and served, and he affirmed the tradition that they did not even know the place of their origin, the planet that might have been their home world.

He was evasive, however, when Cameron asked when the first contact was made between his people and the Markovians. There was something that the Ids, too, were holding back, the sociologist thought, and there was no apparent reason for it.

Recklessly, he decided nothing could be lost by attempting to blast for it. "Why have the Markovians consistently lied to us?" he said. "They've given us their history—and if your people know the feelings of other worlds they know this history is a lie. Only a few generations ago the Markovians pirated and plundered these worlds, and now they pose

as little tin gods with a silver halo. Why?"

Sal Karone stood by with a look of horror on his face, but Venor made no sign of alarm at this forbidden question. He merely inclined his head slowly and repeated, "How was the wild dog tamed, and a saddle put upon the fierce stallion?"

That was the end of the interview. The Ids insisted, however, that he inspect the rest of the village and they personally guided the Terrans on the tour. Cameron's trained eye took in at a glance, however, the evidence supporting his previous conclusion. The artifacts and buildings demonstrated a primitive forest culture. The other individuals he saw were almost entirely the old and very young—the ones unsuitable as servants to the Markovians. Venor explained that family life among them paralleled in general that of the Masters. Whole Idealist families lived and served as units in the Markovian household. Exceptions existed in the case of Sal Karone and others of his age who were separated from their families and had not yet begun their own.

As they returned to the car Venor took their hands. He pressed Cameron's warmly and looked into his eyes with deep sincerity. "You have made us glad by your presence," he said. "And when the time comes for you to return, we shall repay all the pleasure you have given us."

"I'm afraid we won't be able to do that," said Cameron. "We appreciate your hospitality, but I'm sure time will not permit us to visit you again, as much as we'd like to." In the past few minutes he had reached the conclusion that further research on this whole planet was futile. The best thing they could do was go somewhere else in the Nucleus and make a fresh start.

Venor shook his head, smiling. "We will see each other again, Joyce and Cameron. I feel that the day will be very soon."

It was senseless to let himself be irritated by the senile patriarch who spoke out of a world of illusion but Cameron could not help feeling nettled as he started back to the city. Somehow it seemed impossible to regard Venor as merely a specimen for sociological research. The Chief of the Idealists reached out of his unreal world and made his contact with the Terrans a personal thing—almost as if he had spent all his life waiting for their coming. There was a sense of intimacy against which Cameron rebelled, and yet it was not an unpleasant thing.

Cameron's mind oscillated between the annoyance of Venor's calm assertion that they would be back shortly, and the nonsense of the Id belief that they controlled the civilizations in which they were servants. How was the wild dog tamed, and a saddle put upon the fierce stallion?

He smiled faintly to himself, wondering if the Markovians were fully aware that the Ids regarded them as tamed dogs and saddled stallions. They couldn't help knowing, of

course, but it was hard to imagine Marthasa and his wife being very much amused by such an estimate. The situation would be intolerable, however, if it were met by anything except amusement. It might be a mildly explosive subject, but he was going to find out about that one small item before moving on, anyway, Cameron decided.

Sal Karone was strangely silent during the whole of the return trip. He offered no comments and made only brief, noncommittal replies to questions about the country through which they passed. He seemed depressed by the results of their visit. Probably because the violation of his warning to not question the lives of the Markovians. It was a curious evidence of their completely unreal, proprietary attitude in respect to their Masters. They'd have to investigate Marthasa's response as thoroughly as possible. There seemed to be no taboo on discussion of the Ids with him.

His annoyance at their acceptance of the invitation to the Id village appeared to have vanished as he greeted them upon their return. "We delayed eating, thinking you'd be back in time. If you'll join us in the dining room as soon as you're ready—"

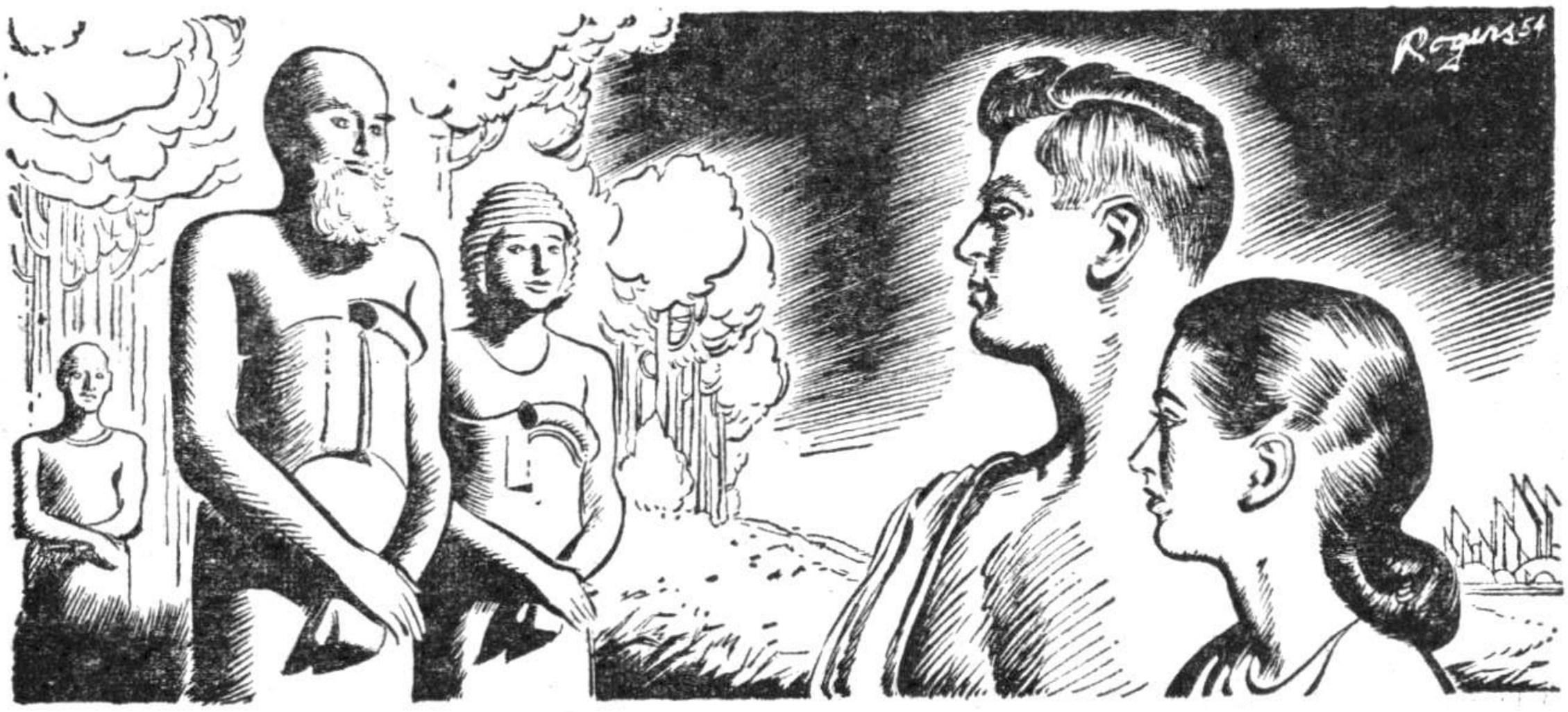
The villa of Marthasa seemed different after the day's experience with the Ids, although Cameron was certain nothing had changed either in a physical way or in their relations with the Markovians. It was as if his senses had been somehow sharpened to detect an undercurrent of feeling of which he had previously been unaware. Glancing at Joyce, he sensed she felt the same.

"I have the feeling that we missed something," she said, as they changed clothes to join Marthasa and his wife. "There was something Venor wanted us to know and wouldn't say. I would almost like to go back there again before we go away."

Cameron was surprised at his own annoyance with Joyce's statement. It reflected the impressions in his own mind which he was trying to ignore. "Nonsense," he said. "There's no use trying to read great profundity in the words of an old patriarch of the woods. He's nothing except what he appears to be."

The Markovians talked easily of Venor and the rest of the Ids. "We have tried to get him to join us in the city," said Marthasa as the meal began, "but he won't hear of it. It seems to give him a sense of importance to live out there alone with his retinue and have the other Ids come to him with their problems. He's a kind of arbiter and patriarch to all of them for many miles around."

While Marthasa talked Cameron tried to bring his awareness of all the varied facets of the problem together and see it whole, as he now understood it. The Markovians, a vast pirate community, had voluntarily abandoned freebooting for reasons yet to be discovered. They had turned their backs upon it so forcibly that they hid even the history of their



depredations. And one of their last acts must have been the capture of a large colony of Idealists who were forced into servitude. Now the Ids compensated their enslavement by the religious belief that service made them masters over the ex-pirates, convincing themselves that *they* had changed the Markovians, taming them like wild dogs, saddling them as fierce stallions—

Cameron wondered if he dared, and then dismissed the thought that there could be any risk. It was too ridiculous!

There was even a half-malicious smile on his lips as he broke into Marthasa's conversation. "One of the things that made me very curious today," he said, "was the general reaction of your people to the Idealist illusion that they have *tamed* you—as expressed in their aphorism about how was the wild dog—?"

He never finished. Across the table the faces of the Markovians had frozen in sudden bitterness. The shield of friendliness vanished under the cold glare from their eyes.

Marthasa's lips seemed to curl as he whispered, "So you came like all the rest! And we wanted so much to believe you were honest. A study! A chance to find material for lies about the Nucleus to spread among all the Council worlds."

He continued almost sadly, "You will be confined to your quarters until transfer authorities can arrange for your return to Earth. And you may be sure that never again will such a scheme get one of your kind into the Nucleus again."

But there was no hint of sadness in his wife's face. She glared coldly. "I said they should never had been permitted to come!"

Cameron rose in sudden bewildered protest. "I assure you we have no intention—" he began.

And then he stopped. In one moment of incredible clarity while they stood there, eyes locked in bitter stares, he understood. He knew the myth was not a myth. It was cold,

unbelievable reality. The Ids *had* tamed the Markovians.

In a moment of fear he wondered if it were anything more than a thin shell that could be shattered by a whisper from a stupid dabbler in cultures, who really knew nothing at all about the profession to which he pretended.

V

As if upon some secret signal Sal Karone appeared from the serving room at their left.

"Our visitors are no longer our guests," Marthasa said sharply with accusing eyes still upon Cameron. "They will remain in their rooms until time for deportation.

"I trust it will not be necessary to use force," he said directly to Cameron.

"Of course not. But won't you let me explain—won't you even allow an apology for breaking a taboo we did not understand?"

"Is it not taboo among all civilized peoples, including your own, to invent and spread lies about those who wish you only well?"

It was useless to argue, Cameron saw. He turned, taking Joyce's arm, and allowed Sal Karone to lead them back to their rooms. As they paused at the doorway the Id spoke without expression on his dark face. "This is not a good thing, Cameron Wilder. It would have been best for you to have considered my warning."

He turned and stepped away, locking the door behind him.

Joyce slumped on the bed in dejection. "This is a fine fix we've got ourselves into, being declared *persona non grata* before we even get a good start! They'll remember *that* back home when A Study of the Metamorphosis of the Markovian Nucleus is mentioned in professional circles!"

"Don't rub it in," Cameron said, half angrily. "How was I to know that was such a vicious taboo? It can't be any secret to the Markovians that the Ids look upon them as tamed. Why should they get their hackles up because *I* mentioned it?"

"All I know is we're washed up as of now. What do we do when we get back home?"

Cameron stood with his back to her, looking through the windows to the garden beyond. "I'm not thinking of that," he said. "Can't you see we haven't failed? We've almost got it—the thing we came to find. We *knew* why the Markovians suddenly became good Indians. The Ids actually did tame them. We've got to find out how such an apparently impossible thing could be done."

"Do you really believe that's what happened?" asked Joyce.

Cameron nodded. "It's the only thing there is to believe. If it weren't true, Marthasa and his wife would have laughed it off as nonsense. Getting all huffy and talking about deportation for cooking up lies is the best proof you could ask for that we hit pay dirt. Don't ask me how I think the Ids could do it. *That's* what I'm going to find out."

"How?"

"I don't know."

But he did have an idea that if he could somehow get word to the old Id chieftain help could be had. He knew he was straining to believe things he wanted to believe, yet it seemed as if this were almost the very thing Venor had tried to convey the day before but had left unspoken.

There was only one possibility of establishing contact, however, and that was through Sal Karone. A remote chance indeed, Cameron thought, in view of the relationship between the Markovian and his *sargh*. As a last resort it was worth trying, however.

It looked as if they would not have even this chance as the evening grew darker. Cameron kept watch through the windows in the hope of signaling Sal Karone in case he should appear. They hoped he might come to the room for a final check of their needs for the night as he usually did.

But he did not appear.

Cameron finally went to bed after Joyce was long asleep. He turned restlessly, beating his mind with increasing wonder as to how it could be so incredibly true that the Idealists were the actual masters of the Nucleus. That they had somehow tamed the murderous, piratical Markovians. He couldn't have known this was it!

One thing he could understood, however, was the Markovians reluctance to have visitors—and their careful watch over them. Marthasa had been more than a host, he thought. He was a guard as well, trying to keep the Terrans from discovering the unpleasant reality concerning the influence of the Ids. He had slipped in allowing the visit to Venor.

At dawn there was the sound of their door opening and Cameron whirled from his dressing, hopeful it might be Sal Karone. It was Marthasa, however, grim and distant. "I have obtained word that your deportation can be accomplished today. Premier Jargla has been informed and concurs. The Council has been notified and offers no protestations. You will ready yourselves before the evening hour."

He slammed the door behind him. Joyce turned down the covers in the other room and sat up. "I wonder if he isn't even going to feed us today?"

Cameron made no answer. He finished dressing hurriedly and kept a frantic watch for any sign of Sal Karone.

At last there was a knock on the door and the Id appeared with breakfast on a cart. Cameron exhaled with relief that it was not one of the other *sarghs* in the household.

Sal Karone eyed them impassively as he wheeled in and arranged the food on the table by a window. Cameron watched, estimating his chances.

"Your Chief, Venor, was very kind to us yesterday," he said quietly. "Our biggest regret in leaving is that our conversation with him must go unfinished."

Sal Karone paused. "Were there

things you had yet to say to him?" he asked.

"No—there were things Venor wanted to tell us. You heard him. He wanted us to come back. It is completely impossible for us to see him again before we go?"

Sal Karone straightened and set the utensils on the table. "No, it is not impossible. I have been instructed to bring you back to the village if it should be your request."

Cameron felt a surge of eager excitement within him. "When? Our deportation is scheduled for today. How can we get there? How can we avoid Marthasa and the Markovians?"

"Stand very quietly," said Sal Karone, that sense of power and command in his voice and bearing as Cameron had seen it once before aboard the spaceship. "Now," he said. "Close your eyes."

There was a sudden wrenching twist as if two solid surfaces had slammed them from front and back, and a third force had thrust them sideways.

They opened their eyes in the wooden house of Venor, in the village of the Idealists.

"We owe you apologies," said Venor. "We hope you are not harmed in any way."

Cameron stared around uncertainly. Joyce clutched his hand. "How did we—?" Cameron stammered.

"Teleportation is the descriptive term in your language, I believe," said Venor "It was rather urgent that you come without further delay so we resorted to it. Nothing else would do in the face of Marthasa's action. Sit down if you will, please. If you wish to rest or eat, your quarters are ready."

"Our quarters—! Then you *did* expect us back. You knew this was going to happen exactly as it has!"

"Yes, I knew," said Venor quietly. "I planned it this way when word first came to us of your visit."

"I think we are entitled to explanations," Cameron said at last. "We seem to have been pieces in a game we knew nothing about."

And it had taken this long for the full impact of Venor's admission of teleportation to hit him. He closed his eyes in a moment's reaction of fright. He didn't want to believe it —and knew he must. These Idealists —who could master galaxies and tame the wild Markovians— was there anything they could not do?

"Not a game," Venor protested. "We planned this because we wanted you to see what you have seen. We wanted a man of Earth to know what we have done."

"But don't the Markovians realize the foolishness of deporting us because we stumbled onto the relationship between you and them? And if you are in control how can they issue such an order- -unless you want it?"

"Our relationship is more complex than that. There are different levels of control. We operate the one that brought you here—" He let Cameron consider the implication of the unfinished statement.

Then he continued, "To understand the Markovians' reason for deporting you, consider that on Earth men have tamed wolves and made faithful, loyal dogs who can be trusted. Dogs who have forever lost the knowledge their ancestors were fierce marauders ready to rip and tear the flesh of any man or beast that came their way.

"Consider the dogs only a generation or two from the vicious wolves who were their forebears. The old urges have not entirely died, yet they want to know man's affection and trust. Could you remind them of what their kind once was without stirring up torment within them?

"So it is with the Markovians. They are peaceful and creative, but only a few generations behind them are pirates who were not fit to sit in the Councils of civilized beings. They have no tradition of culture to support them. It knocks the props out from under them, so to speak, to have it known what lies behind them. They cannot be friends with such a man. They cannot even endure the knowledge among themselves."

"Then I was right!" Cameron exclaimed. "Their phony history *was* set up to deceive their own people as well as others."

"Yes. The dog would destroy all evidence of his wolf ancestry. It has been an enormous project, but the people of the Nucleus have been at it a long time. They have concocted a consistent history which leaves out all evidence of their predatory ancestry. The items of reality which were possible to leave have been retained. The gaps between have been bridged by fictionized accounts of glorious undertakings and discoveries. Most of the Markovian science has been taken from other cultures, but now their history boasts of heroes and discoverers who never lived and who were responsible for all the great science they enjoy."

"But nothing stable can be built upon such an unhealthy foundation of self-deception!" Cameron protested.

"It is not unhealthy—not at the present moment," said Venor. "The time will come when it, too, will be thrust aside and a tremendous effort of scholarship will extract the elements of truth and find that which was suppressed. But the Markovians themselves will do it—a generation of them who can afford to laugh at the fears and fantasies of their ancestors."

"This tells us nothing of how you were able to make a creative people out of a race of pirate marauders," said Cameron.

"I gave you the key," said Venor. "It was one used long ago by your own people before it was abandoned.

"How was the savage wolf tamed to become the loyal, friendly dog? Did ancient man try to exterminate the wolves that came to his caves and carried off his young? Perhaps he tried. But he learned, perhaps accidentally, another way of conquest. He found the wolf's cubs, and learned to love them. He brought the cubs

home and cared for them tenderly and his own children played with them and fed them and loved them.

"It took time, but eventually there were no more wild wolves to trouble man, because he had discovered a great friend, the dog. And man plus dog could handle wolf with ease. Dog forgot in time what his forebears were and became willing to defend man against his own kind—because man loved him.

"It happened again and again. Agricultural man hated the wild horse that ate his grain and trampled his fields. But he learned to love the horse, too, after a while. Again—no more wild horses."

"But you can't take a predatory, savage pirate and love him into decency!" Cameron protested.

"No," Venor agreed. "It is too difficult ordinarily at that level, and wasteful of time and resources. But I didn't say that is what happened. You don't tame a wolf by loving it, but the *cubs*—yes. And even pirates have cubs, who are susceptible to being loved.

"The first weapon was hate. But after learning the futility of it, sentient creatures discovered another, the succeeding evolutionary emotion. It is pure savagery in its destructive power, a thousand times more effective in annihilating the enemy.

"You've thought 'Love thy enemy' was a soft, gentle, futile doctrine! Actually, instead of merely killing the enemy it twists his personality, destroys his identity. He continues to live, but he has lost his integrity as an entity. The wolf cub never becomes an adult wolf. He becomes Dog.

"It is not a doctrine of weakness, but the ultimate weapon of destruction. It can be used to induce any orientation desired in the mind of the enemy. He'll do everything you want him to—because he has your love."

"How did you apply that to the Markovians?" asked Joyce in almost a whisper.

"It was one of the most difficult programs we have ever undertaken," said Venor. "There were comparatively few of us and such a tremendous population of Markovians. We had predicted long ago, even before the organization of the Council, the situation would grow critical and dangerous. By the time the Council awoke to the fact and started its futile debates we had made a strong beginning.

"We arranged to be in the path of a Markovian attack on one of the worlds where our work was completed. The Markovians were only too happy to take us into slavery and use us as victims in their brutal sports."

"You didn't deliberately fall into a trap where you allowed yourselves to be killed and tortured by them?" exclaimed Cameron.

Venor smiled. "The Markovians thought we did. We could hardly do that, of course. Our numbers were so small compared with theirs that we wouldn't have lasted very long. And, obviously, it would have been

plain stupid. There is one key that must not be forgotten: An effective use of love requires an absolute superiority on the levels attainable by the individual to be tamed. So, in this case, we had to have power to keep the Markovians from slaughtering us or we would have been unable to accomplish our purpose.

"Teleportation is of obvious use here. Likewise, psychosomatic controls that can handle any ordinary wound we might permit them to inflict. We gave them the illusion of slaughtering and torturing us, but our numbers did not dwindle."

"Why did you give them such an illusion?" Joyce asked. "And you say you *permitted* them to inflict wounds—?"

Venor nodded. "We were in their households, you see, employed as slaves and assigned the care of their young. The cubs of the wolf were given into our hands to love—and to tame.

"These Markovian children were witnesses to the supposed torture and killing of those who loved them. It was a tremendous psychic impact and served to drive their influence toward the side of the slaves. And even the adults slowly recognized the net loss to them of doing away with servants so skilled and useful in household tasks and caring for the young. The games and brutality vanished spontaneously within a short time. Markovians, young and old, simply didn't want them any longer.

"During the maturity of that first generation of young on whom we expended our love our position became more secure. These were no longer wolves. They had become dogs, loyal to those who had loved them, and we could use them now against their own kind. Influences to abandon piracy against other peoples began to spread throughout the Nucleus.

"Today the Markovians are no longer a threat capable of holding the Council worlds in helpless fear. They long ago ceased their depredations. Their internal stability is rising and is almost at the point where we shall be able to leave them. Our work here is about finished."

"Surely all this was unnecessary!" Joyce said. "With your powers of teleportation and other psionic abilities you must possess it should have been easy for you to *control* the Markovians directly, force them to cease their piracy—"

"Of course," said Venor. "That would have been so much easier for us. And so futile. The Markovians would have learned nothing through being taken over by us and operated externally. They would have remained the same. But it was our desire to change them, teach them, accomplish genuine learning within them. It is always longer and more difficult this way. The results, however, are more lasting!"

"*Who* are you people—*what* are you?" Cameron said with sudden intensity. "You have teleportation—and how many other unknown psychic powers? You have forced us to believe you can tame such a vicious

world as the Markovian Nucleus once was.

"But where is there a life of your own? With all your powers you must live at the whim of other cultures. Where is *your* culture? Where is your own purpose? In spite of all you have, your life is a parasitical one."

Venor smiled gently. "Is not the parent—or the teacher—the servant of the child?" he said. "Has it not always been so if a species is to rise very far in its conquest of the Universe?

"But this does not mean that the parent or teacher has no life of his own. You ask where is our culture? The culture of *all* worlds is ours. We don't have great cities and vast fleets. The wolf cubs build these for us. They carry us across space and shelter us in their cities.

"Our own energies are expended in a thousand other and more profitable ways. We have sought and learned a few of the secrets of life and mind. With these we can move as you were moved, when we choose to do so. From where I sit I can speak with any of our kind on this planet or any world of the entire Nucleus. And a few of us, united in the effort, can touch those in distant galaxies.

"What culture would you have us acquire, that we do not have?" Venor finished.

Without answer, Cameron arose and strode slowly to the window, his back to the room. He looked out upon the rude wooden huts and the towering forest beyond. He tried to tell himself it was all a lie. Such things couldn't be. But he could feel it now with increasing strength, as if all his senses were quickening—the benign aura, the indefinable wash of power that seemed to lap at the edge of his mind.

Out of the corner of his eye he could see Joyce's face, almost radiant as she, too, sensed it here in the presence of the Ids.

Love, as a genuine power, had been taught by every Terran philosopher of any social worth. But it had never really been tried. Not in the way the Ids understood it. Cameron felt he could only guess at the terrible discipline of mind it required to use it as they did. The analogy of the wolf cubs was all very well, and man had learned to go that far. But there is a difference when your own kind is involved, he thought.

Perhaps it was out of sheer fear of each other that men continued to try to sway with hate, the most primitive of all their weapons.

It's easy to hate, he thought. Love is hard, and because it is, the tough humans who can't achieve it and have the patience to manipulate it must scorn it. The truly weak ones, they're incapable of the stern and brutal self-discipline required of one who loves his enemy.

But men had known how. Back in the caves they had known how to conquer the wolf and the wild horse. Where had they lost it?

The vision of the buildings and the forest with its eternal peace was

still in his eyes. What else could you want, with the whole Universe in the palm of your hand?

He turned sharply. "You tricked us into betraying ourselves to Marthasa, and you said that you planned it this way when you first heard of our coming. But you have not yet said why. Why did you want us to see what you had done?"

"You needed to have evidence from the Markovians themselves," said Venor. "That is why I led you to the point where the admission would be forced from them. The problem you came to solve is now answered, is it not? Is there anything to prevent you returning to Earth and writing a successful paper on the mystery of the Markovians?"

"You know very well there is," said Cameron with the sudden sense that Venor was laughing gently at him. "Who on Earth would believe what you have told me—that a handful of meek, subservient Ids had conquered the mighty Markovian Nucleus?"

He paused, looking at Joyce who returned his intense gaze.

"Is that all?" said Venor finally.

"No that is not all. After taking us to the heights and showing us everything that lies beyond, are you simply going to turn us away empty-handed?"

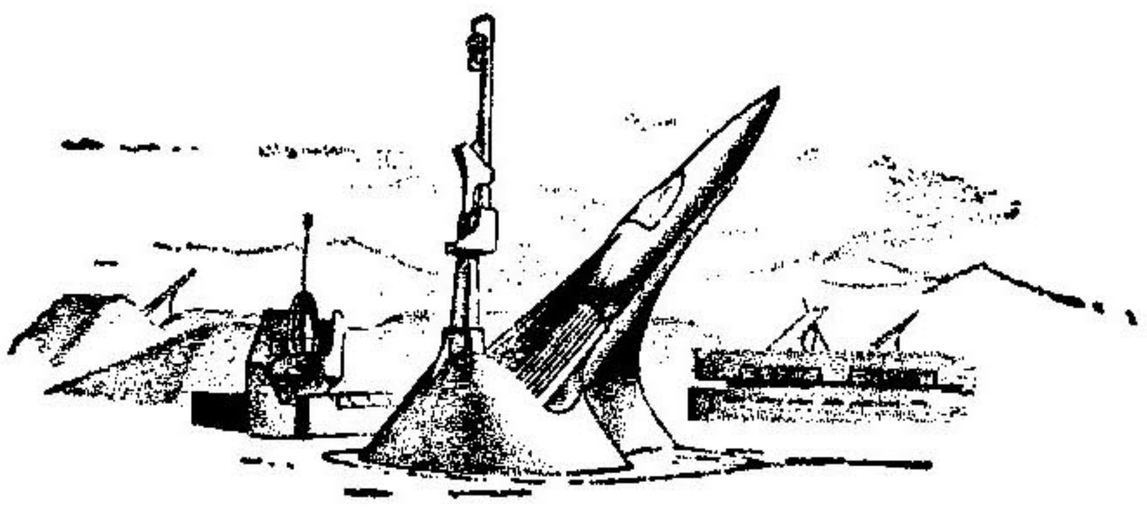
"What would you have us give you?"

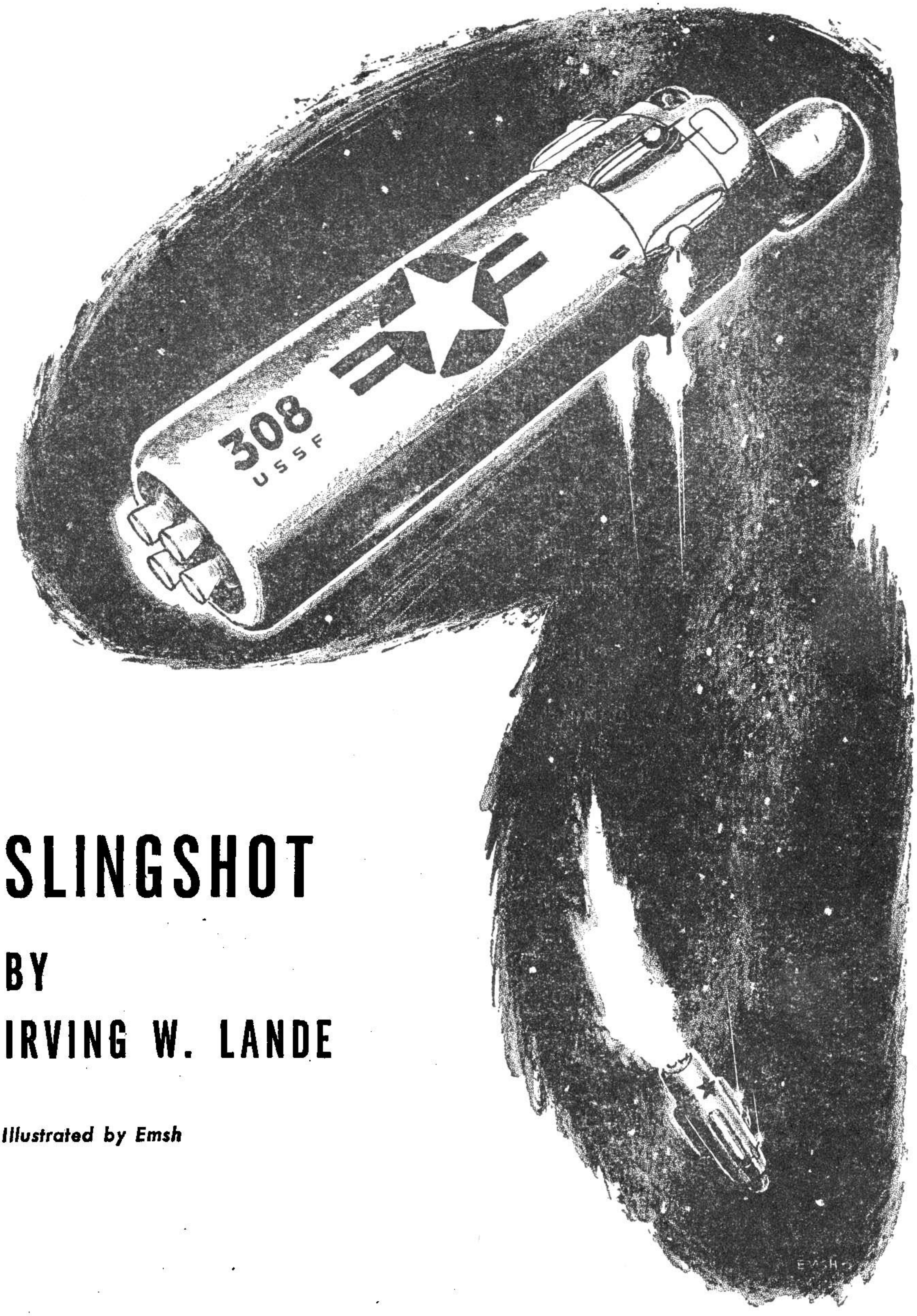
"This," said Cameron, gesturing with his hand to include the circle of all of them, and the community beyond the window. "We want what you have discovered. Is your circle a closed one—or can you admit those who would learn of your ways but are not of your race?"

Venor's smile broadened as he arose and stepped toward them, and they felt the warm wave of acceptance from his mind even before he spoke. "This is what we brought you here to receive," he said. "But you had to ask for yourselves. We wanted men of Earth in our ranks. There are many races and many worlds who make up the Idealists. That is why it is said that the Ids do not know the home world from which they originally came. It is true, they do not. We are citizens of the Universe.

"But we have never been represented by a native of Earth, which needs us badly. Will you join us, Terrans?"

THE END





SLINGSHOT

BY IRVING W. LANDE

Illustrated by Emsh

The slingshot was, I believe, one of the few weapons of history that wasn't used in the last war. That doesn't mean it won't be used in the next!

"Got a bogey at three o'clock high. Range about six hundred miles." Johnson spoke casually, but his voice in the intercom was thin with tension.

Captain Paul Coulter, commanding Space Fighter 308, 58th Squadron, 33rd Fighter Wing, glanced up out of his canopy in the direction indicated, and smiled to himself at the instinctive reaction. Nothing there but the familiar starry backdrop, the moon far down to the left. If the light wasn't right, a ship might be invisible at half a mile. He squeezed the throttle mike button. "Any IFF?"

"No IFF."

"O.K., let me know as soon as you have his course." Coulter squashed out his cigar and began his cockpit check, grinning without humor as he noticed that his breathing had deepened and his palms were moist on the controls. He looked down to make sure his radio was snug in its pocket on his leg; checked the thigh harness of his emergency rocket, wrapped in its thick belly pad; checked the paired tanks of oxygen behind him, hanging level from his shoulders into their niche in the "cradle." He flipped his helmet closed, locked it, and opened it again. He tossed a sardonic salute at the photograph of a young lady who graced the side of the cockpit. "Wish us luck, sugar." He pressed the mike button again.

"You got anything yet, Johnny?"

"He's going our way, Paul. Have it exact in a minute."

Coulter scanned the full arch of sky visible through the curving panels of the dome, thinking the turgid thoughts that always came when action was near. His chest was full of the familiar weakness—not fear exactly, but a tight, helpless feeling that grew and grew with the waiting.

His eyes and hands were busy in the familiar procedure, readying the ship for combat, checking and rechecking the details that could mean life and death, but his mind watched disembodied, yearning back to earth.

Sylvia always came back first. Inviting smile and outstretched hands. Nyloned knees, pink sweater, and that clinging, clinging white silk skirt. A whirling montage of laughing, challenging eyes and tossing sky-black hair and soft arms tightening around his neck.

Then Jean, cool and self-possessed and slightly disapproving, with warmth and humor peeping through from underneath when she smiled. A lazy, crinkly kind of smile, like Christmas lights going on one by one. He wished he'd acted more grown up that night they watched

the rain dance at the pueblo. For the hundredth time, he went over what he remembered of their last date, seeing the gleam of her shoulder, and the angry disappointment in her eyes; hearing again his awkward apologies. She was a nice kid. Silently his mouth formed the words. "You're a nice kid."

I think she loves me. She was just mad because I got drunk.

The tension of approaching combat suddenly blended with the memory, welling up into a rush of tenderness and affection. He whispered her name, and suddenly he knew that if he got back he was going to ask her to marry him.

He thought of his father, rocking on the porch of the Pennsylvania farm, pipe in his mouth, the weathered old face serene, as he puffed and listened to the radio beside him. He wished he'd written him last night, instead of joining the usual beer and bull session in the wardroom. He wished—. He wished.

"I've got him, Paul. He's got two point seven miles of RV on us. Take thirty degrees high on two point one o'clock for course to IP."

Automatically he turned the control wheel to the right and eased it back. The gyros recorded the turn to course.

"Hold 4 G's for one six five seconds, then coast two minutes for initial point five hundred miles on his tail."

"Right, Johnny. One sixty-five, then two minutes." He set the timer, advanced the throttle to 4 G's, and stepped back an inch as the acceleration took him snugly into the cradle. The Return-To-Station-Fuel and Relative-Velocity-To-Station gauges did their usual double takes on a change of course, as the ship computer recorded the new information. He liked those two gauges—the two old ladies.

Mrs. RSF kept track of how much more fuel they had than they needed to get home. When they were moving away from station, she dropped in alarmed little jumps, but when they were headed home, she inched along in serene contentment, or if they were coasting, sneaked triumphantly back up the dial.

Mrs. RVS started to get jittery at about ten mps away from home, and above fifteen, she was trembling steadily. He didn't blame the old ladies for worrying. With one hour of fuel at 5 G's, you didn't fire a single squirt unless there was a good reason for it. Most of their time on a mission was spent free wheeling, in the anxiety-laden boredom that fighting men have always known.

Wish the Red was coming in across our course. It would have taken less fuel, and the chase wouldn't have taken them so far out. But then they'd probably have been spotted, and lost the precious element of surprise.

He blessed the advantage of better radar. In this crazy "war," so like the dogfights of the first world war, the better than two hundred mile edge of American radar was more

often than not the margin of victory. The American crews were a little sharper, a little better trained, but with their stripped down ships, and midget crewmen, with no personal safety equipment, the Reds could accelerate longer and faster, and go farther out. You had to get the jump on them, or it was just too bad.

The second hand hit forty-five in its third cycle, and he stood loose in the cradle as the power died.

Sixty-two combat missions but the government says there's no war. His mind wandered back over eight years in the service. Intelligence tests. Physical tests. Psychological tests. Six months of emotional adjustment in the screep. Primary training. Basic and advanced training. The pride and excitement of being chosen for space fighters. By the time he graduated, the United States and Russia each had several satellite stations operating, but in 1979, the United States had won the race for a permanent station on the Moon. What a grind it had been, bringing in the supplies.

A year later the Moon station had "blown up." No warning. No survivors. Just a brand-new medium-sized crater. And six months later, the new station, almost completed, went up again. The diplomats had buzzed like hornets, with accusations and threats, but nothing could be proven—there *were* bombs stored at the station. The implication was clear enough. There wasn't going to be any Moon station until one government ruled Earth. Or until the United States and Russia figured out a way to get along with each other. And so far, getting along with Russia was like trying to get along with an octopus.

Of course there were rumors that the psych warfare boys had some gimmick cooked up, to turn the U. S. S. R. upside down in a revolution, the next time power changed hands, but he'd been hearing that one for years. Still, with four new dictators over there in the last eleven years, there was always a chance.

Anyway, he was just a space jockey, doing his job in this screwball fight out here in the empty reaches. Back on Earth, there was no war. The statesmen talked, held conferences, played international chess as ever. Neither side bothered the other's satellites, though naturally they were on permanent alert. There just wasn't going to be any Moon station for a while. Nobody knew what there might be on the Moon, but if one side couldn't have it, then the other side wasn't going to have it either.

And meanwhile, the struggle was growing deadlier, month by month, each side groping for the stranglehold, looking for the edge that would give domination of space, or make all-out war a good risk. They hadn't found it yet, but it was getting bloodier out here all the time. For a while, it had been a supreme achievement just to get a ship out and back, but gradually, as the ships improved, there was a little margin left over for weapons. Back a year ago, the average patrol was nothing but a sightseeing tour. Not that there was much to see,

when you'd been out a few times. Now, there were Reds around practically every mission.

Thirteen missions to go, after today. He wondered if he'd quit at seventy-five. Deep inside him, the old pride and excitement were still strong. He still got a kick out of the way the girls looked at the silver rocket on his chest. But he didn't feel as lucky as he used to. Twenty-nine years old, and he was starting to feel like an old man. He pictured himself lecturing to a group of eager kids.

Had a couple of close calls, those last two missions. That Red had looked easy, the way he was wandering around. He hadn't spotted them until they were well into their run, but when he got started he'd made them look like slow motion, just the same. If he hadn't tried that hare-brained sudden deceleration. . . . Coulter shook his head at the memory. And on the last mission they'd been lucky to get a draw. Those boys were good shots.

"We're crossing his track, Paul. Turn to nine point five o'clock and hold 4 G's for thirty-two seconds, starting on the count . . . five—four—three—two—one—go!" He completed the operation in silence, remarking to himself how lucky he was to have Johnson. The boy loved a chase. He navigated like a hungry hawk, though you had to admit his techniques were a bit irregular.

Coulter chuckled at the ad lib way they operated, remembering the courses, the tests, the procedures practiced until they could do them backwards blindfolded. When they tangled with a Red, the Solter co-ordinates went out the hatch. They navigated by the enemy. There were times during a fight when he had no more idea of his position than what the old ladies told him, and what he could see of the Sun, the Earth, and the Moon.

And using "right side up" as a basis for navigation. He chuckled again. Still, the service had had to concede on "right side up," in designing the ships, so there was something to be said for it. They hadn't been able to simulate gravity without fouling up the ships so they had to call the pilot's head "up." There was something comforting about it. He'd driven a couple of the experimental jobs, one with the cockpit set on gimbals, and one where the whole ship rotated, and he hadn't cared for them at all. Felt disoriented, with something nagging at his mind all the time, as though the ships had been sabotaged. A couple of pilots had gone nuts in the "spindizzy," and remembering his own feelings as he watched the sky go by, it was easy to understand.

Anyway, "right side up" tied in perfectly with the old "clock" system Garrity had dug out of those magazines he was always reading. Once they got used to it, it had turned out really handy. Old Doc Hoffman, his astrogation prof, would have turned purple if he'd ever dreamed they'd use such a conglomeration. But

it worked. And when you were in a hurry, it worked in a hurry, and that was good enough for Coulter. He'd submitted a report on it to Colonel Silton.

"You've got him, Paul. We're dead on his tail, five hundred miles back, and matching velocity. Turn forty-two degrees right, and you're lined up right on him." Johnson was pleased with the job he'd done.

Coulter watched the pip move into his sightscreen. It settled less than a degree off dead center. He made the final corrections in course, set the air pressure control to eight pounds, and locked his helmet.

"Nice job, Johnny. Let's button up. You with us, Guns?"

Garrity sounded lazy as a well-fed tiger. "Ah'm with yew, cap'n."

Coulter advanced the throttle to 5 G's. And with the hiss of power, SF 308 began the deadly, intricate, precarious maneuver called a combat pass—a maneuver inherited from the aerial dogfight—though it often turned into something more like the broadside duels of the old sailing ships—as the best and least suicidal method of killing a spaceship. To start on the enemy's tail, just out of his radar range. To come up his track at 2 mps relative velocity, firing six .30 caliber machine guns from fifty miles out. In the last three or four seconds, to break out just enough to clear him, praying that he won't break in the same direction. *And to keep on going.*

Four minutes and thirty-four seconds to the break. Sixty seconds at 5 G's; one hundred ninety-two seconds of free wheeling; and then, if they were lucky, the twenty-two frantic seconds they were out here for—throwing a few pounds of steel slugs out before them in one unbroken burst, groping out fifty miles into the darkness with steel and radar fingers to kill a duplicate of themselves.

This is the worst. These three minutes are the worst. One hundred ninety-two eternal seconds of waiting, of deathly silence and deathly calm, feeling and hearing nothing but the slow pounding of their own heartbeats. Each time he got back, it faded away, and all he remembered was the excitement. But each time he went through it, it was worse. Just standing and waiting in the silence, praying they weren't spotted—staring at the unmoving firmament and knowing he was a projectile hurtling two miles each second straight at a clump of metal and flesh that was the enemy. Knowing the odds were twenty to one against their scoring a kill . . . unless they ran into him.

At eighty-five seconds, he corrected slightly to center the pip. The momentary hiss of the rockets was a relief. He heard the muffled yammering as Guns fired a short burst from the .30's standing out of their compartments around the sides of the ship. They were practically recoilless, but the burst drifted him forward against the cradle harness.

And suddenly the waiting was over. The ship filled with vibration as Guns opened up. *Twenty-five sec-*

onds to target. His eyes flicked from the sightscreen to the sky ahead, looking for the telltale flare of rockets—ready to follow like a ferret.

There he is! At eighteen miles from target, a tiny blue light flickered ahead. He forgot everything but the sightscreen, concentrating on keeping the pip dead center. The guns hammered on. It seemed they'd been firing for centuries. At ten-mile range, the combat radar kicked the automatics in, turning the ship ninety degrees to her course in one and a half seconds. He heard the lee side firing cut out, as Garrity hung on with two, then three guns.

He held it as long as he could. Closer than he ever had before. At four miles he poured 12 G's for two seconds.

They missed ramming by something around a hundred yards. The enemy ship flashed across his tail in a fraction of a second, already turned around and heading up its own track, yet it seemed to Paul he could make out every detail—the bright red star, even the tortured face of the pilot. Was there something lopsided in the shape of that rocket plume, or was he just imagining it in the blur of their passing? And did he hear a *ping* just at that instant, feel the ship vibrate for a second?

He continued the turn in the direction the automatics had started, bringing his nose around to watch the enemy's track. And as the shape of the plume told him the other ship was still heading back toward Earth, he brought the throttle back up to 12 G's, trying to overcome the lead his pass had given away.

Guns spoke quietly to Johnson. "Let me know when we kill his RV. Ah may get another shot at him."

And Johnny answered, hurt, "What do you think I'm doing down here—reading one of your magazines?"

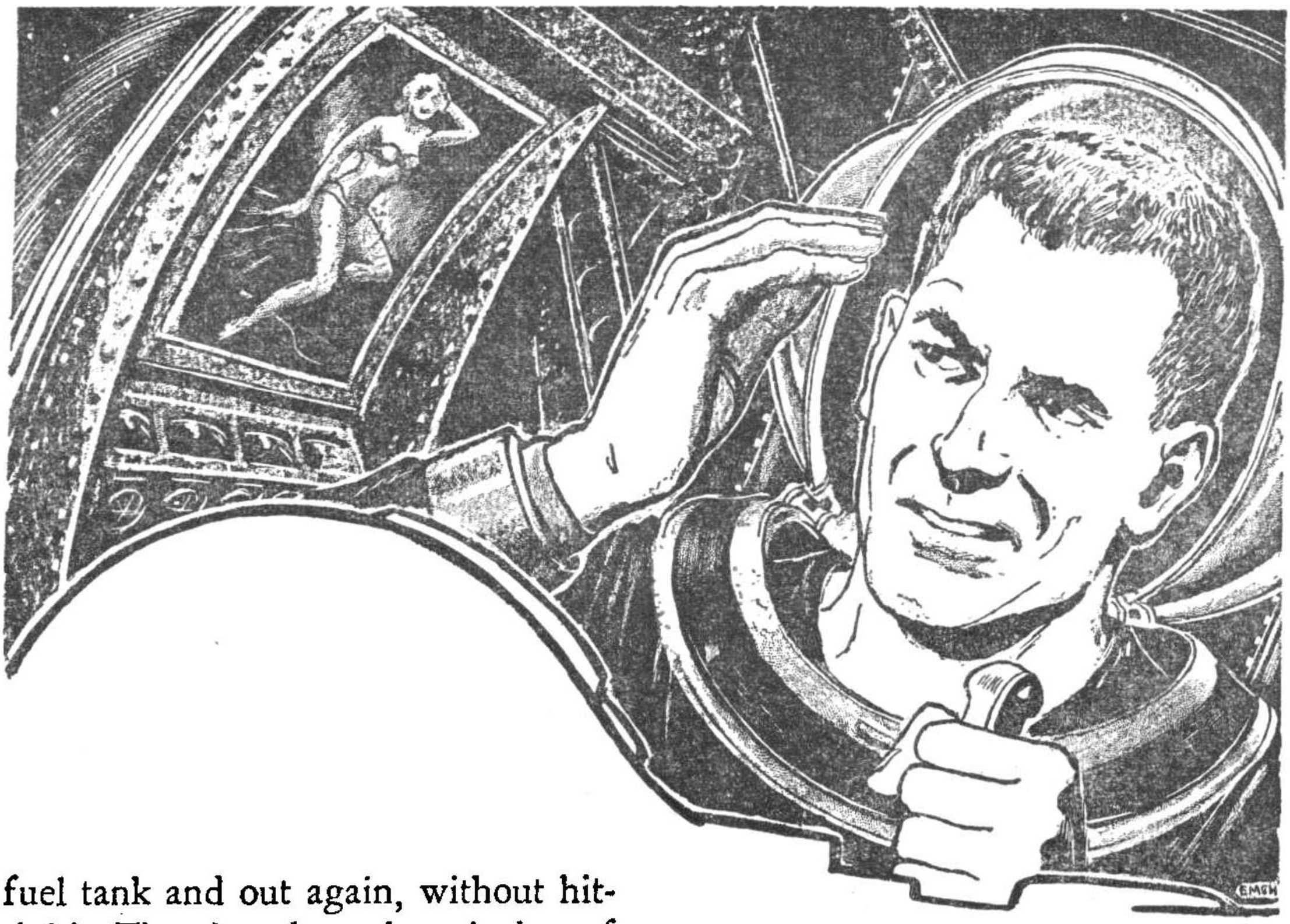
Paul was struggling with hundred-pound arms, trying to focus the telescope that swiveled over the panel. As the field cleared, he could see that the plume was flaring unevenly, flickering red and orange along one side. Quietly and viciously, he was talking to himself. "Blow! Blow!"

And she blew. Like a dirty ragged bit of fireworks, throwing tiny handfuls of sparks into the blackness. Something glowed red for a while, and slowly faded.

There, but for the grace of God. . . . Paul shuddered in a confused mixture of relief and revulsion.

He cut back to 4 G's, noting that RVS registered about a mile per second away from station, and suddenly became aware that the red light was on for loss of air. The cabin pressure gauge read zero, and his heart throbbed into his throat as he remembered that *pinging* sound, just as they passed the enemy ship. He told Garrity to see if he could locate the loss, and any other damage, and was shortly startled by a low amazed whistle in his earphones.

"If Ah wasn't lookin' at it, Ah wouldn't believe it. Musta been one of his shells went right around the



fuel tank and out again, without hittin' it. There's at least three inches of tank on a line between the holes! He musta been throwin' curves at us. Man, cap'n, this is our lucky day!"

Paul felt no surprise, only relief at having the trouble located. The reaction to the close call might not come till hours later. "This kind of luck we can do without. Can you patch the holes?"

"Ah can patch the one where it came in, but it musta been explodin' on the way out. There's a hole Ah could stick mah head through."

"That's a good idea." Johnson was not usually very witty, but this was one he couldn't resist.

"Never mind, Guns. A patch that big wouldn't be safe to hold air."

They were about eighty thousand miles out. He set course for Earth at about five and a half mps, which Johnson calculated to bring them in on the station on the "going away" side of its orbit, and settled back for the tedious two hours of free wheeling. For ten or fifteen minutes, the interphone crackled with the gregariousness born of recent peril, and gradually the ship fell silent as each man returned to his own private thoughts.

Paul was wondering about the men on the other ship—whether any of them were still alive. Eighty thousand miles to fall. That was a little beyond the capacity of an emergency rocket—about 2 G's for sixty seconds —even if they had them. What a way to go home! He wondered what he'd do if it happened to him. Would

he wait out his time, or just unlock his helmet.

Guns' drawl broke into his reverie. "Say, cap'n, Ah've been readin' in this magazine about a trick they used to use, called skip bombin'. They'd hang a bomb on the bottom of one of these airplanes, and fly along the ground, right at what they wanted to hit. Then they'd let the bomb go and get out of there, and the bomb would sail right on into the target. You s'pose we could fix this buggy up with an A bomb or an H bomb we could let go a few hundred miles out? Stick a proximity fuse on it, and a time fuse, too, in case we missed. Just sittin' half a mile apart and tradin' shots like we did on that last mission is kinda hard on mah nerves, and it's startin' to happen too often."

"Nice work if we could get it. I'm not crazy about those broadside battles myself. You'd think they'd have found something better than these thirty caliber popguns by now, but the odds say we've got to throw as many different chunks of iron as we can, to have a chance of hitting anything, and even then it's twenty to one against us. You wouldn't have one chance in a thousand of scoring a hit with a bomb at that distance, even if they didn't spot it and take off. What you'd need would be a rocket that could chase them, with the bomb for a head. And there's no way we could carry that size rocket, or fire it if we could. Some day these crates will come with men's rooms, and we'll have a place to carry something like that."

"How big would a rocket like that be?"

"Five, six feet, by maybe a foot. Weigh at least three hundred pounds."

It was five minutes before Guns spoke again. "Ah been thinkin', cap'n. With a little redecoratin', Ah think Ah could get a rocket that size in here with me. We could weld a rail to one of the gun mounts that would hold it up to five or six G's. Then after we got away from station, Ah could take it outside and mount it on the rail."

"Forget it, lad. If they ever caught us pulling a trick like that, they'd have us on hydroponic duty for the next five years. They just don't want us playing around with bombs, till the experts get all the angles figured out, and build ships to handle them. And besides, who do you think will rig a bomb like that, without anybody finding out? And where do you think we'd get a bomb in the first place? They don't leave those things lying around. Kovacs watches them like a mother hen. I think he counts them twice a day."

"Sorry, cap'n. Ah just figured if you could get hold of a bomb, Ah know a few of the boys who could rig the thing up for us and keep their mouths shut."

"Well, forget about it. It's not a bad idea, but we haven't any bomb."

"Right, cap'n."

But it was Paul who couldn't forget about it. All the rest of the way back to station, he kept seeing visions

of a panel sliding aside in the nose of a sleek and gleaming ship, while a small rocket pushed its deadly snout forward, and then streaked off at tremendous acceleration.

Interrogation was brief. The mission had turned up nothing new. Their kill made eight against seven for Doc Miller's crew, and they made sure Miller and the boys heard about it. They were lightheaded with the elation that followed a successful mission, swapping insults with the rest of the squadron, and reveling in the sheer contentment of being back safe.

It wasn't until he got back to his stall, and started to write his father a long overdue letter, that he remembered he had heard Kovacs say he was going on leave.

When he finished the letter, he opened the copy of "Lady Chatterley's Lover" he had borrowed from Rodriguez's limited but colorful library. He couldn't keep his mind on it. He kept thinking of the armament officer.

Kovacs was a quiet, intelligent kid, devoted to his work. Coulter wasn't too intimate with him. He wasn't a spaceman, for one thing. One of those illogical but powerful distinctions that sub-divided the men of the station. And he was a little too polite to be easy company.

Paul remembered the time he had walked into the Muroc Base Officer's Club with Marge Halpern on his arm. The hunger that had lain undisguised on Kovacs' face the moment he first saw them. Marge was a striking blonde with a direct manner, who liked men, especially orbit station men. He hadn't thought about the incident since then, but the look in Kovacs' eyes kept coming back to him as he tried to read.

He wasn't sure how he got there, or why, when he found himself walking into Colonel Silton's office to ask for the leave he'd passed up at his fiftieth mission. He'd considered taking it several times, but the thought of leaving the squadron, even for a couple of weeks, had made him feel guilty, as though he were quitting.

Once he had his papers, he started to get excited about it. As he cleaned up his paper work and packed his musette, his hands were fumbling, and his mind was full of Sylvia.

The vastness of Muroc Base was as incredible as ever. Row on uncounted row of neat buildings, each resting at the top of its own hundred-yard deep elevator shaft. A pulsing, throbbing city, dedicated to the long slow struggle to get into space and stay there. The service crew eyed them with studied indifference, as they writhed out of the small hatch and stepped to the ground. They drew a helijet at operations, and headed immediately for Los Angeles.

Kovacs had been impressed when Paul asked if he'd care to room together while they were on leave. He was quiet on the flight, as he had been on the way down, listening contentedly, while Paul talked combat and women with Bob Parandes, another pilot going on leave.

They parked the helijet at Municipal Field and headed for the public PV booths, picking up a coterie of two dogs and five assorted children on the way. The kids followed quietly in their wake, ecstatic at the sight of their uniforms.

Paul squared his shoulders, as befitted a hero, and tousled a couple of uncombed heads as they walked. The kids clustered around the booths, as Kovacs entered one to locate a hotel room, and Paul another, to call Sylvia.

"Honey, I've been so scared you weren't coming back. Where are you? When will I see you? Why didn't you write? . . ." She sputtered to a stop as he held up both hands in defense.

"Whoa, baby. One thing at a time. I'm at the airport. You'll see me tonight, and I'll tell you the rest then. That is, if you're free tonight. And tomorrow. And the day after, and the day after that. Are you free?"

Her hesitation was only momentary. "Well, I was going out—with a girl friend. But she'll understand. What's up?"

He took a deep breath. "I'd like to get out of the city for a few days, where we can take things easy and be away from the crowds. And there is another guy I'd like to bring along."

"We could take my helijet out to my dad's cottage at—*What did you say?*"

It was a ticklish job explaining about Kovacs, but when she understood that he just wanted to do a friend a favor, and she'd still have Paul all to herself, she calmed down. They made their arrangements quickly, and switched off.

He hesitated a minute before he called Marge. She was quite a dish to give up. Once she'd seen him with Sylvia, he'd be strictly *persona non grata*—that was for sure. It was an unhappy thought. Well, maybe it was in a good cause. He shrugged and called her.

She nearly cut him off when she first heard his request, but he did some fast talking. The idea of several days at the cottage intrigued her, and when he described how smitten Kovacs had been, she brightened up and agreed to come. He switched off, adjusted the drape of his genuine silk scarf, and stepped out of the booth.

Kovacs and the kids were waiting. The armament officer had apparently been telling them of Paul's exploits. They glowed with admiration. The oldest boy, about eleven, had true worship in his eyes. He hesitated a moment, then asked gravely: "Would you tell us how you kill a Red, sir?"

Paul eyed the time-honored weapon that dangled from the youngster's hand. He bent over and tapped it with his finger. His voice was warm and confiding, but his eyes were far away.

"I think next we're going to try a slingshot," he said.

THE END

NEW MOONS

BY R. S. RICHARDSON

Before we put that space satellite up there—we've got to find out what's already there, and work out how small a satellite would be accurately visible, and a few dozen other minor—but critical!—points.

Some years ago it occurred to me that in our preoccupation with manned space flight we might be overlooking some handy uses to which the rocket might be put that are not so depressingly far in the future. For example, it would be a great help to dynamical astronomy if Venus had a close satellite, which would enable us very quickly to get an accurate determination of the planet's mass. Since Nature had been negligent in this respect, why not take matters into our own hands and GIVE Venus a satellite?

The idea burst upon me shortly after the announcement about the atomic bomb when practically anything seemed possible. I decided to write up the idea as if it had actually happened in the same serious matter-of-fact style as the Smythe report on "Atomic Energy for Military Purposes." The result was "The Aphrodite Project"* which related among other things how a rocket had been dispatched to Venus in such a way as to be captured by the planet and converted into a satellite. An automatic timing device released a cloud of dense white gas which could be easily observed from Earth. As soon

*Astounding Science Fiction, June, 1949.

as its period of revolution and mean distance from Venus were determined, the mass of the planet could be calculated by simple arithmetic from the exact statement of Kepler's third law as given by Newton.

Somewhat to my surprise many people accepted the article as fact with results that proved rather awkward in certain cases. The public relations man at the California Institute of Technology informed me later that the Associated Press had called him wanting to know why he had been holding out on them. And a student at Harvard wrote requesting the number of the government bulletin in which the full three-hundred-page report was printed. Ironically enough the individuals who swallowed the article whole were mostly engineers and scientists, the very ones who should have known better. The science-fiction fans, generally, saw through the fabrication, which seemed quite transparent to me.

Speaking seriously, however, it would still be helpful if Venus had a satellite. It would also put us ahead about a century if a companion could be found for Pluto. For satellites not only give us valuable clues to the evolution of the solar system as a whole, but also furnish us with information about the individual planets which we can obtain otherwise with only the geatest difficulty. Perhaps the most useful satellite we could discover would be a small close companion of the Earth revolving within a few thousand miles of the surface, a ready-made space station waiting for us to take over. Now searching for satellites operates on much the same principles as hunting for a husband or prospecting for uranium. You've got to get out and exert yourself. How do we know that Venus has no satellite? Has anyone looked real hard for one lately? Unfortunately, few astronomers are interested or qualified for this type of investigation, which requires skill and patience as well as special observing equipment. In the last ten years, however, three new satellites have been added to the solar system which indicates that this field is by no means exhausted. Let us look at some of the problems that face the astronomer who goes off in quest of new moons.

It is reported that when Asaph Hall was asked why he undertook a search for a satellite of Mars in 1877, he answered that it was because he was tired of reading in the textbooks that "Mars has no moons." Hall was well aware that others before him had searched for a satellite of Mars in vain. But the year 1877 seemed especially favorable for such a search. The planet was scheduled to come within thirty-five million miles in August, the closest approach in thirty years. Also, the Naval Observatory where Hall worked had just installed a fine 26-inch refracting telescope.

Hall began the search early in August, first sweeping at a considerable distance from Mars and gradually working inward. By August 10th he was scanning the region so close to the planet that the glare from the

disk interfered with observations. On the next night conditions were so poor that he closed up the dome and went home feeling further work was useless. But his wife urged him to return for one more look to which he reluctantly agreed. After searching for only a few minutes he found a suspicious looking object, but barely had time to measure its position before a fog came in from the Potomac River putting an end to observations that night for good. When Hall resumed work about a week later he not only found the object he had seen before (Deimos), but another one (Phobos), that moved with such bewildering rapidity that at first he thought Mars must have several inner moons.

The discovery of two tiny bodies revolving within only a few thousand miles of Mars aroused great popular and scientific interest. But Phobos and Deimos are not merely celestial curiosities. For after a few days of observation Hall was able to get a very accurate mass of Mars. Thus in perhaps thirty minutes of actual calculation he obtained a better value for the mass than Leverrier had been able to derive from the labors of a corps of computers on observations extending over a century.

It is curious that once the satellites were discovered other observers had no trouble seeing them, too. Of course, for such elusive bodies as Phobos and Deimos it is a big help to know exactly where and when to look. In the summer of 1954 while taking photographic observations of Mars with the 100-inch telescope on Mount Wilson, I often looked for the satellites in the guiding eyepiece but without any luck. Evidently the only hope of catching them is when they are at elongation; that is, at their greatest distance east or west of the planet. But this can hardly be the whole explanation. There seems to be a psychological block involved as well. Thus E. E. Barnard, writing of his discovery of Jupiter V in 1892, remarked that it was much more difficult to see than the satellites of Mars, and doubted if it could be discerned with a telescope of less than twenty-six inches aperture, and then only under first-class seeing conditions. Yet only a month later Jupiter V was readily seen by some visitors at Princeton with the 23-inch telescope there. The same situation seems to hold in scaling mountains and breaking athletic records. Once someone has done it others soon follow.

Not only does a satellite give us an accurate determination of the mass of the planet around which it revolves. It can also be made to give us information about the distribution of mass within the planet. The rotation of a planet causes it to be bulged at the equator and flattened at the poles. This means that a satellite revolving in an orbit inclined to the planet's equator will be moving in a gravitational field of nonuniform intensity, which is not inversely proportional to the square of the distance. The general result is to change the

orientation of the orbit in space. If the equatorial bulge can be measured, its effect on the orbit of the satellite can be calculated. Or we can work the other way around, and find the equatorial bulge from the change in the orientation of the orbit.

One of the most interesting examples occurs in the case of Mars, whose equatorial diameter exceeds its polar diameter by twenty-five miles. This value for the Earth is twenty-seven miles. But since Mars is about half the size of the Earth, the planet's *oblateness,* or the amount it is bulged relative to its diameter, is twice that of the Earth. At first sight this seems rather surprising since Mars rotates a little slower than does the Earth. But it can be shown that the Earth is not so oblate because of its higher density and its dense central core. Apparently Mars has no dense central core but is nearly uniform in composition from center to surface. The fact that Mars does not have a central core indicates that the planet was not completely molten when formed.

At present the masses of Mercury, Venus, and Pluto can only be determined by their disturbing effects on other planets. But since their distances from other bodies are so large and their masses so small, the disturbing effects they produce are scarcely appreciable except over long intervals. Only recently has it been possible to obtain a fairly reliable value for the mass of Mercury. Apparently the first rough measure of the mass of Mercury was made from the close approach of Encke's comet in 1842. The uncertainty in the mass of Mercury is shown by the fact that in 1950 it had to be upped twenty per cent, a result obtained incidentally from observations of Eros.

From small irregularities in the motion of Uranus and Neptune the mass of Pluto appears to be about the same as that of the Earth. The diameter of Pluto determined from observations with the 200-inch telescope is 3,680 miles. But if these values are correct then Pluto has a density ten times that of Earth or fifty-five times that of water. Evidently something is wrong somewhere. It seems incredible that Pluto can have such a high density. Either its mass is too big or its diameter is too small, or both are in error. To get a better value for the mass, however, we will have to wait for possibly a century for the perturbations of Uranus and Neptune to accumulate—unless we can discover a satellite for Pluto.

The mass of Venus is much easier to determine than that of Mercury or Pluto, but there is still room for improvement. From a discussion of ten thousand observations of Mercury from 1765 to 1937, G. M. Clemence of the United States Naval Observatory concludes that the mass of Venus is 1/400,000 that of the Sun. Other astronomers from the disturbing effects of Venus on Earth have gotten a value of 1/407,000. Thus the true mass of Venus is about 1/408,000 that of the Sun, or 0.8088 the mass of the Earth.

Well . . . what are the prospects of finding satellites of Mercury, Venus, and Pluto?

Obviously not very good. But the discovery by Kuiper of a close companion of Uranus in 1948 and a distant satellite of Neptune in 1949, besides the discovery of three satellites of Jupiter by Nicholson since 1938, indicates that it is not completely hopeless, at least.

It is interesting to see how much we can do toward narrowing the field of search before we ever go near the telescope itself. For example, one question that immediately presents itself is how far out to search from the planet? It can be shown from certain general results based on the law of gravitation that there is a certain limit beyond which it is useless to look, for it would be impossible for a planet to hold a satellite at such a distance. This result follows from a discussion of the three-body problem, when one of the bodies is of infinitesimal mass. Although a general solution of the three-body problem has never been obtained, yet it is possible to show that an infinitesimal can move in certain regions and is excluded from others. Thus it can be shown that the Moon cannot recede indefinitely from the Earth.

These limiting distances for the planets have been calculated and are given in Table I, together with the periods that such hypothetical satellites would have. It is seen that there are still vast regions where undetected satellites might revolve even in the case of planets with extensive satellite systems.

Let us consider first the possibility of finding a satellite of Pluto. This

TABLE I

Distances and Periods of Hypothetical Satellites

PLANET	MAXIMUM DISTANCE (MILES)	PERIOD (DAYS)	OUTERMOST KNOWN SATELLITE (MILES)	NAME
Mercury	138,000	63	.....	.....
Venus	627,000	129	.....	.....
Earth	927,000	210	239,000	Moon
Mars	673,000	395	14,600	Deimos
Jupiter	32,300,000	2420	14,700,000	JIX
Saturn	39,900,000	6076	13,000,000	Phoebe
Uranus	43,200,000	17500	365,000	Oberon
Neptune	71,600,000	34283	5,800,000	Nereid
Pluto	22,900,000	25713	.....	.....

is obviously a project for a large reflecting telescope. Pluto itself is so faint that a telescope of about seventeen inches aperture is needed to see it. Suppose that Pluto has a satellite that reflects light like the surface of the Moon. Then, at the mean distance of Pluto, the size of the satellite corresponding to different magnitudes is shown in Table II.

TABLE II

Size of a Satellite of Pluto for Different Magnitudes

MAGNITUDE	DIAMETER
17	1600 miles
18	1000
19	630
20	400
21	250
22	160

The best measure for the diameter of Pluto makes the planet 3,680 miles. Its satellite presumably would be much smaller. It seems unlikely that it can be much brighter than the twentieth magnitude. I believe the limiting magnitude of the 200-inch is about the twenty-third, but it must be remembered that you cannot attain this every night, depending upon the seeing and transparency of the sky. To be detected with present optical equipment it would seem as if a satellite of Pluto would have to be at least two hundred miles in diameter. Also, a close satellite could not be detected as its image would be blended with that of Pluto's.

When we turn to Mercury and Venus the main difficulty is their proximity to the Sun. Although these bodies come within less than an astronomical unit of us, searching for a satellite in their case is as bad or worse than for Pluto. During the last six months I have been working on Venus with the 100-inch telescope, photographing it through an ultraviolet filter which shows markings on its surface very seldom seen visually. I can personally testify that trying to get Venus is enough to give any observer the jitters. In southern California we not only have the sun to reckon with but also the light from atomic bombs flashing along the horizon at dawn. The difficulties that confront us in the case of Mercury are so formidable as to rule this planet out at the very start. Therefore we will confine our remarks entirely to Venus.

In the Seventeenth and Eighteenth centuries observations of a satellite of Venus were of fairly common occurrence. Thus from 1645 to 1768 there were a dozen astronomers who observed an object they claimed might be a Venusian satellite. (In one instance the diameter of the satellite was a third of that of Venus!) These observations were collected and discussed by Paul Stroobant of Brussels in 1887. He found that in most instances the "satellite" could be explained by a fixed star near the planet. The others were almost certainly optical illusions. As more and

better telescopes became available it might be supposed that the number of Venusian satellites would increase accordingly. On the contrary, a cursory search of the literature indicates that no one has discovered a satellite of Venus for more than a century.

Astronomers have usually preferred to observe Venus in full daylight when the glare of the disk is reduced, and the image not so disturbed by air currents as when near the horizon at night. But it would seem hopeless to search for a faint satellite against the sunlit sky. We therefore would seem to have no choice but to observe before sunrise or after sunset when the planet is at a low altitude.

Since the satellite will show the same phase as the planet, the best time to search would be when Venus is at maximum brightness. This occurs about thirty-six days from inferior conjunction when the planet passes between the Sun and Earth. At maximum brightness Venus shows a crescent phase like that of the Moon when five days old. We will assume again that the satellite reflects light like the surface of our Moon. We can then assume different magnitudes for the satellite and calculate the diameters corresponding to them. After allowing for the phase the diameters of hypothetical Venusian satellites corresponding to different magnitudes are given in Table III. (Readers are warned not to take these diameters too seriously. They involve various assumptions which may give results that are badly misleading.)

Phobos and Deimos are of about magnitude 12.6 and are estimated to be seven and five miles in diameter, respectively. Jupiter V is magnitude thirteen and its computed diameter is one hundred fifty miles. From Table III it seems unlikely that Venus can have a companion more than fifty miles in diameter without having been discovered by this time. I mean *really* discovered.

The satellite should be easiest to see when at elongation, when it appears farthest from the planet out of the glare surrounding it. Suppose that the search is confined to ten

TABLE III

Size of a Satellite of Venus for Different Magnitudes

MAGNITUDE	DIAMETER	MAGNITUDE	DIAMETER
10	44 miles	16	2.8 miles
11	28	17	1.7
12	17	18	1.1
13	11	19	0.7
14	7	20	0.4
15	4.4		

days before to ten days after the date of maximum brightness. At this time Venus is about three hours from the Sun. Now you may not believe it but an observer will be mighty lucky if he has a full hour when he can work to advantage. BUT unless the satellite happens to be near elongation when he happens to be looking at this hour he may never see it.

A technique that has been used successfully in photographing the faint Jovian satellites is to move the plate at the same apparent rate and in the same direction as Jupiter. The images of the stars in the field are drawn out into lines. But the images of the satellites build up during the exposure and hence are slightly stronger than if the plate followed the stars as is usually done.

A difficulty arises when the satellite happens to be so near the planet that its image also falls on the plate. Thus during the exposure of an hour the image of Jupiter is liable to build up until it spreads over the plate blotting out the faint satellite altogether. This blackening due to internal reflection within the glass plate or halation may be reduced by sticking a piece of felt on the emulsion at the point where the image of Jupiter falls, and by using plates that are backed. This device is not so effective as might be supposed, however, since most of the blackening comes from light scattered and diffused from the telescope mirrors rather than from the direct light of the image. Search for a satellite of Venus

TABLE IV

Periods of Venusian and Terrestrial Satellites for Different Distances from Primary

DISTANCE FROM CENTER OF PLANET	PERIOD OF A VENUSIAN SATELLITE	PERIOD OF A TERRESTRIAL SATELLITE
10,000 miles	0.26 days	0.24 days
20,000	0.74	0.67
50,000	2.92	2.63
100,000	8.27	8.18
200,000	23.39	21.03
239,000	30.55	27.47

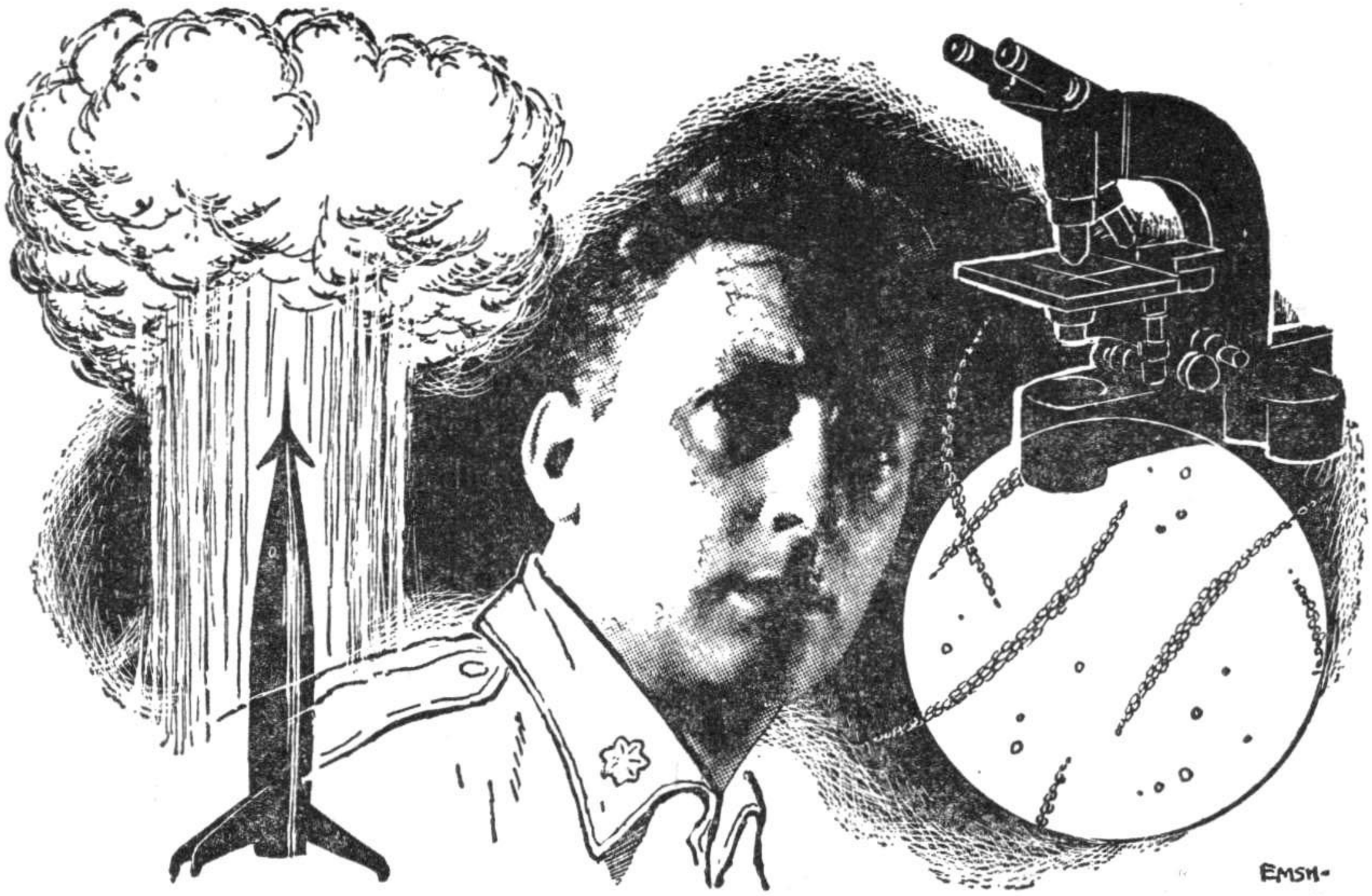
would be complicated not only by the great brightness of the planet but also from fogging from the twilight sky. Perhaps a return to old visual methods might be better. And the fact remains that three of the most elusive satellites in the solar system were discovered in this way.

Owing to the smaller mass of Venus the period of a satellite revolving around it will always be less than that of a small terrestrial satellite revolving at the same distance, as shown in Table IV. (The period of a satellite also depends upon its own mass. In most cases it is infinitesimal but there are exceptions.)

From the last entry it is seen that a Venusian satellite revolving at the distance of our Moon would have a period of about one month. The period of rotation of Venus is unknown but from a discussion of all results, F. E. Ross in 1927 deduced a "compromise period" of thirty days which has been widely quoted. If the period of rotation were exactly thirty days, then a satellite revolving around Venus at the distance of our Moon would have a period equal almost exactly to the length of the planet's day. An observer on Venus would see the satellite hanging nearly motionless in the sky—assuming that observers on Venus can ever see the sky.

Finally, readers may be interested to know that a search for another satellite of the Earth is actively under way at present. This project is classified and no results are available as yet. One of the most interesting features of the work is the way the telescope is operated. Telescopes are turned normally at the sidereal rate so as to follow the stars from east to west across the sky as closely as possible. But this telescope runs at rates quite different from the sidereal. It can even run from west to east if desired. Whether a second satellite is revealed or not the results should make very interesting reading when published.

THE END



THE OUTVADERS

BY JOE L. HENSLEY

If some alien seeks to force his way in, to invade your domain, you can do something fairly definite. But there's a different kind of problem that could be rougher . . .

Illustrated by Emsh

The corporal flipped the Geiger counter down at the brown, sandy earth. "Not even warm now," he said disappointedly.

"It was once," the sergeant said. He pointed out to the bowllike center of the valley. "The first Americans to ever die in an atom blast died right out there. I remember reading the stories in the papers. These two officers—one of them was a flier—the other a doctor. They'd both been just discharged from the hospital and I guess they drove out here to see the

test and blundered right up over that hill over there when the plane was dropping the bomb."

"Stupid," the corporal said.

It is not a good thing to see a man die.

Dr. Manuel Guitterez tucked the plastic cover of the oxygen tent in more closely. It made a crinkly noise as he touched it with careful hands. The only other noise was the slight hissing of the oxygen pump.

The eruptions were now growing so fast that the doctor could almost watch their progress. They had appeared only hours before, but they had already reached immense size all over the head and body of the man on the bed.

Dr. Guitterez shook his young and graying head. He was a diagnostician and had seen many men die. Yet each time, since the first time when he had waited while his brother and sister were lowered into the hot, dry earth, it was as if he died a little too.

Unconsciously the doctor touched the oak leaf major's insignia. A long way. A long, long way for a kid that had hated the filth of the Texas-Mexican border town he had been born in; a boy who had hated the fear, the disease, and the dead. His sister and small brother in the influenza epidemic—how cold and small and fearsome they had been in the cheap pine boxes. He remembered those days now, but only vaguely, as in a dream. Then afterwards, school, where all his time must be spent in making enough money to pay the tuition and feed himself once in a while. No dances, no friends.

The oak leaf was loose. He pinned it tight again.

But something had made up for it. He had found another world—the world under the microscope. A world to hate and fear and be fascinated by and after a while, dimly understand. A world of teeming life and sudden death. A world that had caused the deaths in his family and so dedicated him and made the things beneath the eye of a microscope personal to him. Shining retorts on a shelf, the sound of a centrifuge whirring softly in the background—these made up for the things he had lost or never had.

And now there was Mary, his wife, who understood at least partially what drove him.

"You're too dedicated," the colonel said once. The doctor had laughed, but only a little. And Mary had laughed very little when the doctor told her.

But that was why he was here—why he had been chosen.

The colonel looked for a fool and there was only I.

He jerked his mind away from that sort of thing and felt for the pulse of the dying man. It was weak and thready and the count was very fast. It would be soon now. The doctor said a prayer.

He stood up out of the light metal chair. There was a twinge in his back. It had been there for almost three days now—perhaps from too much sitting—perhaps from some-

thing else. *Mary, my wife, will I see you again?*

He went to the porthole of the spaceship. It was growing light outside. To the right of the ship, just in view, stood the truck that had carried him out here alone, with the supplies for his portable laboratory. That had been on the day that the spaceship landed. The truck would wait there until he was ready to return. He had carried the supplies and equipment into the ship alone—a hard two hours' work.

A mile away he could see the big, hastily erected fence. The guards walked there with backs resolutely away from the ship that was the center of existence. They had orders to shoot anyone who came inside the fence; they had orders to shoot him if he tried to come out of the ship.

He smiled a little, thinking about that.

It was the dying man on the bed he should be feeling sorry for, not himself. One chance for fame, a chance that no one had ever had. To be the first; to pilot this huge piece of jewel-like machinery, this spaceship, up into the sky alone and be a new Columbus, a greater Lindbergh.

Go to the Moon and return.

You build a ship . . . you take a volunteer. You listen to the roar of thunder at blast-off and the clicking of the machines as they track the ship up and up. For a time you wait. Then one day your ship and your volunteer come back and you think you have won. But what if the volunteer is ill of an unknown disease? Perhaps the disease is contagious and deadly. Another volunteer, then—a doctor.

At 0800 the doctor called his colonel at the mobile hospital.

"Hello, Bill," he said.

He could almost feel the nervous movement on the other end of the line. The colonel said: "I wish you wouldn't do that. There's a million tons of brass around and you call me by my first name."

The doctor laughed a little. "I'm sorry, colonel. Maybe you should come out and discipline me." He liked Colonel Williams. The man was a doctor first, human second, and big wheel army near the bottom of the list.

There was a pause—perhaps a moment of not wanting to know, not wanting to ask the inevitable. "How's the patient?" the colonel asked finally.

"He is very low. He will die, colonel, probably today. His temperature at 0730 was 105.6, rectal; pulse 150; respiration very shallow, about 32. He is unconscious and his pupils react only slightly to light. I gave him a thousand cc's of glucose about 0600, intravenously. His skin has started to blotch and erupt. I took some specimens of the discharge, but haven't had a chance to look at them yet. I ran some more blood tests last night, red blood count still up and white count almost nonexistent, some change in the differential." He read the exact information off and then had the colonel read it back to check.

"You still don't think it could be simple radiation?" Williams asked. "That fuel he was using was radioactive."

"Not a chance unless it's something in radiation we've never run into before. Just doesn't act like it. The only similar symptom is the white count drop."

"All right, Manny. Watch yourself." The colonel's voice became forced as he asked the question that custom and the surgeon general required: "You're still wearing your mask and suit?"

The doctor looked over at the wall where the mask and suit hung—and had hung for several days. "Of course. You know me—old sterile Manny Guitterez."

You can't find out if a disease is contagious in a sterile suit.

"Your wife called," the colonel said.

"Mary?"

"She still thinks you're on the isolation ward with scarlet fever." The colonel paused and laughed. "I gave her my love. You can give her yours when you see her."

The doctor smiled. "I will do that," he said.

"Some of the doctors said to say hello—some of the nurses, too."

That was a lie, the doctor thought, but a nice one, a friendly lie. "Yeah," he said, "tell them hello for me."

There was nothing more to say.

The doctor climbed back down into the compartment that he used for a makeshift laboratory. The pilot had jettisoned much of his equipment on the moon to lighten his return load. There was plenty of room on the ship now.

The specimens he had taken from the eruptions were waiting. He put them under the microscope and dialed in on the first of them. The slide was loaded with leucocytes, white cells. No wonder the white count had dropped in the body. But he had never seen them in formations like these. Instead of moving as single entities these clung together in columns with measurable depth and height and width. They towered off the glass slide like tiny hills; they moved together like a marching band. The white cells; the germ fighters; the little Galahads of the body—what was it they were fighting now? Whose gauntlet had they eagerly picked up? They seemed healthy enough. He stained a few for a later look.

At about 1400 the pilot died quite quickly and easily. One moment he was breathing, the next, he was not. Dr. Guitterez went through the necessary medical attempts to breathe life back into the thing on the bed. They were of no use.

At 1422 he called the colonel again.

"He's dead, colonel." He put one hand over his eyes while he waited for the man at the other end of the line to say something. The late afternoon sun was striking him directly in the face through the control room porthole, aggravating his slight headache.

"All right, Manny. I'll tell them."

He could hear a rustle from the other end, probably as the colonel covered the speaker with his hand. Then the indistinguishable sound of conversation. The doctor strained his ears, but could make out none of it. Finally the hand was taken away. "Manny," the colonel said. "Manny? Are you still there?"

"Yes," the doctor said.

"You'll have to stay out there for a while," the colonel said hesitantly. "If you don't think you can handle it alone, we can ask for more volunteers."

The doctor thought about it. "I can handle it," he said carefully.

"All right, but be careful." Then, as if it were something he had just remembered, the colonel said: "It might be contagious."

"Yes, it might be," the doctor said softly. "I'd thought of that."

His back ached. He set the ship's log on the desk and stood up to stretch. The ache persisted. That was how it had started with the pilot, too— A simple backache.

"I think I must have strained something in the take-off from the moon," the logbook said. But it was not a strain, not a pulled muscle. Twenty-one days under conditions that man had never known before. It might be anything.

The doctor rubbed together hands that had grown cold, but no heat came. The autopsy had been performed, the samples taken, the tests run. Negative—everything was negative. Of course when the white cells diminished there was bound to be an increase in some types of bacilli and resulting secondary infection. But what was the prime cause? There was no primary infection in the body where the white cells had rushed in combat. But they had fought something.

The results had been phoned in. Other diagnosticians had checked his own non-diagnosis.

The real questions, he thought, are very simple. Did the pilot die of a disease? If so—is that disease contagious? And no one could know—for a while. But if the answers to both questions are yes then that makes for a very dangerous situation.

He read the dead pilot's writing in the logbook again. A backache, sudden onsets of double vision, then extreme nerve and muscle pains over the entire body.

Coma and death.

The doctor held out his own hands and looked at them. *They still counted two.*

He went back to the laboratory slowly. The answer was there somewhere—somewhere in that group of tests he had run or in the symptoms he had observed in the dying pilot. He turned on the bright light of the microscope and bent down over the stained slides.

Once again the feeling of half wonder and half repulsion came to him—as it always did when he was alone and at a microscope. There was another world down there—now still with the stain of death. A world that fought and died and sometimes

doomed the man that was its environment in its unceasing battle with itself.

The wormlike clusters of white cells interested him. They offered a partial clue, a hint of something different. Something had made them into those formations. The stain that preserved the slide had forced them back down, but not completely broken them up. There seemed fewer than before—

The stain had dried unevenly and there were tiny pressure cracks in it.

Suddenly the scene below blurred and moved. He jerked his eyes away and sat there trembling and cold. But it seemed to be only a momentary muscle spasm from too long over the microscope.

And yet, in that moment, he truly realized that he might die. Whatever had killed the pilot might very well be contagious. The sureness of personal invulnerability vanished from the doctor's mind and a good deal of his courage with it. The taking off of the mask and sterile suit had been a fool's trick. He could not have been called a coward if he left them on—in fact his orders were to leave them on. Not that the mask and suit were infallible, but if the disease were communicable they might have protected him. He could have had them send someone out to play guinea pig instead of being one himself. The pilot was dead. And what does a doctor ever know? What is a doctor ever sure of?

You stupid volunteer!

The feeling passed and his hands steadied. But he could not bring himself to look back down through the microscope.

He was climbing up the ladder to the control room when the first spell came upon him. It left him hanging with all his strength gone, vision blurred, and mouth dry. He stood weakly apart from himself and watched his own symptoms. When the spell had partly passed he went slowly on up the ladder. He sat in the heavily padded pilot's chair and put his aching head down. It was a time for praying; it was late afternoon. Outside, far away, the guards tramped on unseeing. A gust of warm wind blew rasping swirls of sand against the porthole.

He called the colonel.

"Bill," he said. "I'm down with it."

There was a silence, then: "I'm sorry, Manny," the colonel's voice said softly.

The doctor felt desperation rise up in him like waves on a wind-swept lake. "I want some time, Bill. I know that they have to de-contaminate as soon as possible—now. But I want some time. Maybe I can find out what it is."

"Are you sure it's the same thing he had?"

The doctor forced himself to relax. "No, I'm not sure," he said softly. "I'm never sure."

He heard the colonel sigh on the other end of the line. "You can have all of the time you need," the colonel said. "Call in every four hours until

you're sure. I'll hold them. But if you don't call—" He left it unfinished and the doctor supplied the meaning.

The doctor re-hung the phone. For a little while he sat in the soft chair, unable to force himself to move. Then, finally, he got up and shuffled down the ladder to his laboratory.

The Big Hate was upon him. The hate he felt as a doctor and as a man for the unknown. The pine box hate. The hate and the fear.

He turned on the hot little light of the microscope. Gingerly he drew samples from his own body for comparison with the ones of the dead pilot.

He took off his watch, wound it, and placed it carefully on the laboratory table. He set a clock-timer so that it would ring every hour in case he fell asleep. Then he began to stain, to centrifuge, to peer at the results under the microscope, to compare.

Three times he climbed painfully up the ladder to call. Night turned to day outside. They had withdrawn the guards. Only the gray face of the desert and the lonely wire fence stared back at him from the portholes of the Moon ship.

Put a man in space—make him vulnerable to all the things out there: The radiation, the weightlessness of free fall, the tearing surges of take-off and landing. He will live perhaps. But things inside him, things that reproduce fast—what will happen to them under space conditions? What if just one thing mutates from radiation?

With something like fascination the doctor watched the eruptions appear on his body. He feared to touch them for they were a symbol of his own uncleanness. At first they were small freckles, slightly raised, as if the sun had struck fair skin, though his skin was dark. Then they began to bloom. He waited for them to come to full flower.

He was not as sick as the pilot had been, probably because he had not had to bear the terrific gravitational pressure of landing the ship. But his temperature rose and rose and no antipyretic seemed to help. He felt very hot and fuzzy.

He got out the white cell slide he had made from the pilot's eruptions and put it under the microscope again. Soon there would be something to compare it with. Curiously he bent down to give the slide another look.

What he saw brought alertness back into his tight and fevered mind.

The microscope showed nothing.

The stain was there all right, but now completely broken and cracked. The swarms of leucocytes that should have been imprisoned and dead beneath it were gone.

Frantically the doctor checked two similar slides he had made. One was like the first. On the other the stain held, but he could see almost imperceptible movements in the wormlike clusters of white cells beneath the stain as, dying, they still fought to break through it.

When his own evil flowers began to blossom he took specimens and

put them under the microscope. His aching eyes burned and blurred.

Now he knew what the formations had reminded him of when he had first seen them—tiny projectiles, needle nosed, curved to give the least resistance to the liquids and solids of the body they were traveling through.

There had been no primary infection. It was something in the cells themselves. They had gone wild. It was like cancer, where a cell group goes wild. But these cells could move and they were more resistant to temperature change than normal. That meant they could move from body to body.

The doctor began to make tests on the slides below him.

Getting up the ladder for the last time was hell. His joints had begun to swell and stiffen as secondary infection set in from the lessening of the white count. Climbing was a slow process of getting both hands hooked into the rung above and dragging himself up. His legs seemed dead beneath him. Twice he fell back. But his four-hour period was nearly up and the colonel must be told. On the third try he made it to the control room above and the telephone.

"It's the white cells," he told the colonel. "Maybe something in the radiation mutated them, maybe some sort of a spore the pilot picked up on the moon that conceal themselves as white cells and can't be distinguished from them. My guess would be the first. The white cells can't protect themselves from the changed ones—the mutations live on them, eating them. They've lost their function in the body—grown tough enough to live outside it for a while when all the white cells in a host body are gone."

The colonel said something, but the doctor could not make out what it was. He disregarded it. He touched his hot forehead. "They can't have gotten out of the ship: They move slowly and I've had it sealed since I came aboard. But you'd better hurry to make sure. Antiseptics won't kill them, nor will antibiotics. But heat will—lots of heat." He laughed shakily. "That works out right, doesn't it?"

They were saying something on the other end of the line, he realized. It was not the colonel, it was a rough voice—a command voice. He did not care. He was weak and tired. Let them do the work now—they had the clue. Let them find out. Maybe they could find some way to protect the next man from radiation and the cannibal change. Or maybe God meant man for only one planet.

That was their problem. His problem was over for he had won—he had found the answer.

He smashed the phone against the control panel of the rocket until all sound stopped. Then he let it fall to the deck.

Get out once more in the clean desert air. No! No—I can't do that. He touched his hot head wtih his hot hands. *I have lost for I will die.* But he knew he had not lost, but won, for the disease died with him.

He went to the side porthole of the control room. He unloosened his belt and cinched it around a wall girder so that he might stand erect. He thought dimly of Mary, his wife, and said a prayer for her.

He knew what they were going to do. They had planned it all along—if something went wrong. Millions of degrees of heat—in a little while. He was curious about that and almost eager to feel the hotness that would make him clean again. No cheap pine box and dirty ground.

He wondered what the colonel would tell Mary. Nothing, probably. You don't tell them when you've made a mistake. You make up a plausible lie and you label the real story secret until long after the danger is past. Too much danger of panic if you let the truth be known. You correct the defect—and forget and ignore the mistake.

He touched his head again, pushing his hair back from his eyes. Looking through the porthole was like looking through the eyepiece of a microscope.

There would be bright light to see by—for a moment.

The corporal caught a glimpse of something shiny on the bare ground. He picked it up and held it in front of the Geiger counter. The clickings increased and the corporal dropped it hastily.

"Looks like a piece of wire," he said to the sergeant.

The sergeant grinned.

From far away at the Moon-Rocket Base there came a roaring sound and a rush of light as a great radiation armored ship took off. Both men stood watching until the sight and sound had faded away.

The corporal dug at the sand with his toe. "Them officers must have been pretty stupid."

The sergeant nodded. "They ain't a one of them smart enough to do anything without an enlisted man holding his hand."

THE END

THE ANALYTICAL LABORATORY

We're pressed for space, so the Lab is simply the figures this time:

PLACE	STORY	AUTHOR	POINTS
1.	Call Him Dead	Eric Frank Russell	1.47
2.	Judgment Day	L. Sprague de Camp	3.13
3.	Victory	Lester del Rey	3.16
4.	Pagan	Algis Budrys	3.44
5.	Feeding Time	James E. Gunn	4.61

THE EDITOR.

THE REFERENCE LIBRARY

BY P. SCHUYLER MILLER

CROQUET PLAYERS

I've given you before, I think, my lamentations on the unevenness of Donald Wollheim as an editor of anthologies. Some have been an utter waste of time—his and his readers'. Others, like "Terror in the Modern Vein" which he has just assembled for Hanover House (315 pp.; $3.95), are excellent. The seventeen stories he has assembled here are in large part fantasies, and I waited for the appraisal of my usual fantasy-prescriber, Anthony Boucher, before picking it up myself. But Wollheim's introduction presents a point of view about fantasy, and his choice of stories illustrates another, which I think explains how such magazines as *Unknown* came to be and why they perish.

As for the book itself, to me it doesn't justify its name any more than Groff Conklin's "Science Fiction Terror Tales," published about the same time as an original Pocket Book collection, could do. The only momentary brush of a cold wind that I got from the book was from Ray Bradbury's "The Crowd." The rest —all of them—I enjoyed reading, or rereading, and I think you will, too. But it's an intellectual enjoyment, not

terror. To lift a tremendously effective sequence from the early part of Robert Bloch's "The Dream Makers," I'm not living the climax of Lon Chaney's "Phantom of the Opera." I'm enjoying the directorial touches in one of that series of adult terror pictures Val Lewton produced and Jacques Tourneur directed for RKO: subtle, terrifically smooth, but too intellectual to appeal to most popcorn-munchers.

Old-fashioned terror tales of the old-fashioned supernatural—ghosts, demons, footsteps in the night—still succeed, but they must be very well written indeed. The routine Victorian spook story is obsolete—as we see when some lazy editor drags a mess of them out of the public domain and assembles a low-budget book. But fear is not obsolete . . .

"We are as human as our ancestors," Wollheim points out. "In our hearts the primitive animism still lingers. We create new forms of terror, we build up a whole new demonology derived from science and quasi-science, we propound new witchcrafts derived from political soothsaying, we shudder in our souls at the very monstrosities we have found protection in.

"We are living in a most strange world, a world we made ourselves . . . In it we must continue to plunge headlong forward because we are no longer capable of turning back. Our peace is more tense than any peace ever before, our wars more inconceivably horrible, our cities more deadly than the most trackless jungle, our homes more luxurious than the most fabled palaces, and our future more explosively uncertain than all those our ancestors faced.

"In this we create new ghosts, we find new terrors, not to outshout the realities of our terrible days, but to whisper of subtler madness . . ."

This is what Wollheim has tried to find in the fantasies and science fiction he has collected. They are good stories, well told, but by and large I don't believe they do what he wants them to do. The stories which have the real terror of our times written into them are not obvious fantasies. They are stories like the short story whose name and author I have forgotten (was it "The Motorcycle Raid"?), which was the basis for Marlon Brando's "The Wild One," and which reveal in the present glimpses of an unbearable future. They are stories such as Franz Kafka's "The Burrow" in this collection, if it were not just a little too long—stories which never answer the gnawing question whether this was a man, who is burrowing like a beast, or a beast come to think like a man.

There is a quotation from H. G. Wells' novelette "The Croquet Player"—one of his last imaginative books, published here in full—which, I think, shows something else that has happened to terror and fantasy in fiction:

"Her imagination, I think, was killed long ago,"—says the Croquet Player—"but mine I've made into a domestic pet that I like to play with.

I do not think it will ever claw me seriously; it's a pussy now which knows where to stop."

Terror, in most of these stories Donald Wollheim has brought together—even the Bradbury tale—is a pet the authors and their readers like to play with. The old superstitions *are* dead, or dead among the people who buy and read books. The terrors that seem truly to fascinate us now are not mental but physical: hence the upsurge of sadism in the detective stories that sell, in the comics, on the screen, in even the most respectable of novels. Brutality seems to be about the only real terror we can comprehend.

The allegedly frightful concepts—terrors of the imagination—around which these stories and others like them are written are intellectual tricks as phony—if entrancing—as a locked-room mystery. Robert Heinlein's "They," Robert Sheckley's "The Fishing Season," A. E. Coppard's "Gone Away," Richard Matheson's "Shipshape Home," Robert Bloch's "The Dream Makers"—all are variations on one theme: that we are operated by superior intelligences outside our ken. In Charles Beaumont's "Fritzchen," David Grinnell's "The Rag Thing," Wollheim's own "Mimic," it is suggested that there are still unknown monsters among us, and in "The Inheritors" by Robert Lowndes and John Michel, that if the monsters are not here, they will come. Fritz Leiber proposes, in his "Girl With the Hungry Eyes," that our fellow humans may not always be as they seem, and so does Bradbury in his "The Crowd," and H. P. Lovecraft in "He"—though what really emerges there is a feeling of Lovecraft's own fear and horror for the city.

With superstitious fear dwindling away, and the new fears of which Wollheim speaks gone over into serious literature, such terror-fantasies as these are intellectual toys for people with domesticated imaginations. Mrs. Shelley's "Frankenstein" was an intellectual *tour de force.* Certainly Dunsany's earlier fantasies were. I suspect that "Alice in Wonderland" and especially "Through the Looking Glass" have always appealed more to adults than to children. Edison's "Worm Ourobouros" and now Tolkien's superb "Lords of the Ring" triology are adult game-fantasies which we can enjoy, and in which we can lose ourselves by virtue of the authors' skill, without ever believing in them. Most of the sophisticated fantasies which made *Unknown* famous were of this kind, and many of the similar fantasies which Anthony Boucher finds for his *Magazine of Fantasy and Science Fiction* are also.

I suppose that a skilled writer with thorough psychological training could —or can—pick out the deep, basic terrors which haunt the human animal, as distinct from human society, and build them into stories which really terrify. (I know that Ullman's "White Tower," several years ago, was able to give me the queasy feel-

ing that I get from heights.) And I suspect that superstition is by no means as dead as Donald Wollheim supposes: witness the many, many people who want to believe that we are ruled by capricious, arbitrary forces from the stars, from flying saucers, or from Lemuria—and who will back their belief with more hard-earned cash than we croquet players. Meanwhile, anyone for croquet?

FEW WERE LEFT, by Harold Rein. John Day Co., New York. 1955. 248 pp. $3.50.

This is the story of a handful of people who were in the New York subway when atomic bombs leveled the city in the wee hours of a summer morning. As such, presumably it is to be rated as science fiction. Practically, it is a "Bridge of San Luis Rey" gambit in which the survivors react according to their personalities and histories, dream back to the tribulations that made them what they are, and otherwise stand in for stereotypes of the human species.

We begin with Arthur Temmer, down and out, bent on suicide, at the 207th Street end of the 8th Avenue line. There are three other survivors: a woman, a young GI, an older man. They spend two days trying to find a way out through the rubble before starting downtown through the subway tunnel. Gradually the party grows, and finally, after something like twelve days, they reach a colony of survivors at 59th Street and find it under the dictatorship of a little knot of opportunists. Those who deviate are killed—and by this time Arthur has forgotten about suicide, and is a natural deviationist.

If two weeks seems a long time to walk the distance from the top of Manhattan to Columbus Circle, remember that it was done underground in the dark—more like exploring a cave than taking a hike. Yet it is one of the weaknesses of the book that we never are told anything about this part of the struggle, another that the stations seem miraculously light during the days, still another that they apparently make no further attempts to break into the subway tool cupboards to look for flashlights. The success of this kind of story depends a lot on the conviction with which the author presents the details of the struggle, and these are weak: instead we have a stop every night so that someone can search his soul. It's really just a long walk in the dark . . . and a mighty slow one.

THE EDGE OF RUNNING WATER, by William Sloane. Dodd, Mead & Co., New York. 1955. 295 pp. $3.00.

I wish Dodd, Mead had reprinted this book and William Sloane's other great classic of the '30s, "To Walk the Night," a year or two sooner,

while science fiction was getting its first spate of critical attention and the fans were still buying everything that came along. These are books neither group should miss.

"The Edge of Running Water" has struck some readers as pure fantasy, since Julian Blair is trying to build an electronic machine which will communicate with the dead. Nevertheless, it is science fiction in the best sense: there is no suggestion of the supernatural anywhere, save that the most three-dimensional character of the book, Esther Walter, is a medium, and that Blair sets about his work by reproducing electrically the conditions of a seance. What he creates in the lonely house on Setauket Point is, perhaps, something very different.

If I have a favorite between the two books, it is still the subtler, less gadgety "To Walk the Night," but the mystery, the suspense, the solid characterization are in both. Reprints though they are, these books of William Sloane's are better than anything we've seen so far this year.

THE GALACTIC BREED, by Leigh Brackett.

CONQUEST OF THE SPACE SEA, by Robert Moore Williams. Ace Books, Inc., New York. 1955. 168 & 151 pp. Paper, 35¢.

If you buy this Ace Double it will be for Leigh Brackett's "The Starmen" under its new title. The cover says: "Revised Edition." Sorry, I haven't compared it with the Gnome hard-cover version, which is still available. Maybe you remember it as a very skillful tale of young Michael Trehearne who tried to prove worthy of his heritage from a star-born race. The Williams half, however, though new to book form, is strictly routine hooly-dooly about mankind on Pluto, stepping-off place for the stars, attacked by ruthless humanoid aliens who think in umpteen dimensions but can't take a fist in the belly.

THE OLD DIE RICH, by H. L. Gold. Crown Publishers, Inc., New York. 1955. 250 pp. $3.00.

These twelve stories by the editor of *Galaxy* are about as good a cross-section of every variety of fantasy-science-fiction—except space opera—as you're likely to get. Horace Gold, like John Campbell and Anthony Boucher, edits a top-rank magazine because he can write top-rank stories himself.

The subtitle to the contrary, these are not all science fiction. There's "Trouble With Water," that well remembered yarn from the fabulous first issue of *Unknown,* about the concessionaire whose hassle with a water gnome left him literally high and dry. "Don't Take It to Heart" is a believable little tale about a shoe salesman, with a snap ending. "And Three to Get Ready . . ." has a little man convinced that he can kill peo-

ple by naming them three times . . . or is it a clever detective yarn?

Of the straight science fiction, your favorite may be the title story about the actor who found out why old people were dying of starvation with a fortune in their possession. My own choice is either "No Charge for Alterations," which raises an insoluble problem of medical ethics in a different society, or "At the Post," in which a handicapper gets at the roots of catatonia. Or maybe it's "Man of Parts," a near classic—only last week end a stranger described the plot and asked me the title—about the spaceman whose life is saved by aliens who patch his fragments into the body of one of their own kind.

Or the romance with an invisible blue-feathered lover in "Love in the Dark." Or "The Man With English," who saw colors as their complements, felt heat as cold. Or the wisp of time paradox revealed as no paradox in "The Biography Project." Or "Hero," perhaps obvious but still successful in its picture of a modest man jammed into notoriety. Or "Problem in Murder" . . . that isn't murder, but is made murder to avoid legal murder.

The book's gimmick is a page of editorial commentary on each story, showing how the idea arose, was thought over and developed, and how the work of H. L. Gold, writer, looks to H. L. Gold, editor. This book ought to make an excellent manual for would-be science fiction writers, and for schools which try to teach writing.

A WAY HOME, by Theodore Sturgeon. Funk and Wagnalls, New York. 1955. 335 pp. $3.50.

Ted Sturgeon is worth a penny a page any old day. You can't help but find some of the eleven stories in this selection by Groff Conklin familiar: Sturgeon stories have been anthologized ever since there were any science fiction anthologies. Ne'mind—the total effect is still good.

As was the case with the last book by that other poet of the f-sf field, Ray Bradbury ("Golden Apples of the Sun,") one or two of these stories are just good stories. They don't need, and you may not feel that they have, a fantastic gimmick. That is certainly true of the short title story about a day-dreaming boy, even though it is picked up from *Amazing Stories*. It is almost true of the long ". . . And My Fear Is Great . . ." (*Beyond*), and as Mr. Conklin notes in his introduction, it was true of the first draft of "Hurricane Trio," perhaps the realest and most human of the eleven, which acquired a spaceship and wound up in *Galaxy* (as did another of the author's recent psychological probings, "Bulkhead," which was published as "Who?").

One of the best of the collection, "Thunder and Roses," which comes close to being the definitive story of the despair produced by an atomic slugging-fest, was here 'way back in 1947. Another one, that's just a joy to read, is "Tiny and the Monster" (also '47). 1946 produced "Mewhu's

Jet," a trick-ending yarn in which the gimmick isn't offensive and the people are delightful, and 1948 was "Unite and Conquer," whose trick is deft but somehow annoying.

We have left the classic "The Hurkle Is a Happy Beast" from *Fantasy & Science Fiction,* one of the yarns which occasionally give that hybrid magazine a savor of the old *Unknown Worlds,* and "Special Aptitude" from *Other Worlds* (called "Last Laugh" in 1951) which is about the least of the lot. I'd have liked to see that other ASF classic, "Killdozer," but as Mr. Conklin points out he has chosen these eleven stories to represent science fiction in which people as people are most important. I don't think the overall result is up to the two previous Sturgeon collections, "Without Sorcery" and "E Pluribus Unicorn," but few books are.

SOLAR LOTTERY, by Philip K. Dick.
THE BIG JUMP, by Leigh Brackett.
Ace Books, Inc., New York, 1955.
188 + 131 pp. 35¢.

Here's another demonstration that you get a whale of a lot for your money from Ace. "Solar Lottery" is in the van Vogt tradition, taking a man with a mission, involving him hopelessly in a society built on a novel concept of science or philosophy, and allowing all sorts of unseen forces to prowl and putter behind the scenes. This time the gimmick is not non-Aristotelian semantics but von Neumann's Theory of Games, which the author has built up as the mainspring of a Twenty-third Century planetary lottery whose one winner, the Quizmaster, is dictator of mankind until an assassin cuts him down or the "bottle"—never quite explained—twitches someone else into his place. Outside the Game, those who have special skills useful to the great manufacturing combines may sell themselves into absolute serfdom, while those who have only manual skills are "unclassified" and hopeless.

Ted Benteley, freed from his classified serfdom by a quirk which is never explained, sells himself in fealty to the Quizmaster, Reese Verrick, only to learn too late that Verrick has been deposed by the bottle. The new Quizmaster is the leader of a strange cult, and Verrick promptly hatches a bizarre plot to drive an unhuman assassin past Cartwright's telepathic corps of guards and regain mastery. But Cartwright, too, has his schemes—and in the background is the mystery of the Flaming Disc at the edge of Space. There's everything in it but the Lensmen, and it tends to grow confusing in spots, but worse is being published for ten times the price . . . and as a bonus there's Leigh Brackett, with another mystery beyond the stars.

This time the question is: what did Ballantyne find on an unknown planet of Barnard's Star, that left him dead yet twitching with ghastly life? Why is Arch Comyn being hunted down, and what hold can he

gain over the ruthless Cochrane clan to make them give him a berth on the next ship to make the Big Jump? And who, or what, are the Transurance of which Ballantyne babbled with his last living breath? It's shorter and moves faster than the Dick story, and near the end we have another of those fascinating bits of word-painting that give Miss Brackett her best claim to the mantle of A. Merritt. This was in one of the Standard magazines two years ago. I missed it then, and I like it now for pure entertainment.

ALL ABOUT THE FUTURE, edited by Martin Greenberg, Gnome Press, New York. 1955. 374 pp. $3.50.

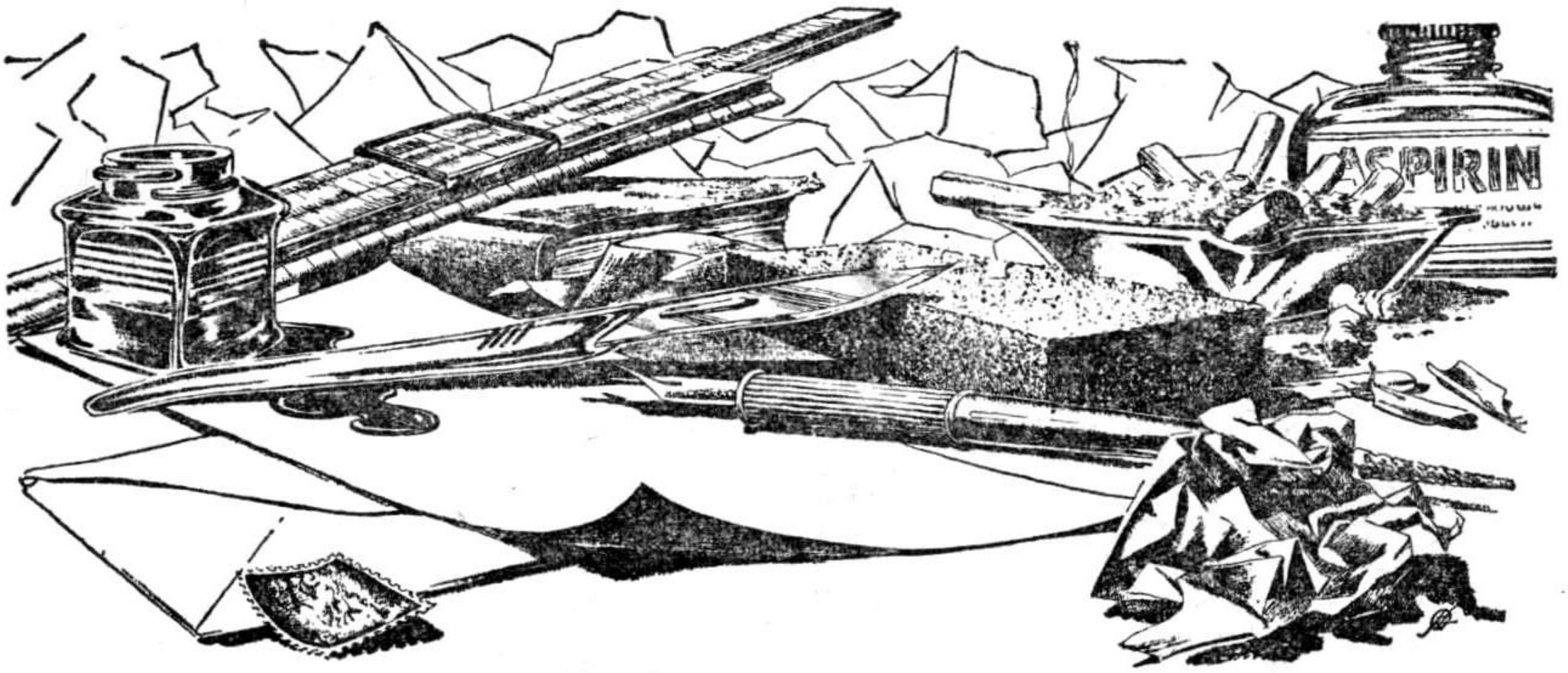
Here is one of the very best of Marty Greenberg's "Adventures in Science Fiction" theme anthologies, as well as the best I've seen in the first half of 1955. It may not be popular with the sheer bulk boys, for there are only six stories in it . . . but they are, with one exception, long novelettes in which the authors have had time and space to develop their themes with loving care. As an added feature there are *two* introductions, a meaty little one by Robert Heinlein on the probabilities of future science and society, and a creepy reprint by Isaac Asimov from a Boston University publication. There are also those gems from *Galaxy,* Edward Wellen's hilariously deadpan vignettes of galactic culture, assembled here as "Excerpts from the Encyclopedia of Galactic Culture" (Etiquette, Law, Slang, Medicine).

Three of the stories, including two of the best and the one minor one of the lot, originated here in ASF. They are Poul Anderson's "Un-Man," with its picture of a corps of identical UN agents working ruthlessly to put down schism, Walter M. Miller's grim "Blood Bank" with its subtle prognosis of the differentiation of the human species and his cultures —what some evolutionists say can no longer happen here on Earth, as I pointed out a few months ago—and Malcolm Jameson's "Hobo God," which just isn't up to the company it's in.

That company is completed by Frederik Pohl's "The Midas Plague," with its society devoted to conspicuous consumption by the underprivileged classes—to keep the wheels of industry turning—, Theodore Sturgeon's happy "Granny Won't Knit," where another kind of static society gets its come-uppance, and Damon Knight's "Natural State," in which a city boy of the post-atomic world comes up hard against a rural culture of "Muckfeet" who can grow more than his machines can make. These, too, are from *Galaxy.* And while I'm still glowing with satisfaction, let me say that the jacket is one of the most attractive Gnome or anyone else has had for some time.

Verdict: Greenberg's back in the groove. Get with him.

THE END



BRASS TACKS

Dear Mr. Campbell:

I like the way that you led into the current discussion of Aristotelian logic. May I offer this statement about statements? *There can be no absolutely true statement to the effect that there can be no absolutely true statement.* This much should be self-evident: If we can't make an absolutely true statement, then any statement of that fact cannot be absolutely true, either. Conversely, it should be theoretically possible to make an absolutely true statement to the effect that there can be an absolutely true statement. In practice, statement should incorporate varying degrees of truth, ranging from absolute lie to absolute truth, of which the above statement may be an example.—Charles W. Schmidt, Hotel Ft. Barbee, St. Marys, Ohio.

Agreed in full! It is possible to make an absolute statement of limited scope, and definite meaning—or a statement of unlimited scope, and indefinite meaning.

Dear Mr. Campbell:

I've been mulling over the assertion of Gregory Comstock (Brass Tacks, August '55) that 10^{120} is a number sufficiently large to enumerate processes, combinations, and events in the universe. It seems to me that application of the simplest sort of probability mathematics would in-

dicate a far, far greater number. My line of reasoning goes like this:

If the universe contains n identifiable (distinguishable or unique) elements, and if these elements can occupy m positions (in space-time), where $m \geqq n$, then the number of arrangements of the elements in the various positions is $\frac{m!}{(m-n)!}$. If m=n, this becomes m!, as 0! is defined as 1. If n=1, it becomes m. (I arrived at the expression, unmathematically enough, by making a table for five elements and ten positions, and then extrapolating. There is undoubtedly a more elegant approach.)

Now, for an example: Suppose we have a parking lot full of cars; they will certainly be easily identified by one means or another. Suppose that there are 1000 cars—not an unreasonable number at all. Since the lot is full, m=n, and the number we are interested in is 1000! My mathematical tables do not give a value for a factorial higher than 20! This is about 2.4×10^{18}. Now, 1000! contains 990 factors $\geqq$ 10, and thus must be much greater than 10^{990}. This is at least the number of possible arrangements of the 1000 cars in the lot at any one time. If there were room for 10,000 cars, there would be 10^{1000} arrangements figuring the value of the factorials the same way as above, or 10^{3000}, allowing for the fact that there are 1000 factors $\geqq$ 1000.

These are all good-sized numbers, and they refer to a pretty hum-drum case. They certainly seem to indicate that it would take "darn near" an infinite number to list the possible arrangements of all elements in all space-time.— C. W. Staufenberg, Jr., 912 Waverly Road, Glen Ellyn, Illinois.

And that's why trial and error methods won't solve a complex problem!

Dear John:

I have just thought of a little game to drive your readers nuts. Any reader should be able to guess, from the equipment ordered by a chemical laboratory, what that laboratory is for. That is, the stuff ordered over and beyond the beakers, burettes, standard chemicals and what have you, that are common to all laboratories. Now I, as you know, run a chemistry lab at (censored) and the following is a list—very partial—of some of the not exactly conventional articles that have been ordered for legitimate reasons, and delivered to me, during the last couple of years. Honest to God, there are no phonies in the lot. I suggest that any reader who can deduce what we do for a living at the lab deserves a leather medal, or a fur-lined teacup. Here follows the list:

1 clothes wringer—hand operated.
100 gms haemoglobin
1 12-pound cannon ball—model 1865
1 vegetable slicer
1 cheese grater
50 20mm cannon shells (AP)

1 dozen polythene freezer bags
1 vacuum cleaner
1 vacuum windshield wiper
1 tom cat
1 gallon #10 motor oil (HD)
1 wet test gas meter
4 dozen sputum jars
60,000 1.5″ cellulose acetate disks
1 surplus 5″ gun turret
20 polythene booties
2 micro spray nozzles
3 dozen empty aerosol bombs
1 drafting machine
500 3/8″ neoprene O rings
24 Pyrex baking dishes
50 gms. brucine
3 20 pound dumbbells
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1000 4″ sections Sched 40 2″ iron pipe
5 Mark IX combat gas masks
3000 single edge razor blades
20 doz. sheets diamond shaped graph paper
2000 6/32″ allen head screws
20 feet of pipe cleaner
Mod 21. Perkin Elmer Recording IR Spectrometer
12 model airplane sparkplugs
200 pounds tech ammonium nitrate
5 dozen broom holders
6 surgical scalpels
2 Speedomax recorders
1-36″ pipe wrench
1 beryllium-copper hatchet
1 nicrotome
1 47000 pound hydraulic press
5 dozen sheets five cornered graph paper.

There is the list, John, and I assure you that (1) every item on it is genuine and had a definite purpose, and that (2) it is far from complete. We have things like Beckman spectrophotometers, vacuum pumps. and wildly assorted glassware—but so does every lab. The above list is what makes us, to put it mildly, unique. Let the boys have a crack at it! I'd suggest that you leave my name out, for a few people know me and what I do for a living.

Name withheld for reason given. Guess what kind of lab this man acts as purchasing director for!

Dear Mr. Campbell:

It seems kind of a shame to inject a little common sense into the discussion about "aristotelian" vs. "multi-valued" logic that goes on intermittently in ASF. Common sense might spoil people's fun. Still, maybe nobody else will think my contribution *is* common sense.

Anyway, aren't the "two-valued" and the "multi-valued" people talking about entirely different things? One is talking about *logic,* which is two-valued; the other is talking about *reasoning,* which is multi-valued. Look back through some of the arguments that have appeared here in the last couple of years. You will find the two-valued people insisting that there is no possible error in the statement that if all men are mortal, and Socrates is a man, then Socrates is mortal. And they're right. Then the multi-valued pundits come back with

"Ah yes, but how do you know that all men are mortal?" As though that question in some way discredited the original syllogism.

Logic tells you what you can do—or what you can't do—with truth once you know it. Logic says that *if* you know that all men are mortal, and *if* you agree that Socrates is a man, then there are no two ways about it, Socrates will die. But logic has nothing to say about how you are to arrive at this knowledge of yours.

Reasoning must start far back of logic. The premises that logic operates on are reached by such illogical paths as guesswork, inference, analogy, observation, or just plain hunch—all of them highly fallible as foundations on which to build a sound structure of truth.

Logic is an *empty* discipline. It serves as a vessel. You can pour truths into it, and after they are thoroughly mixed, apparently new truths may sometimes come out. But something has to be put in before you can get anything out.

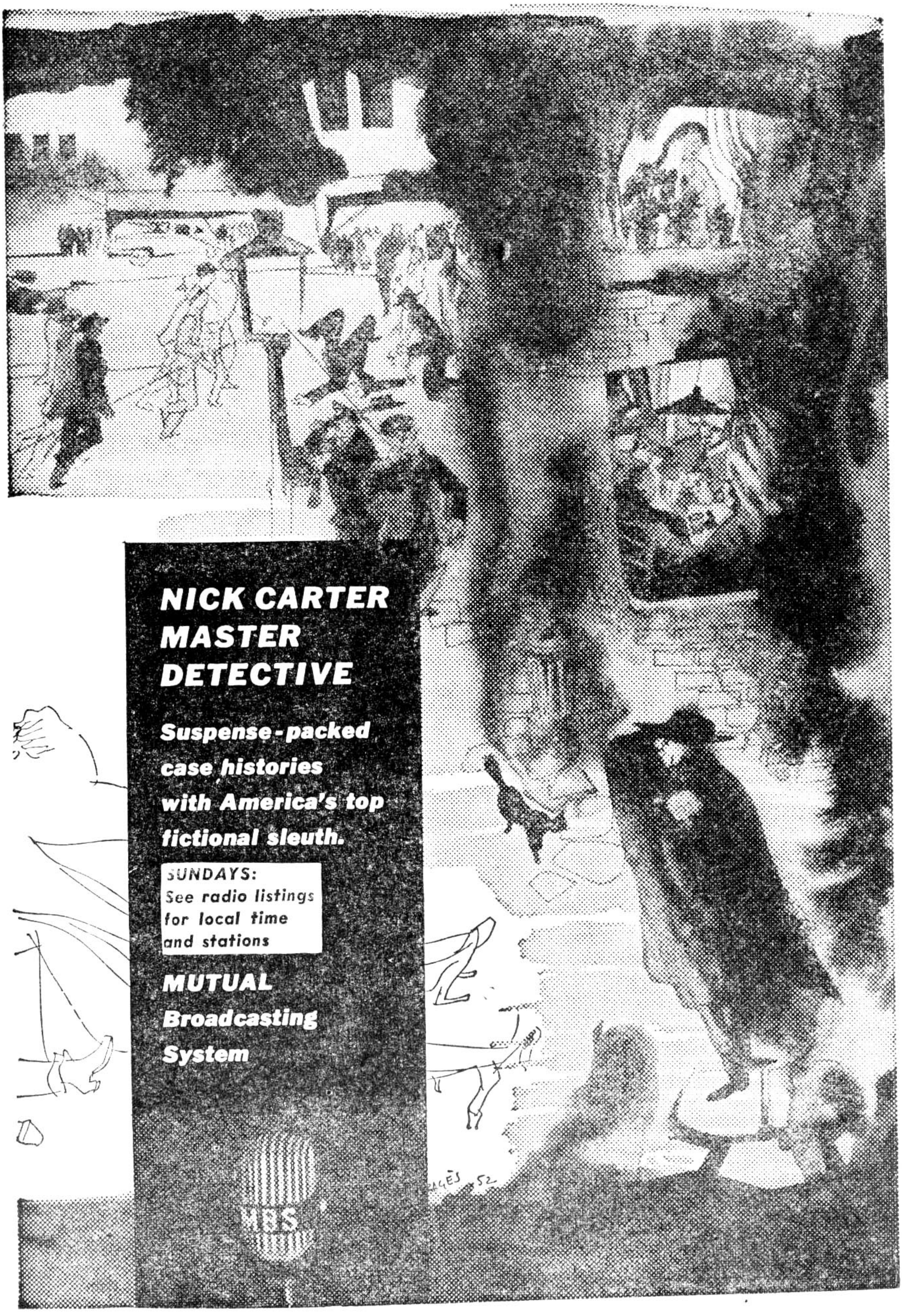
There may be times when it looks as though pure logic is saying something concrete. An Aristotelian may divide all houses into those that are white and those that are nonwhite. It is a perfectly correct division, and may seem to be significant—until it is applied to a real house. Then it is clear that nobody can be perfectly sure which class a particular white-painted house belongs in. But that doesn't invalidate any logical conclusions about white houses: the only thing it casts doubt on is the application of these conclusions to any real case.

So—back to the argument. Logic is, and will continue to be, Aristotelian, because Aristotle happened to get his name attached to a certain kind of mental operation. This operation is two-valued. Reasoning, on the other hand, can be as multi-valued as the mind of the man who does it. You may distinguish three shades of houses, white, gray and black; or you may prefer an infinitude of shades between white and black. You may even want a cantorian higher infinity in there.

In practice, of course, even though it works with doubtful premises—and all real premises are doubtful—logic will often give results that are close enough to truth to be useful. But the man who insists on *sticking* to logic will always find himself holding an empty pitcher.—Daniel Luzon Morris, 535 East 117th Street, Seattle 55, Washington.

This discussion I agree with in full! The statement that logic is an empty vessel makes sound sense to me.

★ ★ ★ ★ ★ ★ ★ ★ ★ ★ ★ ★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(*Continued from page* 5)
injustice, of not being given what he wants and has a right to have. It not infrequently takes several minutes of patient questioning before the parents can get a definition of "that" adequate to make it possible to give it to the child.

A culture that demands that an individual "face reality" is, in essence, demanding "Give us that!"—and, unfortunately, reacts in a manner startlingly like the child when asked to define "reality."

There are levels of reality, unfortunately—iron is real, of course, and so are magnetic fields. The solidity of iron is real—except, of course, to things like X rays, magnetic fields, and electric currents which pass through it readily, and to multi-mile-a-second particles, which interact with steel on the basis of steel being a dense gaseous medium. (At one hundred miles a second, the mechanical strength of steel cannot be detected, save by the most sensitive measurements. The impact of a one-hundred-mile-a-second meteorite involves energy-levels so high that both meteorite and steel wall would react almost perfectly according to gas laws.)

Logic happens to be one of the levels of reality; ignoring it is perfectly possible, just as it is possible for a drunken driver to ignore the concrete-and-steel bridge abutment in his path. The difficulty is that logic —like the bridge-abutment—won't ignore the individual man.

It's unwise to get stuck with the idea that a newly-discovered level of reality is "the secret of it all," however. There's plenty of evidence to indicate that the mystics have something; their major difficulty is that, having discovered level D, they tend to say that levels A, B, and C are "all illusion—it's really nothing but D!" They're not alone, however; the logician, working at level C, knows the mystic is not facing reality (which is true) and that only he is (which is false). When two individuals who are both in the wrong, and don't realize it, start arguing, the results can vary from the hilarious to the catastrophic, depending on their age, condition, and available methods of arguing. If lithium-hydride bombs are included in the methods of argument, the results are, of course, catastrophic.

The gentlemen who are planning that research are going to have a wonderful time, because, having been oriented in a highly successful, world-dominant Western culture, they know that they have been oriented to face reality. They have, indeed.

But . . . not *all* reality. And that, of course, is contrary to the indoctrination of the Western Culture! Only a Western Cultural orientation would dream up, as a prerequisite to giving legal testimony, an oath to tell "The truth, the whole truth, and nothing but the truth." It requires an orientation based on the concept of total, *complete and ultimately final* revelation of truth to consider that such a promise does not automatically disqualify the witness as one of unsound

mind. Obviously, anyone swearing to such a performance has himself confused with Almighty God.

Of course I'm aware that the oath is, actually, intended to have the understood reservation "so far as I am aware." But if there is such a thing as a "Freudian slip" that reveals an individual's subconscious thinking—there are, then, equivalent slips wherein a culture will reveal its subconscious thinking. I agree freely that the culture meant to say something different—but the slip is rather interesting, too.

When the researchers start investigating thinking and language, they will be trying to investigate a phenomenon of a type *in which they themselves participate*. Like a man on the street at Times Square in the New Year celebration in New York City trying to count the crowd, they may find the problem extremely confusing. Being immersed in it, they can't see it.

There is a class "true" and a class "false" in the Western Culture's compartmentalization of categories, and statements are to be filed in one or the other categories. Intellectually, the scientist has learned to go beyond, and return the Scotch Verdict "not proven." But . . . there are a lot of things that are proven-by-postulate-to-the-contrary.

In our indoctrination, for instance, it is postulated that angels can fly, but human beings cannot. Therefore if an individual demonstrates the ability to levitate himself (as D. D. Home did) it is a hoax, as proven by the postulate-to-the-contrary that human beings can't fly. Equally, death-magic, telepathy, and telekinesis are proven untrue by postulate-to-the-contrary.

Now how, I wonder, will the researchers handle the problem of studying their own inability to think in the area of such phenomena?

Never having experienced observing-a-man-levitating-himself, I can't

have a real understanding of the word "levitation."

Some human beings—particularly young blond people—can see the near ultraviolet, as can bees and a number of other organisms. Now let us say that the word *thrule* is the name of the color just beyond violet in the visible spectrum. (Yes, visible; since some human beings can see it, it must be classified as visible.)

Now I have a word, *thrule*. I have an intellectual knowledge of its definition and meaning. But since I am not young, and have never been blond, I have never had the experience of seeing a *thrule* light, or a *thrule* piece of cloth or paper. I can't fully understand the concept *thrule*, then.

I can have a word, *thrule*, with which I can think, however. Because it has been defined as a relationship, I can think of ways to detect *thrule* dyes, if I wanted to make a dress that was pleasing to a young blonde. I could set up spectrophotometric devices, and do some experimenting until I found a *thrule*-colored dye by instrument.

I could even use this method to detect *thrule*-seers; I might print a message in a *thrule* dye on a black coat, and note which individuals reacted to the message.

Incidentally, notice that when the *thrule*-sensitive individuals reacted to the message, their less sensitive companions would insist that their behavior was irrational, reasonless, and baseless.

Now let's consider a *thrule*-sensitive individual in the world of five hundred years ago. He can see something that other individuals can not. He is sensitive to a real phenomenon in a real universe; light of the near ultraviolet spectrum. But he can not relate it to any eperience that those around him understand! Not knowing what visible light is, not knowing the mechanism of vision, or that such a thing as a spectrum exists, the experience *"thrule"* will be, to him, as distinct as the experience "red" is distinct from "blue." He will know that it is different, but be unable to state in what manner, or in what degree it is different.

In setting up this term, I could take advantage of a trick; all of my readers are aware of the general nature of light, the spectrum, and the processes of vision. I could, then, express a possible experience outside your actual experience, by defining it in terms of an extension *in the direction* of shorter wavelength light, and *of moderate degree*. This is, very roughly, equivalent to saying "five hundred miles due north of here," in describing an experience not shared by speaker and listener.

But "five hundred years to the pastward direction" (which I can describe in terms of a vector!) such communication techniques were not available to a *thrule*-sensitive individual. He had no term by which he could describe what he experienced, and would inevitably fall back on the mis-application of a known term. He might have said "violet" or "purple"; he might have insisted

that this pansy wasn't purple, when any fool could plainly see that it was. (It was, in fact, purple-*thrule* rather than pure purple.)

However, if he were reasonably intelligent, by the time he was six or seven years old, he would have been carefully taught. He wouldn't go around correcting his elders any more; he'd have had his dear little ears beat in enough to have gotten over that. In fact, having found out the hard way which side he got clobbered on, he'd know better than to agree with another young *thrule*-seer that the pansy wasn't purple. He might be different, but not necessarily stupid; having been ridiculed, spanked, and bawled out for pretending to see imaginary differences, he would learn the lesson and most punctiliously allow someone else to name colors first, and agree most carefully that there was no such thing as that broad streak of *thrule* down each of the pansy's pretty petals.

This process of education is known as "learning to face reality," or "adjusting to society."

The process of thinking involves manipulating relationships between concepts. Logic is, obviously, one level of this. But now let's consider the problem of a man who is sick in bed and can't get out, who wants to use the telephone. This man has a robot, science-fiction type, but it's a very early model, and not quite as bright as Isaac Asimov's positronic jobs. He tells the robot, "I have to use the telephone, and can't get out of bed."

"I fix," says the robot. The problem is to change the relationship between the telephone on the wall, and the man in the bed. But the robot has always seen the telephone on the wall; it happens that he considers the telephone as part of the wall. Being powered by atomic motors, and hyper-steel actuators, he goes over, lifts out the wall with considerable rending of two-by-fours, plaster, and wire-lath, and brings it over to the bed.

He has fulfilled the requirement; he has changed the relationship between the man-in-bed and the telephone-on-the-wall.

Obviously, he first *thought* of this solution of the problem. The think-

ing was real, and produced a solution. The solution may be considered inefficient, undesirable, or insane—but it's thinking. And, incidentally, it isn't insane; it's simply exceedingly and inappropriately clumsy. It *did* solve the assigned problem.

The robot's trouble was that he didn't adequately differentiate the elements of the problem. His actions can be directly compared with the human race's action in solving the problem of scurvy aboard sailing ships on long voyages. Lack of fresh vegetables was known to be related to the occurrence of scurvy. They tried to bring fresh vegetables, but, like the robot trying to bring the wall to the man, if they were brought too far the antiscorbutic property vanished—as the telephone wiring in the wall would, eventually, be snapped.

The British found that limes worked, and, further, that lime juice would keep. They'd done a bit better job of differentiating, and narrowing the problem down.

Now, of course, we can just bring along vitamin C tablets.

Clumsy thinking results when inadequate differentiation has been made. Without adequately precise terms, without sharply distinctive words, thinking can still be carried out—but on a basis of bringing the wall to the man because it has a telephone on it. A dog can think and solve problems—but he's darned clumsy about it, because he has to think in terms of *experiences as a gestalt;* the human being abstracts the critical part of an experience, and with that far more manipulable abstract, thinks more efficiently.

Certainly you can think without words—animals do. It would be remarkable if human beings couldn't do what mammals have been doing for megayears. Trouble is, when we use that word "think" we're not merely hauling the whole wall over—we're trying to bring the house and its foundations along, too. "Think" is a collective verb—which may not be a term recognized by English grammarians, but if it isn't, they need to invent it. It refers to a whole family of activities, on a dozen different levels of action. Earth, air, fire, and water *are* elements—in a sort of confused, inadequately differentiated sense. They represent solid, gas, and liquid states of all matter, plus energy. Were the old boys who worked with those "not thinking" because they didn't have our modern high-precision words?

Were the Romans "not manufacturing" because they didn't have machine lathes, drop-forges, and rolling mills?

All in all, I suspect the researchers on the problem of thinking and language are going to run into the finest mare's-nest of interlocked and interacting problems anyone could ask for. It's an immensely difficult problem they've tackled—and one that, by the time it's been cracked, will force on the whole of the culture and all of science some badly needed reorientations.

THE EDITOR.

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