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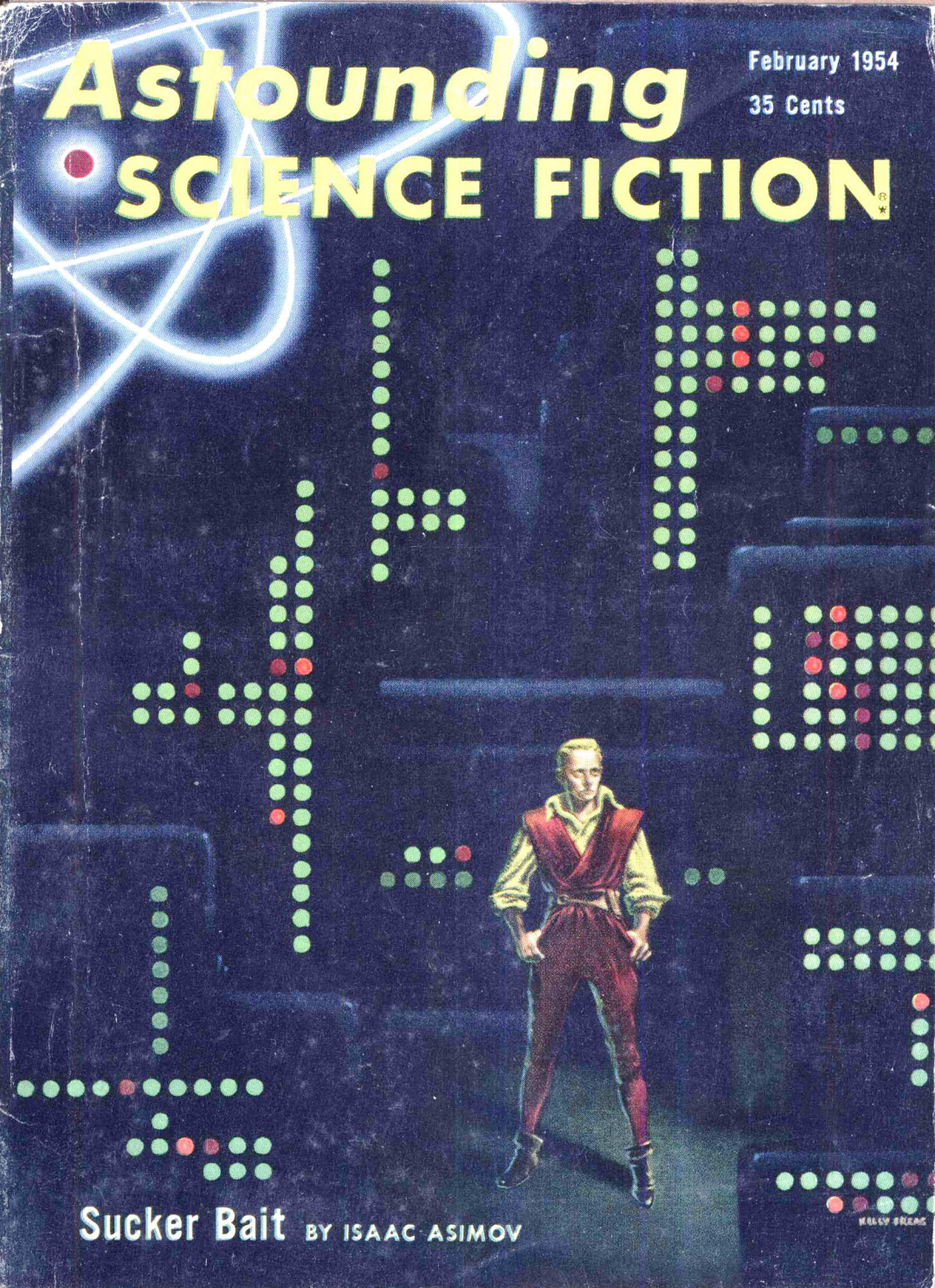

Sucker Bait BY ISAAC ASIMOV

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EDITORIAL

DANGER: MEN AT WORK

Every land animal knows instinctively that gravity is dangerous. It's an all-pervading, ever-present force that must be accounted for every instant of the animal's existence.

Man was the first animal to figure out that it could be turned to good account. He invented dropping rocks on animals too big to attack.

Land animals learned, too, that fire was a deadly, dangerous thing; they avoid its neighborhood with an instinctive fear.

Man was the first animal to figure out that it could be turned to good account. If it scared animals, it would keep them away. It also turned out to be comforting in cold weather. Other animals continued to avoid the dangerous problem of fire. Except, of course, in the form of steaks, roasts, chops and stews.

It was some while before Man wrapped the fire in a metal tube, and made a tool of it that made it easier to convert animals into steaks, roasts, chops and stews.

In the meantime, Man had learned to make that deadly dangerous force of nature into a most extremely useful tool. It remained, and remains, a dangerous tool—as is any powerful force. But the risk has paid magnificent returns.

While fire was still in process of being tamed, Man was fearfully watching another mighty force of Nature. Like all other land animals, Man feared the lightning.

Electricity *is* dangerous. It's still extremely dangerous, to anyone who isn't thoroughly familiar with the characteristics of the forces involved. But over the last few centuries, Man has learned to handle the risk; it has proven a worthwhile effort. Electricity

has turned out to be an extremely versatile and powerful tool. Far more adaptable than fire, its energies can do jobs hitherto utterly impossible.

Now Man is busily studying another deadly dangerous force—the energies of the atomic nucleus. It's a risk; that it is dangerous is beyond question. But—the question of risk, like all forces of Nature, is two-edged. There's the risk of *not* doing, as well as the risk of doing.

When the first mammals took the risk of trying to maintain a constant body temperature, there was an acute danger involved—starvation and thirst. The saurians weren't so profligate of energy, and didn't need such quantities of fuel and water.

However, there was a certain risk in *not* taking that risk. The mighty Brontosaurus, and the Tyrannosaurus, if they could be consulted, might report on that side of the risk.

To those who participate, there is the risk of failure; to those who don't participate—there is the risk of success-for-the-others.

The animals who didn't take the risk of seeking to understand fire are at the mercy of the one lineage that took the risk. The risk of electricity is great; the peoples who do not accept that risk take a different kind of risk.

It would, perhaps, be an easy way out if we could convince everyone to stop taking any new risks, and settle down permanently with what we are and what we have. The difficulty with that is that two billion years of development has produced a race that grew by taking risks and winning—not by seeking safety in a hard, thick shell. (Oysters make good eating.) After two billion years, the habit is well established; only an utter fool would imagine that Man would settle down peaceably to a graceful old age of Stability. Any effort to enforce such an idea is, furthermore, completely illusory; those individuals who are most interested in taking risks are the ones who would be taking the new risks if no effort to suppress them were made. They are constitutionally willing, therefore, to take the risk of violating any laws against risk-taking!

The only way to handle the situation, then, is to acknowledge the existence of dangerous forces, and acknowledge that they must be studied and understood. The study, however, should be done by open agreement, under optimum conditions.

Furthermore, most of the experiments should be made well removed from this planet, where their failure cannot endanger the entire world. Many of them must be made, no doubt, outside of this Universe.

Fortunately, that can be done; it is also much more economical of time and equipment to do it in remote-from-Earth areas. Imagination is another one of Nature's extremely powerful forces—a force more powerful than all others combined, since all

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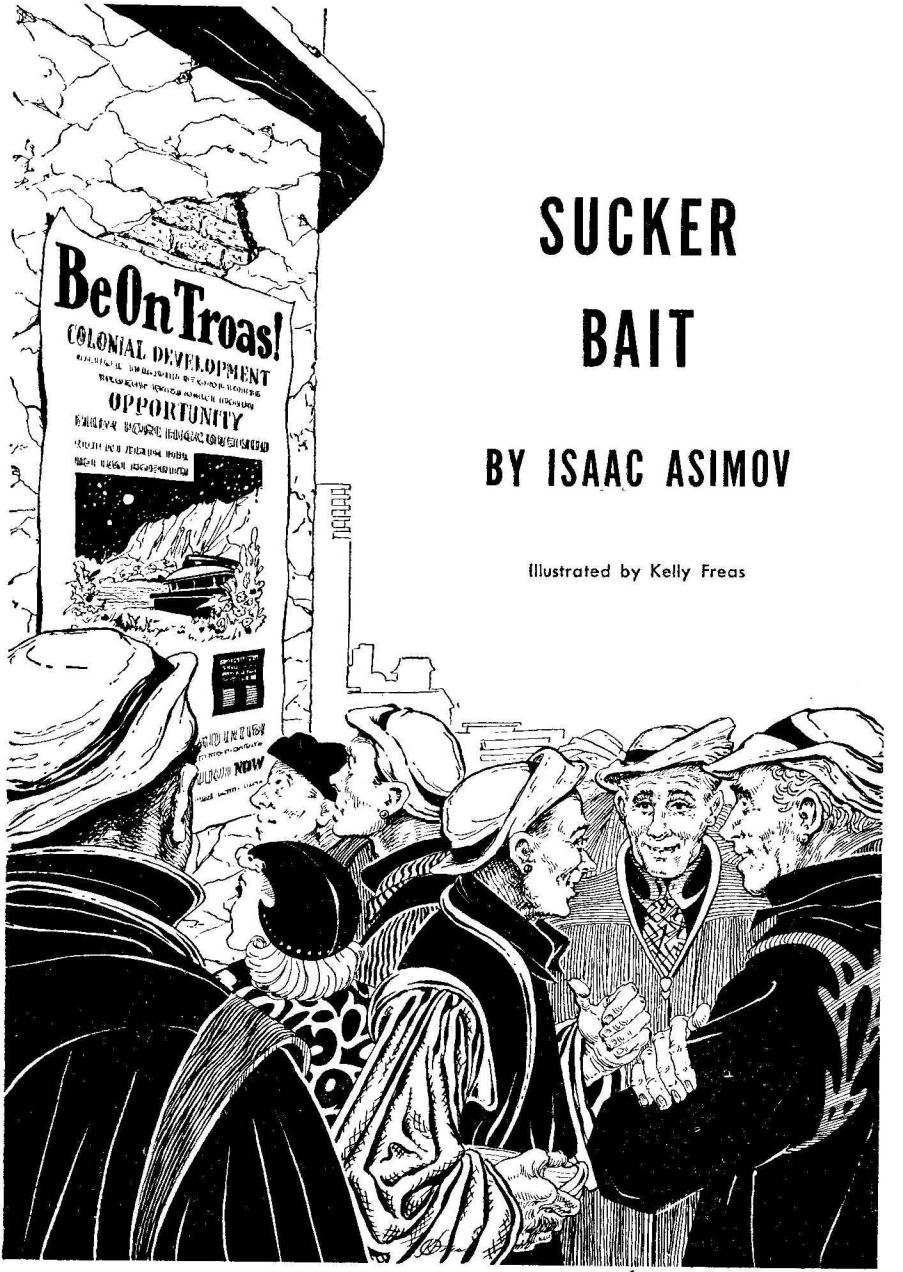
SUCKER BAIT

BY ISAAC ASIMOV

Illustrated by Kelly Freas



First of Two Parts. *A fair green planet will always be bait to the interstellar explorer-colonist type. But when a planet has some mysterious killer-characteristic—then it's "sucker bait"!*

The ship, *Triple G.* flashed silently out of the nothingness of hyperspace and into the all-ness of space-time. It emerged into the glitter of the great star-cluster of Hercules.

It poised gingerly in space, surrounded by suns and suns and suns, each centering a gravitational field that wrenched at the little bubble of metal. But the ship's computers had done well and it had pin-pricked squarely into position. It was within a day's journey—ordinary space-drive journey—of the Lagrange System.

This fact had varying significance to the different men aboard ship. To the crew it was another day's work and another day's flight pay and then shore rest. The planet for which they were aiming was uninhabited but shore rest could be a pleasant interlude even on an asteroid. They did not trouble themselves concerning a possible difference of opinion among the passengers.

The crew, in fact, were rather contemptuous of the passengers, and avoided them.

Eggheads!

And so they were, every one of them but one. Scientists, in politer terms—and a heterogeneous lot. Their nearest approach to a common emotion at that moment was a final anxiety for their instruments, a vague desire for a last check.

And perhaps just a small increase of tension and anxiety. It *was* an uninhabited planet. Each had expressed himself as firmly of that belief a number of times. Still, each man's thoughts are his own.

As for the one unusual man on board ship—not a crewman and not really a scientist—his strongest feeling was one of bone-weariness. He stirred to his feet weakly and fought off the last dregs of spacesickness. He was Mark Annuncio, and he had been in bed now for four days, feeding on almost nothing, while the ship wove in and out of the Universe, jumping its light-years of space.

But now he felt less certain of imminent death and he had to answer the summons of the captain. In his inarticulate way, Mark resented that summons. He was used to having his own way, seeing what he felt like seeing. Who was the captain to—

The impulse kept returning to tell Dr. Sheffield about this and let it rest there.

But Mark was curious, so he knew he would have to go.

It was his one great vice. Curiosity!

It also happened to be his profession, and his mission in life.

Captain Follenbee of the *Triple G* was a hard-headed man. It was how he habitually thought of himself. He had made government-sponsored runs before. For one thing, they were profitable. The Confederacy didn't haggle. It meant a complete overhaul of his ship each time, replacement of defective parts, liberal terms for the crew. It was good business. Damned good business.

This run, of course, was a little different.

It wasn't so much the particular gang of passengers he had taken aboard. (He had expected temperament, tantrums and unbearable foolishness but it turned out that eggheads were much like normal people.) It wasn't that half his ship had been torn down and rebuilt into what the contract called a "universal central-access laboratory."

Actually, and he hated the thought, it was "Junior"—the planet that lay ahead of them.

The crew didn't know, of course, but he, himself, hard-head and all, was beginning to find the matter unpleasant.

But only beginning—

At the moment, he told himself, it was this Mark Annuncio, if that was the name, who was annoying him. He slapped the back of one hand against the palm of the other and thought angrily about it. His large, round face was ruddy with annoyance.

Insolence!

A boy of not more than twenty, with no position that he knew of among the passengers, to make a request like that.

What was behind it? *That* at least ought to be straightened out.

In his present mood, he would like to straighten it out by means of a jacket collar twisted in a fist and a rattle of teeth, but better not—

After all, this was a curious kind of light for the Confederacy of Worlds to sponsor, and a twenty-year-old, over-curious rubberneck might be an integral part of the strangeness. What was he on board *for?* There was this Dr. Sheffield, for instance, who seemed to have no job but to play nursemaid for the boy. Now why was that? Who *was* this Annuncio?

He had been spacesick for the entire trick, or was that just a device to keep to his cabin—

There was a light burning as the door-signal sounded.

It would be the boy.

Easy now, thought the captain. *Easy now.*

Mark Annuncio entered the captain's cabin and licked his lips in a futile attempt to get rid of the bitter taste in his mouth. He felt light-headed and heavy-hearted.

At the moment he would have given up his Service status to be back on Earth.

He thought wishfully of his own familiar quarters; small but private;

alone with his own kind. It was just a bed, desk, chair, and closet, but he had all of Central Library on free call. Here there was nothing. He had thought there would be a lot to learn on board ship. He had never been on board ship before. But he hadn't expected days and days of spacesickness.

He was so homesick he could cry, and he hated himself because he knew that his eyes were red and moist and that the captain would see it. He hated himself because he wasn't large and wide; because he looked like a mouse.

In a word, that was it. He had mouse-brown hair with nothing but silken straightness to it; a narrow, receding chin, a small mouth and a pointed nose. All he needed were five or six delicate vibrissae on each side of the nose to make the illusion complete. And he was below average in height.

And then he saw the star-field in the captain's observation port and the breath went out of him.

Stars!

Stars as he had never seen them.

Mark had never left the planet Earth before. (Dr. Sheffield told him that was why he was spacesick. Mark didn't believe him. He had read in fifty different books that spacesickness was psychogenic. Even Dr. Sheffield tried to fool him sometimes.)

He had never left Earth before, and he was used to Earth's sky. He was accustomed to viewing two thousand stars spread over half a celestial sphere with only ten of the first magnitude.

But here they crowded madly. There were ten times the number in Earth's sky in that small square alone. And *bright!*

He fixed the star-pattern greedily in his mind. It overwhelmed him. He knew the figures on the Hercules cluster, of course. It contained between one million and ten million stars—no exact census had been taken as yet—but figures are one thing and stars are another.

He wanted to count them. It was a sudden overwhelming desire. He was curious about the number. He wondered if they all had names; if there were astronomic data on all of them. Let's see—

He counted them in groups of hundreds. Two—three—He might have used the mental pattern alone, but he liked to watch the actual physical objects when they were so startlingly beautiful. Six—seven—

The captain's hearty voice splattered over him and brought him back to ship's interior.

"Mr. Annuncio. Glad to meet you."

Mark looked up, startled, resentful. Why was his count being interrupted.

He said, irritably, "The stars!" and pointed.

The captain turned to stare. "What about them? What's wrong?"

Mark looked at the captain's wide back and his overdeveloped posterior. He looked at the gray stubble that

covered the captain's head, at the two large hands with thick fingers that clasped one another in the small of the captain's back and flapped rhythmically against the shiny plastex of his jacket.

Mark thought: *What does* he *care about the stars? Does* he *care about their size and brightness and spectral classes?*

His lower lip trembled. The captain was just one of the noncompos. Everyone on ship was a noncompos. That's what they called them back in the Service. Noncompos. All of them. Couldn't cube fifteen without a computer.

Mark felt very lonely.

He let it go—no use trying to explain—and said, "The stars get so thick here. Like pea soup."

"All appearance, Mr. Annuncio." (The captain pronounced the "c" in Mark's name like an "s" rather than a "ts" and the sound grated on Mark's ear.) "Average distance between stars in the thickest cluster is over a light-year. Plenty of room, eh? Looks thick, though. Grant you that. If the lights were out, they'd shine like a trillion Chisholm points in an oscillating force-field."

But he didn't offer to put the lights out and Mark wasn't going to ask him to.

The captain said, "Sit down, Mr. Annuncio. No use standing, eh? You smoke? Mind if I do? Sorry you couldn't be here this morning. Had an excellent view of Lagrange I and II at six space-hours. Red and green. Like traffic lights, eh? Missed you all trip. Space-legs need strengthening, eh?"

He barked out his "eh's" in a high-pitched voice that Mark found devilishly irritating.

Mark said in a low voice, "I'm all right now."

The captain seemed to find that unsatisfactory. He puffed at his cigar and stared down at Mark with eyebrows hunched down over his eyes. He said, slowly, "Glad to see you now, anyway. Get acquainted a little. Shake hands. The *Triple G*'s been on a good many government-chartered cruises. No trouble. Never had trouble. Wouldn't want trouble. You understand."

Mark didn't. He was tired of trying to. His eyes drifted back hungrily to the stars. The pattern had changed a little.

The captain caught his eyes for a moment. He was frowning and his shoulders seemed to tremble at the edge of a shrug. He walked to the control panel, and like a gigantic eyelid, metal slithered across the studded observation port.

Mark jumped up in a fury, shrieking, "What's the idea? I'm counting them, you fool."

"*Counting*—" The captain flushed, but maintained a quality of politeness in his voice. He said, "Sorry! Little matter of business we must discuss."

He stressed the word "business" lightly.

Mark knew what he meant. "There's nothing to discuss. I want to see the ship's log. I called you hours ago to tell you that. You're delaying me."

The captain said, "Suppose you tell me why you want to see it, eh? Never been asked before. Where's your authority?"

Mark felt astonished. "I can look at anything I want to. I'm in Mnemonic Service."

The captain puffed strongly at his cigar. (It was a special grade manufactured for use in space and on enclosed space-objects. It had an oxidant included so that atmospheric oxygen was not consumed.)

He said, cautiously, "That so? Never heard of it. What is it?"

Mark said indignantly, "It's the Mnemonic Service, that's all. It's my job to look at anything I want to and to ask anything I want to. And I've got the right to do it."

"Can't look at the log if I don't want you to."

"You've got no say in it, you . . . you *noncompos*."

The captain's coolness evaporated. He threw his cigar down violently and stamped at it, then picked it up and poked it carefully into the ash vent.

"What the Galactic Drift is this?" he demanded. "Who are you, anyway? Security agent? What's up? Let's have it straight. Right now."

"I've told you all I have to."

"Nothing to hide," said the captain, "but I've got rights."

"Nothing to hide?" squeaked Mark. "Then why is this ship called the *Triple G?*"

"That's its name."

"Go on. No such ship with an Earth registry. I knew that before I got on. I've been waiting to ask you."

The captain blinked. He said, "Official name is *George G. Grundy. Triple G* is what everyone calls it."

Mark laughed. "All right, then. And after I see the log book, I want to talk to the crew. I have the right. You ask Dr. Sheffield."

"The crew too, eh?" the captain seethed. "Let's talk to Dr. Sheffield, and then let's keep you in quarters till we land. Sprout!"

He snatched at the intercom box.

The scientific complement of the *Triple G* were few in number for the job they had to do, and, as individuals, young. Not as young as Mark Annuncio, perhaps, who was in a class by himself, but even the oldest of them, Emmanuel George Cimon—astrophysicist—was not quite thirty-nine. And with his dark, unthinned hair and large, brilliant eyes, he looked still younger. To be sure, the optic brilliance was partly due to the wearing of contact lenses.

Cimon, who was perhaps overconscious of his relative age, and of the fact that he was the titular head of the expedition—a fact most of the others were inclined to ignore—usually affected an undramatic view of

the mission. He ran the dotted tape through his fingers, then let it snake silently back into its spool.

"Run of the mill," he sighed, seating himself in the softest chair in the small passenger's lounge. "Nothing."

He looked at the latest color photographs of the Lagrange binary and was impervious to their beauty. Lagrange I, smaller and hotter than Earth's own sun, was a brilliant green-blue, with a pearly green-yellow corona surrounding it like the gold setting of an emerald. It appeared to be the size of a lentil or of a ball bearing out of a Lenser-ratchet. A short distance away—as distances go on a photograph—was Lagrange II. It appeared twice the size of Lagrange I, due to its position in space. (Actually, it was only four-fifths the diameter of Lagrange I, half its volume and two-thirds its mass.) Its orange-red, toward which the film was less sensitive, comparatively, than was the human retina, seemed dimmer than ever against the glory of its sister sun.

Surrounding both, undrowned by the near-by suns, as the result of the differentially-polarized lens specifically used for the purpose, was the unbelievable brilliance of the Hercules cluster. It was diamond dust, scattered thickly, yellow, white, blue, and red.

"Nothing," said Cimon.

"Looks good to me," said the other man in the lounge. He was Groot Knoevenaagle—physician—short, plump, and known to man by no name other than Novee.

He went on to ask, "Where's Junior?" then bent over Cimon's shoulder, peering out of slightly myopic eyes.

Cimon looked up and shuddered, "It's name is not Junior. You can't see the planet, Troas, if *that's* what you mean, in this wilderness of stars. This picture is *Scientific Earthman* material. It isn't particularly useful."

"Oh, Space and back!" Novee was disappointed.

"What difference is it to you, anyway?" demanded Cimon. "Suppose I said one of those dots was Troas—any one of them. You wouldn't know the difference and what good would it do you?"

"Now wait, Cimon. Don't be so superior. It's legitimate sentiment. We'll be living on Junior for a while. For all we know, we'll be dying on it."

"There's no audience, Novee, no orchestra, no mikes, no trumpets, so why be dramatic. We won't be dying on it. If we do, it'll be our own fault, and probably as a result of overeating." He said it with the peculiar emphasis men of small appetite use when speaking to men of hearty appetite, as though a poor digestion was something that came only of rigid virtue and superior intellect.

"A thousand people did die," said Novee, softly.

"Sure. About a billion men a day die all over the galaxy."

"Not this way."

"Not what way?"

With an effort, Novee kept to his usual drawl. "No discussions except at official meetings. That was the decision."

"I'll have nothing to discuss," said Cimon, gloomily. "They're just two ordinary stars. Damned if I know why I volunteered. I suppose it was just the chance of seeing an abnormally large Trojan system from close up. It was the thought of looking at a habitable planet with a double sun. I don't know why I should have thought there'd be anything amazing about it."

"Because you thought of a thousand dead men and women," said Novee, then went on hastily. "Listen, tell me something, will you? What's a Trojan planet, anyway?"

The physician bore the other's look of contempt for a moment, then said, "All right. All right. So I don't know. You don't know everything either. What do you know about ultrasonic incisions?"

Cimon said, "Nothing, and I think that's fine. It's my opinion that information outside a professional man's specialty is useless and a waste of psycho-potential. Sheffield's point of view leaves me cold."

"I still want to know. That is, if you can explain it."

"I can explain it. As a matter of fact, it was mentioned in the original briefing, if you were listening. Most multiple stars, and that means one third of all stars, have planets of a sort. The trouble is that the planets are never habitable. If they're far enough away from the center of gravity of the stellar system to have a fairly circular orbit, they're cold enough to have helium oceans. If they're close enough to get heat, their orbit is so erratic that at least once in each revolution, they get close enough to one or another of the stars to melt iron.

"Here in the Lagrange System, however, we have an unusual case. The two stars, Lagrange I and Lagrange II, and the planet, Troas—along with its satellite, Ilium—are at the corners of an imaginary equilateral triangle. Got that? Such an arrangement happens to be a stable one, and for the sake of anything you like, don't ask me to tell you why. Just take it as my professional opinion."

Novee muttered under his breath, "I wouldn't dream of doubting it."

Cimon looked displeased and continued, "The system revolves as a unit. Troas is always a hundred million miles from each sun, and the suns are always a hundred million miles from one another."

Novee rubbed his ear and looked dissatisfied. "I know all that. I *was* listening at the briefing. But why is it a *Trojan* planet? Why *Trojan?*"

Cimon's thin lips compressed for a moment as though holding back a nasty word by force. He said, "We have an arrangement like that in the

Solar System. The sun, Jupiter and a group of small asteroids form a stable equilateral triangle. It so happens that the asteroids had been given such names as Hector, Achilles, Ajax and other heroes of the Trojan war, hence—or do I have to finish?"

"Is that all?" said Novee.

"Yes. Are you through bothering me?"

"Oh, boil your head."

Novee rose to leave the indignant astrophysicist but the door slid open a moment before his hand touched the activator and Boris Vernadsky—geochemist; dark eyebrows, wide mouth, broad face and with an inveterate tendency to polka-dot shirts and magnetic clip-ons in red plastic—stepped in.

He was oblivious to Novee's flushed face and Cimon's frozen expression of distaste.

He said, lightly, "Fellow scientists, if you listen very carefully you will probably hear an explosion to beat the Milky Way from up yonder in captain's quarters."

"What happened?" asked Novee.

"The captain got hold of Annuncio, Sheffield's little pet wizard, and Sheffield went charging up-deck, bleeding heavily at each eyeball."

Cimon, having listened so far, turned away, snorting.

Novee said, "Sheffield! The man can't get angry. I've never even heard him raise his voice."

"He did this time. When he found out the kid had left his cabin without telling him and that the captain was bully-ragging him—Wow! Did you know he was up and about, Novee?"

"No, but I'm not surprised. Spacesickness is one of those things. When you have it, you think you're dying. In fact, you can hardly wait. Then, in two minutes it's gone and you feel all right. Weak, but all right. I told Mark this morning we'd be landing next day and I suppose it pulled him through. The thought of a planetary surface in clear prospect does wonders for spacesickness. We *are* landing soon, aren't we, Cimon?"

The astrophysicist made a peculiar sound that could have been interpreted as a grunt of assent. At least, Novee so interpreted it.

"Anyway," said Novee, "what happened?"

Vernadsky said, "Well, Sheffield's been bunking with me since the kid twirled on his toes and went over backward with spacesickness and he's sitting there at the desk with his charts and his fist computer chug-chugging away, when the room-phone signals and its the captain. Well, it turns out he's got the boy with him and he wants to know what the blankety-blank and assorted dot-and-dash the government means by planting a spy on him. So Sheffield yells back at him that he'll stab him with a Collamore macro-leveling-tube if he's been fooling with the kid and off he

goes leaving the phone activated and the captain frothing."

"You're making this up," said Novee. "Sheffield wouldn't say anything like that."

"Words to that effect."

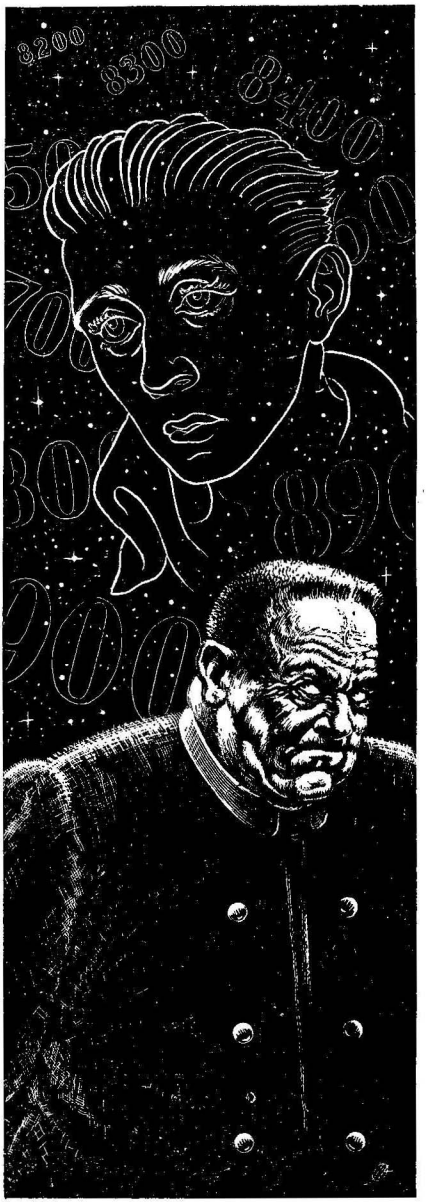
Novee turned to Cimon. "You're heading our group. Why don't you do something about this?"

Cimon snarled, "In cases like this, I'm heading the group. My responsibilities always come on suddenly. Let them fight it out. Sheffield talks an excellent fight and the captain never takes his hands out of the small of his back. Vernadsky's jitterbugging description doesn't mean there'll be physical violence."

"All right, but there's no point in having feuds of any kind in an expedition like ours."

"You mean our mission!" Vernadsky raised both hands in mock-awe and rolled his eyes upward. "How I dread the time when we must find ourselves among the rags and bones of the first expedition."

And as though the picture brought to mind by that was not one that bore levity well after all, there was suddenly nothing to say. Even the back of Cimon's head which was all that showed over the back of the easy-chair seemed a bit the stiffer for the thought.



Oswald Mayer Sheffield—psychologist, thin as a string and as tall as a good length of it, and with a voice that could be used either for singing an

operatic selection with surprising virtuosity or for making a point of argument, softly but with stinging accuracy—did not show the anger one would have expected from Vernadsky's account.

He was even smiling when he entered the captain's cabin.

The captain broke out mauvely, as soon as he entered. "Look here, Sheffield—"

"One minute, Captain Follenbee," said Sheffield, "How are you, Mark?"

Mark's eyes fell and his words were muffled. "All right, Dr. Sheffield."

"I wasn't aware you'd gotten out of bed."

There wasn't the shade of reproach in his voice, but Mark grew apologetic. "I was feeling better, Dr. Sheffield, and I feel bad about not working. I haven't done anything in all the time I've been on the ship. So I put in a call to the captain to ask to see the log book and he had me come up here."

"All right. I'm sure he won't mind if you go back to your room now."

"Oh, won't I?" began the captain.

Sheffield's mild eyes rose to meet the captain. "I'm responsible for him, sir."

And somehow the captain could think of nothing further to say.

Mark turned obediently and Sheffield watched him leave and waited till the door was well-closed behind him.

Then he turned again to the captain. "What's the bloody idea, captain?"

The captain's knees bent a little, then straightened and bent again with a sort of threatening rhythm. The invisible slap of his hands, clasped behind his back could be heard distinctly. "That's my question. I'm captain here, Sheffield."

"I know that."

"Know what it means, eh? This ship, in Space, is a legally recognized planet. I'm absolute ruler. In Space, what I say goes. Central Committee of the Confederacy can't say otherwise. I've got to maintain discipline and no spy—"

"All right, and now let me tell *you* something, captain. You're charted by the Bureau of Outer Provinces to carry a government-sponsored research expedition to the Lagrange System, to maintain it there as long as research necessity requires and the safety of the crew and vessel permits, and then to bring us home. You've signed that contract and you've assumed certain obligations, captain or not. For instance, you can't tamper with our instruments and destroy their research usefulness."

"Who in Space is doing that?" The captain's voice was a blast of indignation.

Sheffield replied calmly, "You are. Hands off Mark Annuncio, captain. Just as you've got to keep your hands off Cimon's monochrome and Vailleux's microptics, you've got to keep your hands off my Annuncio. And that means each one of your ten four-

striped fingers. Got it?"

The captain's uniformed chest expanded. "I take no order on board my own ship. Your language is a breach of discipline, *Mister* Sheffield. Any more like that and it's cabin arrest—you *and* your Annuncio. Don't like it, then speak to Board of Review back on Earth. Till then, it's tongue behind teeth."

"Look, captain, let me explain something. Mark is in the Mnemonic Service—"

"Sure, he said so. Nummonic Service. Nummonic Service. It's plain secret police as far as I'm concerned. Well, not on board *my* ship, eh?"

"Mnemonic Service," said Sheffield, patiently. "Emm-enn-eee-emm-oh-enn-eye-see Service. You don't pronounce the first emm. It's from a Greek word meaning memory."

The captain's eyes narrowed. "He remembers things?"

"Correct, captain. Look, in a way this is my fault. I should have briefed you on this. I would have, too, if the boy hadn't gotten so sick right after the take-off. It drove most other matters out of my mind. Besides, it didn't occur to me that he might be interested in the workings of the ship itself. Space knows why not. He should be interested in everything."

"He should, eh?" the captain looked at the timepiece on the wall. "Brief me now, eh? But no fancy words. Not many of any other kind, either. Time limited."

"It won't take long, I assure you. Now you're a space-going man, captain. How many inhabited worlds would you say there were in the Confederation?"

"Eighty thousand," said the captain, promptly.

"Eighty-three thousand two hundred," said Sheffield. "What do you suppose it takes to run a political organization that size?"

Again the captain did not hesitate. "Computers," he said.

"All right. There's Earth, where half the population works for the government and does nothing but compute and there are computing subcenters on every other world. And even so data gets lost. Every world knows something no other world knows—almost every man. Look at our little group. Vernadsky doesn't know any biology and I don't know enough chemistry to stay alive. There's not one of us can pilot the simplest space-cruiser, except for Fawkes. So we work together, each one supplying the knowledge the others lack.

"Only there's a catch. Not one of us knows exactly which of our own data is meaningful to the other under a given set of circumstances. We can't sit and spout everything we know. So we guess, and sometimes we don't guess right. Two facts, A and B, can go together beautifully sometimes. So Person A, who knows Fact A, says to Person B, who knows Fact B, 'Why didn't you tell me this ten years ago?'

and Person B answers, 'I didn't think it was important,' or 'I thought everyone knew that.'"

The captain said, "That's what computers are for."

Sheffield said, "Computers are limited, captain. They have to be asked questions. What's more the questions have to be the kind that can be put into a limited number of symbols. What's more computers are very literal minded. They answer exactly what you ask and not what you have in mind. Sometimes it never occurs to anyone to ask just the right question or feed the computer just the right symbols, and when that happens the computer doesn't volunteer information.

"What we need . . . what all mankind needs . . . is a computer that is nonmechanical; a computer with imagination. There's one like that, captain." The psychologist tapped his temple. "In everyone, captain."

"Maybe," grunted the captain, "but I'll stick to the usual, eh? Kind you punch a button."

"Are you sure? Machines don't have hunches. Did *you* ever have a hunch?"

"Is this on the point?" The captain looked at the timepiece again.

Sheffield said, "Somewhere inside the human brain is a record of every datum that has impinged upon it. Very little of it is consciously remembered, but all it is there, and a small association can bring an individual datum back without a person's knowing where it comes from. So you get a 'hunch' or a 'feeling.' Some people are better at it than others. And some can be trained. Some are almost perfect, like Mark Annuncio and a hundred like him. Some day, I hope, there'll be a billion like him, and we'll *really* have a Mnemonic Service.

"All their lives," Sheffield went on, "they do nothing but read, look, and listen. And train to do that better and more efficiently. It doesn't matter what data they collect. It doesn't have to have obvious sense or obvious significance. It doesn't matter if any man in the Service wants to spend a week going over the records of the space-polo teams of the Canopus Sector for the last century. *Any* datum may be useful some day. That's the fundamental axiom.

"Every once in a while, one of the Service may correlate across a gap no machine could possibly manage. The machine would fail because no one machine is likely to possess those two pieces of thoroughly unconnected information; or else, if the machine does have it, no man would be insane enough to ask the right question. One good correlation out of the Service can pay for all the money appropriated for it in ten years or more."

The captain raised his broad hand. He looked troubled. He said, "Wait a minute. He said no ship named *Triple G* was under Earth registry. You mean he knows all registered ships by heart?"

"Probably," said Sheffield. "He may have read through the Merchantship Register. If he did, he knows all the names, tonnages, years of construction, ports of call, numbers of crew and anything else the Register would contain."

"And he was counting stars."

"Why not? It's a datum."

"I'm damned."

"Perhaps, captain. But the point is that a man like Mark is different from other men. He's got a queer, distorted upbringing and a queer, distorted view on life. This is the first time he's been away from Service grounds, since he entered them at the age of five. He's easily upset—and he can be ruined. That mustn't happen, and I'm in charge to see it doesn't. He's my instrument; a more valuable instrument than everything else on this entire ship baled into a neat little ball of plutonium wire. There are only a hundred like him in all the Milky Way."

Captain Follenbee assumed an air of wounded dignity. "All right, then. Log book. Strictly confidential, eh?"

"Strictly. He talks only to me, and I talk to no one unless a correlation has been made."

The captain did not look as though that fell under his classification of the word, strictly, but he said, "But no crew." He paused significantly. "You know what I mean."

Sheffield stepped to the door. "Mark knows about that. The crew won't hear about it from him, believe me."

And as he was about to leave, the captain called out, "Sheffield!"

"Yes?"

"What in Space is a 'noncompos.'"

Sheffield suppressed a smile. "Did he call you that?"

"What is it?"

"Just short for *non compos mentis*. Everyone in the Service uses it for everyone not in the Service. You're one. I'm one. It's Latin for 'not of sound mind.' And you know, captain—I think they're quite right."

He stepped out the door quickly.

Mark Annuncio went through the ship's log in some fifteen seconds. He found it incomprehensible, but then most of the material he put into his mind was that. That was no trouble. Nor was the fact that it was dull. The disappointment was that it did not satisfy his curiosity, so he left it with a mixture of relief and displeasure.

He had then gone into the ship's library and worked his way through three dozen books as quickly as he could work the scanner. He had spent three years of his early teens learning how to read by total gestalt and he still recalled proudly that he had set a school record at the final examinations.

Finally, he wandered into the laboratory sections of the ship and watched a bit here and a bit there. He asked no questions and he moved on when any of the men cast more than a casual glance at them.

He hated the insufferable way they looked at him as though he were some sort of queer animal. He hated their air of knowledge, as though there were something of value in spending an entire brain on one tiny subject and remembering only a little of that.

Eventually, of course, he would *have* to ask them questions. It was his job, and even if it weren't, curiosity would drive him. He hoped, though, he could hold off till they had made planetary surface.

He found it pleasant that they were inside a stellar system. Soon he would see a new world with new suns—two of them—and a new moon. Four objects with brand-new information in each; immense storehouses of facts to be collected lovingly and sorted out.

It thrilled him just to think of the amorphous mountain of data waiting for him. He thought of his mind as a tremendous filing system with index, cross-index, cross-cross-index. He thought of it as stretching indefinitely in all directions. Neat. Smooth. Well oiled. Perfect precision.

He thought of the dusty attic that the noncompos called minds and almost laughed. He could see it even talking to Dr. Sheffield, who was a nice fellow for a noncompos. He tried hard and sometimes he almost *understood.* The others, the men on board ship—their minds were lumberyards. Dusty lumberyards with splintery slats of wood tumbled every which way; and only whatever happened to be on top could be reached.

The poor fools! He could be sorry for them, if they weren't so sloppy-nasty. If only they *knew* what they were like. If only they *realized.*

Whenever he could, Mark haunted the observation posts and watched the new worlds come closer.

They passed quite close to the satellite, "Ilium." (Cimon, the astrophysicist, was very meticulous about calling their planetary destination "Troas" and the satellite "Ilium," but everyone else aboard ship called them "Junior" and "Sister," respectively.) On the other side of the two suns, in the opposite Trojan position, were a group of asteroids. Cimon called them "Lagrange Epsilon" but everyone else called them "The Puppies."

Mark thought of all this with vague simultaneity at the moment the thought "Ilium" occurred to him. He was scarcely conscious of it, and let it pass as material of no immediate interest. Still more vague, and still further below his skin of mental consciousness were the dim stirrings of five hundred such homely misnomers of astronomical dignities of nomenclature. He had read about some, picked up others on subetheric programs, heard about still others in ordinary conversation, come across a few in news reports. The material might have been told him directly, or it might have been a carelessly overheard word. Even the substitution of

Triple G for *George G. Grundy* had its place in the shadowy file.

Sheffield had often questioned him about what went on in his mind—very gently, very cautiously.

"We want many more like you, Mark, for the Mnemonic Service. We need millions. Billions, eventually, if the race fills up the entire galaxy, as it will some day. But where do we get them. Relying on inborn talent won't do. We all have that more or less. It's the training that counts and unless we find out a little about what goes on, we won't know how to train."

And urged by Sheffield, Mark had watched himself, listened to himself, turned his eyes inward and tried to become *aware*. He learned of the filing cases in his head. He watched them marshal past. He observed individual items pop up on call, always tremblingly ready. It was hard to explain, but he did his best.

His own confidence grew with it. The anxieties of his childhood, those first years in Service, grew less. He stopped waking in the middle of the night, perspiration dripping, screaming with fear that he would forget. And his headaches stopped.

He watched Ilium as it appeared in the viewport at closest approach. It was brighter than he could imagine a moon to be. (Figures for albedoes of three hundred inhabited planets marched through his mind, neatly arrayed in decreasing order. It scarcely stirred the skin of his mind. He ignored them.)

The brightness he blinked at was concentrated in the vast, irregular patches that Cimon said—he overheard him, in weary response to another's question—had once been sea bottom. A fact popped into Mark's mind. The original report of Hidosheki Makoyama had given the composition of those bright salts as 78.6% sodium chloride, 19.2% magnesium carbonate, 1.4% potassium sulf—The thought faded out. It wasn't necessary.

Ilium had an atmosphere. A total of about 100 mm. of mercury—a little over an eighth of Earth's, ten times Mars, 0.254 that of Coralemon, 0.1376 that of Aurora. Idly he let the decimals grow to more places. It was a form of exercise, but he grew bored. Instant arithmetic was fifth-grade stuff. Actually, he still had trouble with integrals and wondered if that was because he didn't know what an integral was. A half dozen definitions flashed by, but he had never had enough mathematics to understand the definitions, though he could quote them well enough.

At school, they had always said, "Don't ever get too interested in any one thing or group of things. As soon as you do that, you begin selecting your facts and you must never do that. *Everything*, *anything* is important. As long as you have the facts on file, it doesn't matter whether you understand them or not."

But the noncompos didn't think so. Arrogant minds with holes in them!

They were approaching Junior itself now. It was bright, too, but in a different way. It had ice caps north and south. (Textbooks of Earth's paleoclimatology drifted past and Mark made no move to stop them.) The ice caps were retreating. In a million years, Junior would have Earth's present climate. It was just about Earth's size and mass and it rotated in a period of thirty-six hours.

It might have been Earth's twin. What differences there were, according to Makoyama's reports, were to Junior's advantage. There was nothing on Junior to threaten mankind as far as was known. Nor would anyone imagine there possibly might be were it not for the fact that humanity's first colony on the planet had been wiped out to the last soul.

What was worse, the destruction had occurred in such a way that a study of all surviving information gave no reasonable clue whatever as to what had happened.

Sheffield entered Mark's cabin and joined the boy two hours before landing. He and Mark had originally been assigned a room together. That had been an experiment. Mnemonics didn't like the company of noncompos, even the best of them. In any case, the experiment had failed. Almost immediately after take-off, Mark's sweating face and pleading eyes made privacy absolutely essential for him.

Sheffield felt responsible. He felt responsible for everything about Mark whether it was actually his fault or not. He and men like himself had taken Mark and children like him and trained them into personal ruin. They had been force-grown. They had been bent and molded. They had been allowed no normal contact with normal children lest they develop normal mental habits. No Mnemonic had contracted a normal marriage, even within the group.

It made for a terrible guilt-feeling on Sheffield's part.

Twenty years ago there had been a dozen lads trained at one school under the leadership of U Karaganda, as mad an Asiatic as had ever roused the snickers of a group of interviewing newsmen. Karaganda had committed suicide eventually, under some vague motivation, but other psychologists, Sheffield for one, of greater respectability and undoubtedly of lesser brilliance, had had time to join him and learn of him.

The school continued and others were established. One was even founded on Mars. It had an enrollment of five at the moment. At latest count, there were one hundred and three living graduates with full honors—naturally, only a minority of those enrolled actually absorbed the entire course. Five years ago, the Terrestrial planetary government—not to be confused with the Central Galactic Committee, based

on Earth, and ruling the Galactic Confederation—allowed the establishment of the Mnemonic Service as a branch of the Department of the Interior.

It had already paid for itself many times over, but few people knew that. Nor did the Terrestrial government advertise the fact, or any other fact about the Mnemonics. It was a tender subject with them. It was an "experiment." They feared that failure might be politically expensive. The opposition—with difficulty prevented from making a campaign issue out of it as it was—spoke at the planetary conferences of "crackpotism" and "waste of the taxpayers' money." And the latter despite the existence of documentary proof of the precise opposite.

In the machine-centered civilization that filled the galaxy, it was difficult to learn to appreciate the achievements of naked mind without a long apprenticeship.

Sheffield wondered how long.

But there was no use being depressed in Mark's company. Too much danger of contagion. He said, instead, "You're looking fine, sport."

Mark seemed glad to see him. He said, thoughtfully, "When we get back to Earth, Dr. Sheffield—"

He stopped, flushed slightly, and said, "I mean, supposing we get back, I intend to get as many books and films as I can on folk-ways. I've hardly read anything on that subject. I was down in the ship's library and they had nothing — absolutely nothing."

"Why the interest?"

"It's the captain. Didn't you say he told you that the crew were not to know we were visiting a world on which the first expedition had died?"

"Yes, of course. Well?"

"Because spacemen consider it bad luck to touch on a world like that, especially one that looks harmless. 'Sucker bait,' they call it."

"That's right."

"So the captain *says*. It's just that I don't see how that can be true. I can think of seventeen habitable planets from which the first expeditions never returned and never established residence. And each one was later colonized and now is a member of the Federation. Sarmatia is one of them, and it's a pretty big world now."

"There are planets of continuous disaster, too." Sheffield deliberately put that as a declarative statement.

(Never ask informational questions. That was one of the Rules of Karaganda. Mnemonic correlations weren't a matter of the conscious intelligence; they weren't volitional. As soon as a direct question was asked, the resultant correlations were plentiful but only such as any reasonably informed man might make. It was the unconscious mind that bridged the wide, unlikely gaps.)

Mark, as any Mnemonic would, fell into the trap. He said, energetically, "No, I've never heard of one. Not

where the planet was at all habitable. If the planet is solid ice, or complete desert, that's different. Junior isn't like that."

"No it isn't," agreed Sheffield.

"Then why should the crew be afraid of it. I kept thinking about that all the time I was in bed. That's when I thought of looking at the log. I'd never actually seen one, so it would be a valuable thing to do in any case. And certainly, I thought, I would find the truth there."

"Uh huh," said Sheffield.

"And, well—I may have been wrong. In the whole log the purpose of the expedition was never mentioned. Now that wouldn't be so unless the purpose were secret. It was as if he were even keeping it from the other ship officers. And the name of the ship *is* given as the *George G. Grundy.*"

"It would be, of course," said Sheffield.

"I don't know. I suspected that business about *Triple G,*" said Mark, darkly.

Sheffield said, "You seem disappointed that the captain wasn't lying."

"Not disappointed. Relieved, I think. I thought . . . I thought—" He stopped and looked acutely embarrassed, but Sheffield made no effort to rescue him. He was forced to continue, "I thought everyone might be lying to me, not just the captain. Even *you* might, Dr. Sheffield. I thought you just didn't want me to talk to the crew for some reason."

Sheffield tried to smile and managed to succeed. The occupational disease of the Mnemonic Service was suspicion. They were isolated, these Mnemonics, and they were different. Cause and effect were obvious.

Sheffield said lightly, "I think you'll find in your reading on folk-ways that these superstitions are not necessarily based on logical analysis. A planet which has become notorious has evil expected of it. The good which happens is disregarded; the bad is cried up, advertised, and exaggerated. The thing snowballs."

He moved away from Mark. He busied himself with an inspection of the hydraulic chairs. They would be landing soon. He felt unnecessarily along the length of the broad webbing of the straps, keeping his back to the youngster. So protected, he said, almost in a whisper, "And, of course, what makes it worse is that Junior is so different."

(Easy now, easy. Don't push. He had tried that trick before this and—)

Mark was saying, "No, it isn't. Not a bit. The expeditions that failed were different. That's true."

Sheffield kept his back turned. He waited.

Mark said, "The seventeen other expeditions that failed on planets that are now inhabited were all small exploring expeditions. In sixteen of the cases the cause of death was shipwreck of one sort or another and in the remaining case, Coma Minor that one

was, the failure resulted from a surprise attack by indigenous life-forms, not intelligent, of course. I have the details on all of them—"

(Sheffield couldn't forebear holding his breath. Mark *could* give the details on all of them. All the details. It was as easy for him to quote all the records on each expedition, word for word, as it was to say yes or no. And he might well choose to. A Mnemonic had no selectivity. It was one of the things that made ordinary companionship between Mnemonics and ordinary people impossible. Mnemonics were dreadful bores by the nature of things. Even Sheffield, who was trained and inured to listen to it all, and who had no intention of stopping Mark if he were really off on a talk-jab, sighed softly.)

"But what's the use," Mark continued, and Sheffield felt rescued from a horror. "They're just not in the same class with the Junior expedition. That consisted of an actual settlement of seven hundred eighty-nine men, two hundred seven women and fifteen

children under the age of thirteen. In the course of the next year, three hundred fifteen women, nine men and two children were added by immigration. The settlement survived almost two years and the cause of death isn't known, except that from their report, it might be disease.

"Now *that* part is different. But Junior itself has nothing unusual about it, except, of course—"

Mark paused as though the information were too unimportant to bother with and Sheffield almost yelled. He forced himself to say calmly, "*That* difference. Of course."

Mark said, "We all know about that. It has two suns and the others only have one."

The psychologist could have cried his disappointment. Nothing!

But what was the use. Better luck next time. If you don't have patience with a Mnemonic, you might as well not have a Mnemonic.

He sat down in the hydraulic chair and buckled himself in tightly. Mark did likewise. (Sheffield would have liked to help, but that would have been injudicious.) He looked at his watch. They must be spiraling down even now.

Under his disappointment, Sheffield felt a stronger disturbance. Mark Annuncio had acted wrongly in following up his own hunch that the captain and everybody else had been lying. Mnemonics had a tendency to believe that because their store of facts was great, it was complete. This, obviously, is a prime error. It is therefore necessary — thus spake Karaganda — for them to present their correlations to properly constituted authority and never to act upon it themselves.

Well, how significant was this error of Mark's. He was the first Mnemonic to be taken away from Service headquarters; the first to be separated from all of his kind; the first to be isolated among noncompos. What did that do to him? What would it continue to do to him? Would it be bad? If so, how to stop it?

To all of which questions, Dr. Oswald Mayer Sheffield knew no answer.

The men at the controls were the lucky ones. They and, of course, Cimon who, as astrophysicist and director of the expedition, joined them by special dispensation. The others of the crew had their separate duties, while the remaining scientific personnel preferred the relative comfort of their hydraulic seats during the spiral around and down to Junior.

It was while Junior was still far enough away to be seen as a whole that the scene was at its grandest.

North and south, a third of the way to the equator, lay the ice caps, still at the start of their millennial retreat. Since the *Triple G* was spiraling on a north-south great circle — deliberately chosen for the sake of viewing the polar regions, as Cimon, at the cost

of less than maximum safety, insisted — each cap in turn was laid out below them.

Each burnt equally with sunlight, the consequence of Junior's untilted axis. And each cap was in sectors, cut like a pie with a rainbowed knife.

The sunward third of each was illuminated by both suns simultaneously into a brilliant white that slowly yellowed westward, and as slowly greened eastward. To the east of the white sector lay another, half as wide, which was reached by the light of Lagrange I only, and the snow there blazed a response of sapphire beauty. To the west, another half-sector, exposed to Lagrange II alone, shone in the warm orange-red of an Earthly sunset. The three colors graded into one another band-wise, and the similarity to a rainbow was increased thereby.

The final third was dark in contrast, but if one looked carefully enough, it, too, was in parts — unequal parts. The smaller portion was black indeed, but the larger portion had a faint milkiness about it.

Cimon muttered to himself, "Moonlight. Of course." Then looked about hastily to see if he were overheard. He did not like people to observe the actual process by which conclusions were brought to fruition in his mind. Rather they were to be presented to his students and listeners, to all about him in short, in a polished perfection that showed neither birth nor growth.

But there were only spacemen about and they did not hear him. Despite all their space-hardening, they were fixing whatever concentration they could spare from their duties and instruments upon the wonder before them.

The spiral curved, veered way from north-south to northeast-southwest, finally to the east-west in which a safe landing was most feasible. The dull thunder of atmosphere carried into the pilot room, thin and shrill at first, but gathering body and volume as the minutes passed.

Until now, in the interests of scientific observation — and to the considerable uneasiness of the captain — the spiral had been tight, deceleration slight, and the planetary circumnavigations numerous. As they bit into Junior's air-covering, however, deceleration pitched high and the surface rose to meet them.

The ice caps vanished on either side and there began an equal alternation of land and water. A continent, mountainous on either seacoast and flat in between, like a soup plate with two ice-topped rims, flashed below at lengthening intervals. It spread halfway around Junior and the rest was water.

Most of the ocean at the moment was in the dark sector, and what was not lay in the red-orange light of Lagrange II. In the light of that sun, the waters were a dusky purple with a sprinkling of ruddy specks that thick-

ened north and south. Icebergs!

The land was distributed at the moment between the red-orange half-sector and the full white light. Only the eastern seacoast was in the blue-green. The eastern mountain range was a startling sight, with its western slopes red and its eastern slopes green.

The ship was slowing rapidly now; the final trip over ocean was done.

Next — landing!

The first steps were cautious enough. Slow enough, too. Cimon inspected his photochromes of Junior as taken from space with minute care. Under protest, he passed them among the others of the expedition and more than a few groaned inwardly at the thought of having placed comfort before a chance to see the original of *that.*

Boris Vernadsky bent over his gas-analyzer interminably, a symphony in loud clothes and soft grunts.

"We're about at sea level, I should judge," he said, "going by the value of *g.*"

Then, because he was explaining himself to the rest of the group, he added negligently, "The gravitational constant, that is," which didn't help most of them.

He said, "The atmospheric pressure is just about eight hundred millimeters of mercury which is about five per cent higher than on Earth. And two hundred forty millimeters of that is oxygen as compared to only one hundred fifty on Earth. Not bad."

He seemed to be waiting for approval, but scientists found it best to comment as little as possible on data in another man's specialty.

He went on, "Nitrogen, of course. Dull, isn't it, the way Nature repeats itself like a three-year-old who knows three lessons, period. Takes the fun away when it turns out that a water world always has an oxygen-nitrogen atmosphere. Makes the whole thing yawn-worthy."

"What else in the atmosphere?" asked Cimon, irritably. "So far all we have is oxygen, nitrogen, and homely philosophy from kindly Uncle Boris."

Vernadsky hooked his arm over his seat and said, amiably enough. "What are you? Director or something?"

Cimon, to whom the directorship meant little more than the annoyance of preparing composite reports for the Bureau flushed and said, grimly, "What else in the atmosphere, Dr. Vernadsky?"

Vernadsky said, without looking at his notes, "Under one per cent and over a hundredth of one per cent: hydrogen, helium, and carbon dioxide in that order. Under a hundredth of one per cent and over a ten thousandth of one per cent: methane, argon, and neon in that order. Under a ten thousandth of one per cent and over a millionth of a per cent: radon, krypton, and xenon in that order.

"The figures aren't very informative. About all I can get out of them is that Junior is going to be a happy

hunting ground for uranium, that it's low in potassium and that it's no wonder it's such a lovely little double ice cap of a world."

He did that deliberately, so that someone could ask him how he knew, and someone, with gratifying wonder, inevitably did.

Vernadsky smiled blandly and said: "Atmospheric radon is ten to a hundred times as high here as on Earth. So is helium. Both radon and helium are produced as by-products of the radioactive breakdown of uranium and thorium. Conclusion: Uranium and thorium minerals are ten to a hundred times as copious in Junior's crust as in Earth's.

"Argon, on the other hand, is over a hundred times as low as on Earth. Chances are Junior has none of the argon it originally started with. A planet of this type has only the argon which forms from the breakdown of K^{40}, one of the potassium isotopes. Low argon; low potassium. Simple, kids."

One of the assembled groups asked, "What about the ice caps?"

Cimon, who knew the answer to that, asked, before Vernadsky could answer the other, "What's the carbon dioxide content exactly?"

"Zero point zero one six emm emm," said Vernadsky.

Cimon nodded, and vouchsafed nothing more.

"Well?" asked the inquirer impatiently.

"Carbon dioxide is only about half what it is on Earth, and it's the carbon dioxide that gives the hothouse effect. It lets the short waves of sunlight pass through to the planet's surface, but doesn't allow the long waves of planetary heat to radiate off. When carbon dioxide concentration goes up as a result of volcanic action, the planet heats up a bit and you have a carboniferous age with oceans high and land surface at a minimum. When carbon dioxide goes down as a result of the vegetation refusing to let a good thing alone, fattening up on the good old see-oh-two and losing its head about it, temperature drops, ice forms, a vicious cycle of glaciation starts, and *voilà* —"

"Anything else in the atmosphere?" asked Cimon.

"Water vapor and dust. I suppose there are a few million airborne spores of various virulent diseases per cubic centimeter in addition to that." He said it lightly enough, but there was a stir in the room. More than one of the bystanders looked as though he were holding his breath.

Vernadsky shrugged and said, "Don't worry about it for now. My analyzer washes out dust and spores quite thoroughly. But then, that's not my angle. I suggest Rodriguez grow his cultures under glass right away. Good thick glass."

Mark Annuncio wandered everywhere. His eyes shone as he listened,

and he pressed himself forward to hear better. The group suffered him to do so with various degrees of reluctance, in accordance with individual personalities and temperaments. None spoke to him.

Sheffield stayed close to Mark. He scarcely spoke, either. He bent all his effort on remaining in the background of Mark's consciousness. He wanted to refrain from giving Mark the feeling of being haunted by himself; give the boy the illusion of freedom, instead. He wanted to seem to be there, each time, by accident only.

It was a most unsuccessful pretense, he felt, but what could he do? He *had* to keep the kid from getting into trouble.

Miguel Antonio Lopez y Rodriguez —microbiologist; small, tawny, with intensely black hair which he wore rather long, and with a reputation which he did nothing to discourage, of being a Latin in the grand style as far as the ladies were concerned—cultured the dust from Vernadsky's gas-analyzer trap with a combination of precision and respectful delicacy.

"Nothing," he said, eventually. "What foolish growths I get look harmless."

It was suggested that Junior's bacteria need not necessarily look harmful; that toxins and metabolic processes could not be analyzed by eye, even by microscopic eye.

This was met with hot contempt, as almost an invasion of professional function. He said, with an eyebrow lifted, "One gets a feeling for these things. When one has seen as much of the microcosm as I have, one can sense danger—or lack of danger."

This was an outright lie, and Rodriguez proved it by carefully transferring samples of the various germ colonies into buffered, isotonic media and injecting hamsters with the concentrated result. They did not seem to mind.

Raw atmosphere was trapped in large jars and several specimens of minor animal life from Earth and other planets were allowed to disport themselves within. None of them seemed to mind, either.

Nevile Fawkes—botanist; a man who appreciated his own handsomeness by modeling his hair style after that shown on the traditional busts of Alexander the Great, but from whose appearance the presence of a nose, far more aquiline than Alexander ever possessed, noticeably detracted—was gone for two days, by Junior chronology, in one of the *Triple G*'s atmospheric coasters. He could navigate one like a dream and was, in fact, the only man outside the crew who could navigate one at all, so he was the natural choice for the task. Fawkes did not seem noticeably overjoyed about that.

He returned, completely unharmed and unable to hide a grin of relief. He submitted to irradiation for the sake

of sterilizing the exterior of his flexible air-suit—designed to protect men from the deleterious effect of the outer environment where no pressure differential existed; the strength and jointedness of a true spacesuit being obviously unnecessary within an atmosphere as thick as Junior's. The coaster was subjected to a more extended irradiation, and pinned down under a plastic cover-all.

Fawkes flaunted color photographs in great number. The central valley of the continent was fertile almost beyond Earthly dreams. The rivers were mighty, the mountains rugged and snow-covered—with the usual pyrotechnic solar effects. Under Lagrange II alone, the vegetation looked vaguely repellant, seeming rather dark, like dried blood. Under Lagrange I, however, or under the suns together, the brilliant, flourishing green and the glisten of the numerous lakes—particularly north and south along the dead rims of the departing glaciers—brought an ache of homesickness to the hearts of many.

Fawkes said, "Look at these."

He had skimmed low to take a photochrome of a field of huge flowers, dripping with scarlet. In the high-ultraviolet radiation of Lagrange I, exposure times were of necessity extremely short and despite the motion of the coaster, each blossom stood out as a sharp blotch of strident color.

"I swear," said Fawkes, "each one of those was six feet across."

They admired the flowers unrestrainedly.

Fawkes then said, "No intelligent life whatever, of course."

Sheffield looked up from the photographs, with instant sharpness. Life and intelligence, after all, were by way of being his province. "How do you know?"

"Look for yourself," said the botanist. "There are the photos. No highways, no cities, no artificial waterways, no signs of anything man-made."

"No machine civilization," said Sheffield. "That's all."

"Even ape-men would build shelters and use fire," said Fawkes, offended.

"The continent is ten times as large as Africa and you've been over it for two days. There's a lot you could miss."

"Not as much as you'd think," was the warm response. "I followed every sizable river up and down and looked over both seacoasts. Any settlements are bound to be there."

"In allowing seventy-two hours for two eight-thousand-mile seacoasts ten thousand miles apart, plus how many thousand miles of river, that had to be a pretty quick lookover."

Cimon interrupted, "What's this all about? *Homo sapiens* is the only intelligence ever discovered in the galaxy through a hundred thousand and more explored planets. The chances of Troas possessing intelligence is virtually nil."

"Yes?" said Sheffield. "You could use the same argument to prove there's no intelligence on Earth."

"Makoyama," said Cimon, "in his report mentioned no intelligent life."

"And how much time did he have? It was a case of another quick feel through the haystack with one finger and a report of no needle."

"What the eternal universe," said Rodriguez, waspishly. "We argue like madmen. Call the hypothesis of indigenous intelligence unproven and let it go. We are not through investigating yet, I hope."

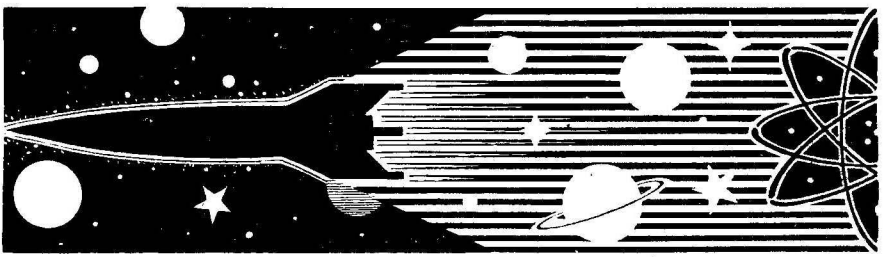
Copies of those first pictures of Junior's surface were added to what might be termed the open files. After a second trip, Fawkes returned in more somber mood and the meeting was correspondingly more subdued.

New photographs went from hand to hand and were then placed by Cimon himself in the special safe that nothing could open short of Cimon's own hands or an all-destroying nuclear blast.

Fawkes said, "The two largest rivers have a generally north-south course along the eastern edges of the western mountain range. The larger river comes down from the northern ice cap, the smaller up from the southern one. Tributaries come in westward from the eastern range, interlacing the entire central plain. Apparently, the central plain is tipped, the eastern edge being higher. It's what ought to be expected maybe. The eastern mountain range is the taller, broader and more continuous of the two. I wasn't able to make actual measurements, but I wouldn't be surprised if they beat the Himalayas. In fact, they're a lot like the Wu Ch'ao range on Hesperus. You have to hit the stratosphere to get over them, and rugged—Wow!

"Anyway," he brought himself back to the immediate subject at hand, with an effort, "the two main rivers join about a hundred miles south of the equator and pour through a gap in the western range. They make it to the ocean after that in just short of eighty miles.

"Where it hits the ocean is a natural spot for the planetary metropolis. The trade routes into the interior of the continent have to converge there so it would be the inevitable emporium for



space-trade. Even as far as surface trade is concerned, the continental east coast has to move goods across the ocean. Jumping the eastern range isn't worth the effort. Then, too, there are the islands we saw when we were landing.

"So right there is where I would have looked for the settlement even if we didn't have a record of the latitude and longitude. And those settlers had an eye for the future. It's where they set up shop."

Novee said in a low voice, "They thought they had an eye for the future, anyway. There isn't much left of them, is there?"

Fawkes tried to be philosophic about it. "It's been over a century. What do you expect? There's a lot more left of them than I honestly thought there would be. Their buildings were mostly prefab. They've tumbled and vegetation has forced its way over and through them. The fact that the climate of Junior is glacial is what's preserved it. The trees—or the objects that rather look like trees—are small and obviously very slow-growing.

"Even so, the clearing is gone. From the air, the only way you could tell there had once been a settlement in that spot was that the new growth had a slightly different color and . . . and, well, *texture*, than the surrounding forests."

He pointed at a particular photograph. "This is just a slag heap. Maybe it was machinery once. I think those are burial mounds."

Novee said, "Any actual remains? Bones?"

Fawkes shook his head.

Novee said, "The last survivors didn't bury themselves, did they?"

Fawkes said, "Animals, I suppose." He walked away, his back to the group. "It was raining when I poked my way through. It went *splat*, *splat* on the flat leaves above me and the ground was soggy and spongy underneath. It was dark, gloomy— There was a cold wind. The pictures I took don't get it across. I felt as though there were a thousand ghosts, waiting—"

The mood was contagious.

Cimon said, savagely, "Stop that!"

In the background, Mark Annuncio's pointed nose fairly quivered with the intensity of his curiosity. He turned to Sheffield, who was at his side, and whispered, "Ghosts? No authentic case of seeing—"

Sheffield touched Mark's thin shoulder lightly. "Only a way of speaking, Mark. But don't feel badly, that he doesn't mean it literally. You're watching the birth of a superstition, and that's something, isn't it?"

A semi-sullen Captain Follenbee sought out Cimon the evening after Fawkes' second return, and said in his harumphy way, "Never do, Dr. Cimon. My men are unsettled. Very unsettled."

The port-shields were open. La-

grange I was six hours gone, and Lagrange II's ruddy light, deepened to crimson in setting, flushed the captain's face and tinged his short gray hair with red.

Cimon, whose attitude toward the crew in general and the captain in particular was one of controlled impatience, said, "What is the trouble, captain?"

"Been here two weeks, Earth-time. Still no one leaves without suits. Always irradiate before you come back. Anything wrong with the air?"

"Not as far as we know?"

"Why not breathe it then?"

"Captain, that's for me to decide."

The flush on the captain's face became a real one. He said, "My papers say I don't have to stay if ship's safety is endangered. A frightened and mutinous crew is something I don't want."

"Can't you handle your own men?"

"Within reason."

"Well, what really bothers them? This is a new planet and we're being cautious. Can't they understand that?"

"Two weeks and still cautious. They think we're hiding something. And we are. You know that. Besides, surface leave is necessary. Crew's got to have it. Even if it's just on a bare rock a mile across. Gets them out of the ship. Away from the routine. Can't deny them that."

"Give me till tomorrow," said Cimon, contemptuously.

The scientists gathered in the observatory the next day.

Cimon said, "Vernadsky tells me the data on air is still negative, and Rodriguez has discovered no airborne pathogenic organism of any type."

There was a general air of dubiety over the last statement. Novee said, "The settlement died of disease. I'll swear to that."

"Maybe so," said Rodriguez at once, "but can you explain how? It's impossible. I tell you that and I tell you. See here. Almost all Earth-type planets give birth to life and that life is always protein in nature and always either cellular or virus in organization. But that's all. There the resemblance ends.

"You laymen think it's all the same; Earth or any planet. Germs are germs and viruses are viruses. I tell you, you don't understand the infinite possibilities for variation in the protein molecule. Even on Earth, every species has its own diseases. Some may spread over several species but there isn't one single pathogenic life form of any type on Earth that can attack all other species.

"You think that a virus or a bacterium developing independently for a billion years on another planet with different amino-acids, different enzyme systems, a different scheme of metabolism altogether, is just going to happen to find *Homo sapiens* succulent like a lollipop. I tell you it is childishness."

Novee, his physician's soul badly pierced at having been lumped under the phrase, "you laymen," was not disposed to let it go that easily. "*Homo sapiens* brings its own germs with it wherever it goes, Rod. Who's to say the virus of the common cold didn't mutate under some planetary influence into something that was suddenly deadly. Or influenza. Things like that have happened even on Earth. The 2755 para-meas—"

"I know all about the 2755 para-measles epidemic," said Rodriguez, "and the 1918 influenza epidemic, and the Black Death, too. But when has it happened lately? Granted the settlement was a matter of a century and more ago; still that wasn't exactly pre-atomic times, either. They included doctors. They had supplies of antibiotics and they knew the techniques of antibody induction. They're simple enough. And there was the medical relief expedition, too."

Novee patted his round abdomen and said, stubbornly, "The symptoms were those of a respiratory infection; dyspnea—"

"I know the list; but I tell you it wasn't a germ disease that got them. It couldn't be."

"What was it, then?"

"That's outside my professional competence. Talking from inside, I tell you it wasn't infection. Even mutant infection. It couldn't be. It *mathematically* couldn't be." He leaned heavily on the adverb.

There was a stir among his listeners as Mark Annuncio shoved his thin body forward into the space immediately before Rodriguez.

For the first time, he spoke at one of these gatherings.

"*Mathematically?*" he asked, eagerly.

Sheffield followed after, his long body all elbows and knees as he made a path. He murmured "Sorry" half a dozen times.

Rodriguez, in an advanced stage of exasperation thrust out his lower lip and said, "What do *you* want?"

Mark flinched. Less eagerly, he said, "You said you knew it wasn't infection mathematically. I was wondering how . . . mathematics—" He ran down.

Rodriguez said, "I have stated my professional opinion."

He said it formally, stiltedly, then turned away. No man questioned another's professional opinion unless he was of the same specialty. Otherwise the implication, clearly enough, was that the specialist's experience and knowledge was sufficiently dubious to be brought into question by an outsider.

Mark knew this, but then he was of the Mnemonic Service. He tapped Rodriguez's shoulder, while the others standing about listened in stunned fascination, and said, "I know it's your professional opinion, but still I'd like to have it explained."

He didn't mean to sound peremptory. He was just stating a fact.

Rodriguez whirled. "You'd like to have it explained? Who the eternal Universe are *you* to ask me questions."

Mark was startled at the other's vehemence, but Sheffield had reached him now, and he gained courage and with it, anger. He disregarded Sheffield's quick whisper and said shrilly, "I'm Mark Annuncio of Mnemonic Service and I've asked you a question. I want your statement explained."

"It won't be explained. Sheffield, take this young nut out of here and tuck him into bed, will you? And keep him away from me after this. Young jackass." The last was a clearly-heard aside.

Sheffield took Mark's wrist but it was wrenched out of his grasp. The young Mnemonic screamed, "You stupid noncompos. You . . . you moron. You forgettery on two feet. Sieve-mind. Let me *go*, Dr. Sheffield — You're no expert. You don't remember anything you've learned, and you haven't learned much in the first place. You're not a specialist; none of you—"

"For space's sake," cried Cimon, "take the young idiot out of here, Sheffield."

Sheffield, his long cheeks burning, stopped and lifted Mark bodily into the air. Holding him close, he made his way out of the room.

Tears squeezed out of Mark's eyes and just outside the door, he managed to speak with difficulty. "Let me down, I want to hear — I want to hear what they say."

Sheffield said, "Don't go back in. Please, Mark."

"I won't. Don't worry. But—"

He didn't finish the but.

TO BE CONCLUDED

PURELY COINCIDENCE, NO DOUBT

Sometimes peculiar consistencies appear around us; they may be true patterns, or merely accidental conglomerations. Here's a set of odd items from a number of fields:

1. Atomic physicists now know of atoms having atomic weights ranging from 1 to more than 240. But there is one, and only one mass-number that is *not* occupied. No nucleus has *five* particles.
2. Crystallographers say that no crystal can have pentagonal symmetry.
3. Topologists find that no plane or spherical map needs more than four colors.
4. Two soap-bubbles intersect to form a plane of interaction. Three interact on a line of meeting. Four meet at a point. Five can't meet.
5. According to Bode's law, there should be a planet between Mars, the fourth planet, and Jupiter, the sixth. Instead, there's shattered debris.
6. Life is distinguished from the non-living in that life exists only so long as it is *un*stable.
7. A starfish has pentagonal symmetry. Man is basically pentagonal; and originally all higher land-life had five-digited limbs.
8. Magic, down the centuries, held the pentagon and the pentacle (five-pointed star) had mystic power.

What's peculiar about the number Five?

THE EDITOR.

RUNAWAY HOME

BY E. G. VON WALD

With the interstellar ships, you could run away from any mistake—except the mistake of running away!

He found himself staring at her, wondering whether the dim shadows visible under her eyes were natural, or whether natural and dark shadows had been incompletely obscured. Her face was delicate and regular, as if there had been some high-class adjustments made on it by a well-paid surgeon. Her whole body, for that matter, looked thoroughly adjusted and very pleasant indeed.

Deitrich was fascinated.

As if some extrasensory link had been established, she glanced abruptly over at him; and as abruptly looked away again, with a faint coloring of

her pale, blond skin. Then she walked quickly on past and was lost in the crowd.

Deitrich's gaze moved back to the stiff, watchful immigrants that he had brought in with him. They stood in a tight knot, staring around at the glittering room, their eyes attentive and wary.

It was too noisy, with the port customs officers moving through the throng, shouting and trying to keep from losing their particular charges. The charges, however, chattered among themselves and seemed more interested in breaking away to watch the moving kaleidoscope of pictures that blossomed on all sides, heralding the wondrous marvels that might be purchased or enjoyed on this singularly fortunate planet.

His immigrants obviously were nervous and a little afraid. That was normal. To them, it seemed that only a couple of days had elapsed since they had left the quiet, restrained port of Bella III, deep in the sophisticated Cluster of Madgellan. Perhaps they were a little shocked at the confusion of this place. For these immigrants were not the government-subsidy variety; they were educated and had some money, or they would not have been allowed to come into this system.

Despite full instructions to the contrary, however, they probably still felt that if they did not like it here, they could return tomorrow to Bella III, and resume the life they had rejected. The emotional habits of a culture die slowly in the individual.

An official approached the group. He glanced at Deitrich. He studied the immigrants carefully and looked again toward Deitrich. Finally he walked over to where he stood.

"You are in charge of these people?"

Deitrich nodded, and the man consulted some records on his arm. "I do not seem to find—" he started, frowned and changed his approach. "Luggage? Equipment?" A tired officiousness labored his voice, as he asked the familiar questions he asked a hundred times every day.

"I left all that on the tender," Deitrich explained. "I saw no point in unloading them until we have a place to send them."

"Ah, but—"

"Don't you have a hotel inspection service in this system any more?" Deitrich asked.

"Of course." The man peered intently at Deitrich, studying the uniform. "You . . . ah—" and he cleared his throat again.

"We just came in from the Home."

"Oh." There was a small apologetic laugh. "Of course. For a moment I was puzzled by your uniform." He turned and pointed at the distant end of the anteroom. "You must report to the subcommissioner. He handles all extrasystemal traffic personally."

Deitrich walked in the direction indicated, weaving his way through the undulating mass of humanity. Some of the people stared at him; others glared as he thrust his way among them. Most paid no attention, having seen often and tired of the novelty of oddly-attired strangers.

He came to a door with official-looking symbols on it. This, he decided, must be the place.

It was. It was more. He found himself suddenly faced again with the telesensitive blonde. But this time, instead of the blush, she had a cool, superior smile on her face.

"Hello," she said. Her eyes swept up and down his uniform curiously. "You wish to see the commissioner?"

Deitrich nodded. He handed her the capsule of the squad tape, along with his personal identification capsule.

"Just one moment, sir," she said. "I'll decode this immediately." She left her seat and proceeded to the rear corner of the room, glancing at the personal capsule a moment before inserting it into the machine.

"Extrasystemal, I see," she commented. "How does it feel to be back in time again, commander?"

"Not commander," Deitrich corrected her. "Captain." Then he added politely, "Fine."

The woman turned her head and smiled briefly, showing even white teeth. "I guess you're rather tired of answering that one, captain."

Deitrich returned the smile without comment and waited.

As she manipulated the machine, she softly hummed an obscure but vaguely familiar melody. But before Deitrich could put his finger on what about it pleased him so much, there came a smothered mutter and clacking, and out popped a little plastic coupon.

"There we are," she murmured. She returned slowly, reading it aloud as she walked. "Captain Fritz Deitrich, XM39La Home Galaxy Fleet code—" Her voice trailed off, lips still moving as she continued silently reciting the designation of the fleet, origin and destination, and the pilot commission data. As she came to the end her eyes widened, and she looked sharply up at him.

"Terra!" she exclaimed. "Third century."

Deitrich nodded agreeably. It was, he knew, a long ways away and a long time ago. He was used to a certain amount of surprise at this circumstance.

"B-but—" she stammered excitedly. "But that's my time!"

Now it was his mouth that dropped open with astonishment.

"And my planet!"

He stared at her. "Where?" he asked. "When?"

"Rioessay. And I was born in 310."

Eagerly they clasped hands. He

smiled a little twisted grin as he said, "Rioessay? That was the capital once, wasn't it?"

"Oh, yes, but way before my time." Her eyes sparkled with hungry joy. "Our time," she corrected.

"I knew I'd heard of it somewhere." He paused and the grin righted itself and spread. "Well, what do you know about this."

They still held hands. Her gaze darted from his face to his uniform and back to his face again, her eyes moist and shining. "Imagine," she breathed, "meeting way out here. Oh-h-h." She shook her head. "You don't know."

"I know," Deitrich murmured.

She looked down again and with a little embarrassed giggle, disengaged her hand. Trying to regain her composure she said stiffly, "It's been so . . . so long, you know."

"I know," said Deitrich quietly. "But I was beginning to think there weren't any of us left any more."

"Uh huh."

"How long have you been here?"

"Not too long," she replied. "But it's been a long time for me. It was . . . . let's see . . . almost four years now."

"Oh." Deitrich was surprised. But of course it could not have been very long. "Where did you spend the rest of the time since you left Terra?"

"Here and there. I went all around the Home." Her cheeks dimpled again. "Sort of a sightseeing tour. But I spent all my money, and finally had to quit and get a job. That's why I moved on out here. It was my last run."

Deitrich watched her with gentle amusement. Four years was a long time in one place after all the time-jumping she mentioned. A passing sadness clouded his eyes momentarily. Then he smiled again. "You like it here?"

"About as well as any place I can go. And a good bit better than some places I've been."

"Yes, I imagine so." He hesitated and added, "Well, we'll have to get together often while I'm here in the system."

"Yes," she replied, but it sounded a little uncertain. Then she repeated again, with insistence, "Four years I've been here. I like it very much."

"Naturally." Deitrich picked up his identification coupon from the floor where she had dropped it. "Right now I believe I must see the commissioner."

The man he met had never left his native system. He saw TJ pilots come in every few months, and had been doing this work for sixty years. He glanced at Deitrich's coupon with a blasé casualness.

"Captain Deitrich," he murmured. "You're the Home fleet that has just taken up its orbit."

"Yes, sir."

"Fine. Make yourself comfortable there," the man indicated a seat. "Can I get you some refreshment?"

"Thank you," Deitrich replied politely, "but I'm a little concerned about the strangers I brought in with me. Immigrants."

"Oh? Visitors? Immigrants?" The commissioner frowned, and his eyes almost disappeared in the flesh that surrounded them. He moved thick, soft fingers over a patch of control buttons. "See that Captain Deitrich's passengers are cleared immediately," he ordered. Then he looked back at Deitrich. "Is that fast enough for you, captain?"

Deitrich nodded and grinned. "Fine."

"I'm taking your word that they fulfill the requirements for entrance into this system."

"That was all handled back at Bella III."

"Good. Now, captain, would you care for that drink?" At Deitrich's nod, he asked, "What will you have, oonalyn? Betelgeuse? They're very good."

"Oonalyn," Deitrich replied. "I know what effect it has."

"Then you should try the betelgeuse, captain."

The drink was brought by a shiny blue automaton that ran on five wheels and had nine pentadactyl-ended tentacles. The commissioner eyed the machine proudly as it served them. "We're not so far behind them at that, are we?"

Deitrich agreed with the man, although he knew that by this time the Home had considerably superior devices to this. But the Eighteen Planet System could not truthfully be called backward in many respects. Situated as it was, with its huge sun moving lazily along not quite halfway between Home Galaxy and M33, it became a natural trading post between them. Technically, it belonged to the Home Galaxy, but only technically. One hundred and seventy running years of distance had proved to be just too far to exert any political control.

And, operating as an independent and growing monopoly, the lonely system had gorged itself on the trade between the Home and its populous farther colonies. Culture, considered as purchasable a commodity as any other, was liberally imported from wherever it was obtainable. Every luxury and technological advance had to pass through there on its way to the hungry markets in either direction. The Eighteen Planets thrived upon it.

The commissioner sipped his wine and brushed his heavy lips delicately. "Deitrich," he mused. "I seem to remember my grandfather speaking of a time-jump pilot by that name." He looked again at the identification coupon. "I believe that you must be the man."

"Very likely," Deitrich replied.

"I was in here about that period."

"My name is Stek," the commissioner said, laughing. He spelled it out. "I don't suppose that brings anything to mind?"

"Stek?" Deitrich repeated uncertainly. He considered for a moment and then said, "I believe there was a young man by that name." He thought a moment and then nodded vigorously. "Certainly. He was a young customs clerk here who had ambitions to become a TJ pilot. He pestered me to death talking about it." Deitrich grinned. "I see he didn't go."

"No, he didn't, captain. He spoke of you as the one who advised him against it in no uncertain terms. He took your word for it. And later, after he became commissioner—that was when I knew him—he had seen enough to realize that you were right."

"I'm glad of that."

"Yes. He was very grateful for the advice. And I guess I wouldn't be here either if he hadn't talked to you. More oonalyn?" Deitrich shook his head, so Stek helped himself and then asked cheerfully, "What sort of cargo do you carry this time?"

"It's all on the squad tape, of course. There are those fifty immigrants that you have already cleared. Two cylinders of a new drive mechanism for planetary craft."

"Sealed units?"

Deitrich shrugged. "I suppose," he murmured. "I didn't check into that."

"Good. The technicians who unload such material sometimes like to tinker with exposed machinery. Generally speaking they don't know what they're doing with Home devices and smash some of them. What else?"

"The usual transcripts, communications, technical literature. And . . . oh, well. There are two hundred cylinders in all, and I must admit

that I didn't bother too much with it." He laughed. "I still would have had to carry them. And the credit you establish for the Home on the basis of the shipment is entirely in your hands anyway."

"Well," said the commissioner, "you'll find that we shall exhibit our customary generosity."

"Makes no difference to me, as long as you don't disturb the two through-cylinders. They're loaded with subsidy colonists."

Alarm showed on Stek's face. "They're not free, are they?"

"No. They are still phased out of time—in stasis or however you call it here. That's why I don't want them disturbed. They're bound for the frontier."

Satisfied, Stek replied, "We'll not bother them, captain. It wouldn't do to set a lot of Federation-supported tramps loose in the Eighteen Planets."

"Well—" Again Deitrich shrugged his disclaimer of interest. "Your restrictions are your privilege."

"At least, so it has always been." Stek considered a moment and then said, "But we never can be too sure when the Home will try to make us change them. By the way, how is the situation back there?"

"About the same as usual," Deitrich told him blandly. "Bit of a squabble out in the coal sack region. Seems somebody got hold of a new weapon and threatened to use it. I guess you got some information on that from the last transport."

Stek waggled his many chins in affirmation. He asked, "Have they settled it?"

"They did it very simply, because the weapon wasn't so new after all. The Home Federation had discovered it a century before, but kept it secret. They used it on the rebels."

"Was it really an annihilator?" Stek asked in a quick, low voice.

"Yes. The coal sack is a little bigger now."

Stek looked down at the field of buttons on his desk, and pensively caressed them with his fat hand. "That is an awful power to have," he murmured soberly.

"Judging by the fact that the Home had it a full century before they used it, I'd say that it is in pretty reasonable hands."

"I agree. But in another century somebody else is going to be running things there. They may not be so reasonable."

Deitrich grinned wryly. "Those are things I don't like to think about much. But it shouldn't affect you, personally," he added, "unless you take up time-jumping."

"No thank you, captain," Stek said. "Would you care for another oonalyn?"

"I think I better get on with my business here," Deitrich replied apologetically.

Stek acquiesced. "I suppose so. Incidentally, we have provided the TJ commission with a new building. I think you'll like it, captain. There is a permanent secretary for the pilots in the system, which you should find a convenience." He smiled and said, "When we first hired her, she thought you pilots operated time machines."

"That's not uncommon among the secondary classes."

"Yes. At any rate, she treats all of you as if you were the same man, so don't be surprised. I believe she regards it as her personal joke."

They had done a nice job, Deitrich thought. The new building was located in a government vegetation preserve, and had about as much beauty and luxury as was available anywhere in the system. And that was considerable.

As he entered his office, the secretary glanced up at him and raised a finger. Then, in a time-honored gesture, she pointed it to her head.

"Inside," she said cryptically.

"You'll have to give me a better clue than that," Deitrich protested. "After all, I just got here."

She frowned with annoyance, but she explained. "I couldn't keep him out. Said you were the only one who could help him and that it was practically a matter of life and death."

Deitrich nodded doubtfully and went on into the inner office.

A short, muscular man jumped to his feet with a clatter of hard plastic sandals. His clothing indicated that he was a lower-class merchant, which was somewhat surprising to Deitrich because a lower-class man like that could hardly be involved with a TJ transport. The only exception would be as a subsidy-colonist, and the Eighteen Planets never shipped any of those.

"I'm sorry to bother you sir, but my wife thought you might be able to—" The man hesitated and nervously fingered the tassels on his blouse.

"What's your name?"

"Tsuroak, sir."

Deitrich motioned, and they both sat down. Tsuroak continued to fool with the yellow-corded tassel.

"And what is the trouble?"

"It's my son."

"I see. And what is it about your son that you think I can help you with?"

"He's run away, sir."

Deitrich waited.

Tsuroak dropped the tassel, cleared his throat and continued more resolutely.

"He . . . we, that is . . . had an argument of sorts and he ran away. Took a time-jump ship somewhere. We aren't exactly sure just where." The man leaned forward. "But he's only twenty-seven, sir."

Deitrich frowned. "It's against the

law to take a passenger on an intergalactic transport who is under legal age. Have you notified the authorities? There may still be time to intercept it."

The man leaned back in his chair. He shook his head disconsolately.

"He left six months ago. There was a note, but we didn't believe that he would actually do anything like that." He gestured hopelessly. "We thought he'd be hiding some place here in the Eighteen Planets."

Deitrich waited again.

"We've come to the conclusion that he's left the system."

After allowing the proper pause, Deitrich said, "That's too bad. But—what can I do about it?"

Tsuroak rubbed his hands together, thick, tough, heavily-veined skin whitening from the pressure. "It was just a silly argument," he said. "I had no idea—Sir, they tell me that you are the only time-jump pilot in the system right now. I . . . that is, my wife and I . . . thought that maybe you could go up and get him and explain things to him a little bit. And bring him back."

"I'm afraid—" Deitrich started, but the little merchant interrupted him immediately.

"I can pay you, sir. Not too much, I guess. But something. Maybe a lot if you'll just wait a few years."

Deitrich shook his head. "I'm sorry, Tsuroak. Money is not the question. What I wanted to say was that you seem to be under a rather popular misconception. A time-jump transport moves in time, as its name indicates. But only one way. Forward. As far as I know, nobody has ever been able to go the other way. Perhaps in the future."

Tsuroak protested mildly. "But how do you travel so far and get back again. The stars—"

"When a time-jump leaves the Eighteen Planets System," Deitrich replied, "you will never see it again in your lifetime. It is run simply on a basis of suspended animation. You set the course, punch out a control code, and all of a sudden you find yourself at your destination. But actually you've been unconscious for the entire trip, even if it takes a thousand years. It's called a time-jump because subjectively you are not affected by the passage of time."

The little man's heavy shoulders sagged. His face showed his disappointment, and he murmured, "I told her that it wasn't like she thought." He paused, meditated briefly, and then said, "So he's gone. We'll never see him again."

Deitrich watched, keeping his face devoid of expression. He said, "Three intergalactic transports have left here during the past six months. Do you have any idea at all where he went?"

"My wife thinks he went out to M33 Galaxy. He talked about going there at times."

"That's about two hundred years away." Deitrich pursed his lips. "Of course, there is a way that you can see your son again. And that is to take a transport to M33 yourself and look for him there. We can trace the destination of the fleet he left on, and you can get within regular transport distance of him. But the chances of finding him there are still no better than the police methods of the system he terminates at."

"But it is possible?"

"It is. However, while you are considering it, don't forget that if you follow him, anything you leave behind you will be left behind for good. No coming back to see your relatives and friends. If you don't take your family with you, by the time you get back your name may have evolved into something you might not recognize, because four hundred years or so is a long time to be away. Do you understand what I'm saying? You might as well die as far as anything or anybody left behind is concerned."

Tsuroak nodded dumbly, and Deitrich continued.

"The brighter side of it is that things are pretty stable, even over such igreat spans—as a whole, that is. Barrng accident, you should be able to start over again wherever you terminate, although you will have to spend some time adjusting yourself to the local conditions. There is a time lag in development, you see, that exists for the destination as well as it does for you. Wherever you may go in M33 is probably about two hundred years behind us here as of this point in absolute time, if such a thing existed. There are certain shifts that are unpredictable. But they are relatively mild, at least as you go outward from the home. The other way would be much harder."

"Is it—costly?" Tsuroak asked hesitantly.

"Since it was a government error that allowed your son to slip through, I think I can arrange it to have the government pay for your entire trip. You can take your immediate family and any reasonable amount of personal effects. And of course, standard intergalactic exchange credits for your money."

Tsuroak stared at him uncertainly. "I have a small business," he murmured. "Four other children—he was the oldest. My wife."

Deitrich did not interrupt.

"I just don't know. I'm fifty-two. It'll be kind of hard starting over again with my life already pretty close to half over."

"Well, you don't have to make up your mind right now. I'll be piloting the next intergalactic transport out that way, and it won't leave for at least a month yet. You have plenty of time to think it over."

Tsuroak struggled with himself a moment and then blurted out, "Would you go if you were me?"

His eyes were fixed anxiously on Deitrich's face.

"You'll have to make up your own mind, Tsuroak. I merely pointed out some of the considerations involved."

"Oh." The little man gazed blankly at him.

"A month," Deitrich repeated kindly. "Not a minute."

Tsuroak nodded and smiled for the first time. "Of course," he said and stood up. "It's a big decision to make, isn't it?"

"Yes, it is."

"I don't know how to thank you for your help. I'll talk it over with my wife and let you know."

"Fine."

For some minutes after he left, Deitrich stared at the ceiling, trying to think of nothing, absolutely nothing. He had seen the Tsuroak sort of thing happen before, one way or another. It was the tragic reason for the careful regulation of the big fleets. But sometimes men were bribed. Sometimes they were stupid or just careless.

There is one fixture that time-jumping has installed in every civilized system, and that is the TJ club, or its equivalent. These organizations were the outgrowth of the fractional trickle of population that for one reason or another found itself dislocated not only from its native land, but also from its whole native culture. It was there that the quiet, awed and homesick travelers went out of a hunger for the familiar. And if they did not usually find much of the familiar at a TJ club, at least they had the hope of it.

Deitrich sat in a booth, moodily listening to the music. There was a woman perched on the bar, and in a low, haunting voice she sang strains of age-old melodies. It was soothing, despite the fact that he had never heard them before. But he noticed that many of the patrons that night must have recognized them, because there was a hush the minute she started. A waiter brought him a bottle of good oonalyn wine and two glasses, and Deitrich was content to wait.

She came into the room hesitantly, looking around at the scattering of immigrants, and the few older residents who had not yet given up the tired habit of the place. Deitrich watched her. Finally she saw him, and came on over to the booth.

He got slowly to his feet, smiling. "I was wondering if I had missed you."

"You weren't here last night," she said accusingly.

"At the subcommissioner's office, you practically said that you wouldn't see me. Afraid it would upset you, I suppose."

She nodded and sat down opposite him. "I guess you know what I meant."

"Sure. You've settled down. But you still haven't quite accepted it."

She sighed. Deitrich poured her some wine. "Have you ever been back?" she asked him.

"Several times."

"How was it?"

"About as I expected. At least, it was about as I expected after I got to know what to expect. The first time it wasn't so different, because I had been gone only about thirty years. But the last time I had to take a language course before I could understand what they were talking about."

"I never went back," she said. "Just kept on going. Sometimes I was ahead of the local age, sometimes behind. Generally a little behind."

"That's why you started moving farther out, trying to catch up."

"Yes. I'd have gone out to the colonies, but I ran out of money."

He leaned back and nodded. "That's what they all do. Somehow, no matter which way you go, you always seem to lag a little behind the popular culture of your destination. But it wouldn't solve it if you went out to the colonies," he said. "The colonies wouldn't be quite so far ahead of you in the things you know, but they'd be just as different as the rest. They all develop a little differently."

"I imagine so."

"I don't just imagine it." He paused and sipped his wine. "You know what?" he said and she looked at him attentively. "I don't even know your name."

She burst out laughing. "Sara McGee," she told him.

He repeated it slowly, tasting the familiar sound of the words. "That's a very nice name, Sara."

"Most people can't understand it any more. I've been thinking of changing it."

"Don't," he begged. "It's too nice."

She laughed again, but it faded as her gaze darted out across the room. "I used to come here all the time," she murmured. "Until it got sort of depressing." The singer at the bar held a long sad note. "They're all so . . . so lonesome," she breathed.

He slowly drank his wine and made an approving face. Then he said gently, "Certainly they're all lonesome, Sara. Or homesick would be the word if they have some of their family or friends with them. But as you say, it's lonesome if they came by themselves."

"Don't you get lonesome?" she asked.

"Yes. But you can get used to being lonesome, too. Your attitude changes to accommodate the situation if the situation becomes chronic."

"Wouldn't it be easier if you made the shorter runs they have back in the Home? Between local systems, I mean?"

He shrugged. "Perhaps. When I

first started this business though, the ships went a lot slower than they go now. The average short-run was anywhere from thirty to forty years. Other runs were as much as sixty or seventy between the local systems.

"After sixty years," he said, "all your family and friends are very old, dying if not dead. And coming back just at that time makes you feel bad. But it's not half so bad as coming back after thirty years or so, and finding that they haven't aged quite enough to be resigned to it. Then you become a positive and glaring indication that they are older than they let themselves think."

"That never happened to me."

Deitrich gazed at her, feeling the wine warm his stomach and ease the bitter discipline. Nostalgia began to creep over him. "It's a mess, isn't it?"

She asked, "You want to know how I got into it?"

"That's up to you. But I know you didn't just come out to see the sights, like you said you did."

"No. Not really."

Deitrich waited. He refilled his own glass, and then, as she finished, hers. She took a deep breath and spread her hands on the table. She studied them intently.

"I was just a kid, you know. Twenty-four. But that was before

they raised the legal age in the Home Galaxy to thirty. So they couldn't stop me from going."

She looked up and forced a laugh. "They should have done it sooner." Deitrich just smiled back at her and shrugged. "There was a man . . . boy, I should say, because he was no older than I." Back to the study of her fingernails again. "I married him. It was a mistake."

"So you ran away."

"Uh huh." She nodded and looked up again, half defiantly.

"Was he a jerk?"

"No. He was all right. I was the jerk."

Deitrich sipped his wine. "Don't feel so bad about it, Sara," he said. "Don't feel so bad about running away. The universe is full of people who are running away all the time."

"Oh, I know," she replied. "I've got over it. I'm a full forty-six now—subjectively. But you were curious. So I told you."

The woman on the bar had stopped singing and gone away. From somewhere a weird orchestra was playing tunes from the outer colonies.

"Now you tell me what you ran away from," she said.

"Me?" Deitrich mused. "Nothing. I was just a crazy kid. It was the new thing, very marvelous. The pay was much better than you could get anywhere else with my experience, so I signed up." He smiled wistfully. "You should have seen me strut the first time I got back. All my old buddies were middle-aged by then, and I was still the cocky kid. It must have taken me a week to realize that they wouldn't have a thing to do with me."

She gazed at him over the rim of her wineglass. He watched the faint creasing of tired lines around her eyes as she smiled. He grinned happily back at her.

There was more wine, and they sat there, talking the language of their own time, stumbling occasionally on the half-forgotten constructions, and laughing delightedly at the jokes that were laughed at then. Although their spheres of activity had been so diverse that neither actually could recall anyone that was personally known to both, it was enough that they both knew the same world. They reviewed the minor catastrophes that had been so important. A half-remembered fragment of a popular song, and the theater, and one excursion season when they both had been in Lunar City, Luna—apparently at the same time. The fact that there had been seven million other humans in Lunar City along with them did not seem to lessen the intimacy of the coincidence in the slightest.

Later and with childish delight, Sara showed him where she lived. Her apartment was festooned with the bright little ornaments that were so popular at that time in the Eighteen

Planets. Everywhere he looked, Deitrich beheld some little glittering bauble.

There were stories for each, where it came from, how she happened to acquire it. Unmentioned but evident were the carefully nurtured sentimental bonds for each, and with the many little bonds, the growing fabric of emotional citizenship.

Everything had been shown and discussed, and she was smothering her face against his chest when he said, "You know, most TJ pilots carry their women with them, but I never had any."

Immediately he could feel the tenseness creep into her body, and she looked quickly up at him. Her eyes glistened in the semidarkness. "Let's not talk about leaving anywhere again, ever."

He started to speak, but she put her hand on his lips. "Let's pretend, just for a while, that we've lived here all our lives, that we belong here and love it." She kissed him. "Two of us can pretend better than one of us."

The business of disposing of his cargoes was brief and quickly dispatched into the government channels provided for such things. And the problem of loading the precious, clumsy transport cylinders with goods for the M33 systems was easily handled also by the government agencies. Deitrich soon found his time largely free, with little to think about other than the rapidly approaching date of his departure.

He was concerned. He could see the growing excitement and fear in Sara. There was no mention at all of leaving, but the sober chronometer mounted in the visiphone cabinet at her apartment solemnly measured off the pleasant interlude in little, sensible fragments. Somewhat against his better judgment, Deitrich decided to let things take their course.

One evning after she had proudly shown him the electro park at the Planet Center, the rigid defense she had built up crumbled and she wept.

She could not leave, she explained.

She could not again go all through the agony of readjusting herself to a new culture. But now, after him, she could not stay, either. She said that when he left, she would die.

Deitrich had anticipated something of this sort, but suddenly and unexpectedly he was bitter. He muttered harshly, "The only thing you're in love with is the past."

"Why did you come," she sobbed. "It would have been all right if you had not come."

"Don't blame me," he shouted back at her. "It's this play-acting you've been doing."

"You must stay here," she said. "You can't go away and leave me now."

"What am I supposed to do," he demanded angrily. "Leave twelve hundred men and women out there in orbit forever just because at your age you still can't face reality?"

"You can't leave," she sobbed again.

Deitrich stormed out of the apartment. He took a cab to his office, snapped at his secretary, and then fell flat on his face over an unexpected cleaning roach.

He sat up with blood gushing from his nose down his tunic onto the floor. The startled machine limped over to a fresh spot of blood on the carpet, examining it with irregularly twitching antennas.

"Get out of here," howled Deitrich. The robot scuttled obediently if unevenly back to the chute, dust wheezing from a ruptured sac, and disappeared.

Deitrich swore. The blood stopped gushing and became a flow. A doctor who had been summoned by his frightened secretary came in quickly and was amused. But he also made skillful repairs, and the only souvenir left of the accident was a bloodstained tunic.

After the doctor left Deitrich sat at his desk staring at the closed door. Gloomy and remorseful, he contemplated the situation. He felt that somehow he had been cheated again, and knew it was that which had made him angry with Sara. It had been a trap that he had helped to lay himself.

There was a soft buzzing from the intercom. He ignored it. It insisted, and he broke from his reverie. "Yes?"

"The man Tsuroak is here again, sir."

Deitrich frowned, trying to place the name in his memory. The secretary, interpreting the hesitation, said, "He is the father of that boy who shipped illegally to M33."

"Oh, yes," Deitrich said. "Send him in." He quickly changed his tunic, and with an effort cleared his mind of his troubles. This man had troubles of his own.

Tsuroak shuffled in as hesitantly and apologetically as before. He stood embarrassed until Deitrich motioned him to a seat.

"Well," Deitrich asked kindly, "what did you decide to do?"

The man cleared his throat. "Sir, I explained to my wife what you told me, and we—" He hesitated, his miserable eyes seeking the floor. "We decided to stay here," Tsuroak blurted out unhappily.

"I understand," Deitrich replied.

"We thought that our responsibilities to our other children were too—I mean, after all, we would have had to take them with us, of course, and that would be pretty hard on them."

"They didn't want to go, did they?"

Tsuroak shook his head. He looked imploringly at Deitrich. "The boy is twenty-seven. That's pretty young, but it isn't as if he were just a baby." He declared with unconvincing defensiveness, "I could take care of myself pretty well at his age, and he follows me."

"Of course," Deitrich said sympathetically. "I think you are acting very wisely. I've been in this business a long time, and I know what happens."

Tsuroak bobbed his head up and down gratefully. "Thank you," he murmured.

He stood up, but immediately resumed his seat again, staring at the floor with his sad, helpless expression. He mumbled, "But we thought that something should be done to keep this sort of thing from happening again — to other people's boys."

"There are definite regulations," Deitrich replied. "And I can assure you that the penalties are harsh. The investigation takes some time, but when it is completed they probably will have found the man who made the mistake. If he is suspected of doing it willfully, he will be prosecuted in a criminal court. You wouldn't want them to convict an innocent man, would you?"

"Oh, I don't —" Tsuroak sputtered his denial of such a desire.

"Of course you wouldn't. And please be confident that steps are being taken to prevent its ever happening again."

Tsuroak left, still protesting his gratitude.

After a moment, Deitrich drew out the little packet that held the departure schedule, the clearance capsule and the control tapes. He pensively studied the symbols on the outside of the packet and considered.

Impulsively he called his secretary. "See if you can get me Sara McGee on the phone," he ordered. "And then get me a roofcab."

"Sara who?" the secretary wanted to know, and Deitrich was forced to look up her visiphone code.

He spent another minute of gloomy staring at the capsule packet before he heard the secretary reply, "Sorry. There is no answer."

"Then get the roofcab."

He returned immediately to her

apartment but she was gone. Although the visiphone had indicated this, her absence was a relief to Deitrich. He had had a few minutes with an unpleasant picture in his mind.

The chronometer blipped the hour in small, melodious chants. Deitrich went back to the roof again.

There was a hope that was almost an assurance that Sara would be at the port. He felt that it would be consistent with what he knew of her. But when he looked around, he could not see her anywhere. His search was interrupted by Tsuroak just outside the ship that was scheduled to take him out to his fleet.

This time the merchant had had his wife with him. She had been crying, and was making an effort to control her voice. "Would you tell him if you see him up there that . . . that —"

Tsuroak comforted her. Deitrich gloomily nodded, gazing about the field. "Sure," he said. "If I run into him, I'll give him the whole story."

"We appreciate that," Tsuroak said humbly. "Just so he understands."

Gently and gravely, Deitrich shook hands with both of them. He said, "I'm sure he will understand. And he'll be a better man for all your trouble."

He knew as he said it that it was practically certain that he would never see their son. The odds were astronomically against it, without spending a long time searching for him. And Deitrich would not be able to do that.

It was then that he saw her. She was standing near the customs building, shyly looking out from a corner. He beckoned to her and waited, knowing she would come.

"Well?" he asked her. "Are you ready?"

There were no tears here. She returned his gaze levelly, but her voice was doubtful as she echoed, "Ready?"

Deitrich nodded and smiled. "You wouldn't have come if you did not intend to let me talk you into leaving."

There appeared to be something wrong with her voice, so he explained. "If you come with me, you will be just resuming the habits you have had for over half your life, except for the past four years. And what's more, you'll find that the ship is your home —and mine."

Sara looked up at the sky timidly, but she nodded her head. "All right," she said in a low, tired voice.

"So." Deitrich indicated the ship. "Get in."

"But my things —" she protested. "All my things —"

"Get in," Deitrich repeated. "Those things never were yours. You just borrowed them." And he added gently, "I'll give you things you can keep."

THE END

IN TIMES TO COME

Starting with this issue, we've added a symbolic design motif on the cover in the upper left; in case there's someone who hasn't noticed it, there are a few other magazines on the stands that have adopted the same size, shape, and general appearance, plus the same title-designation of "science fiction." This somewhat confuses the issue — in fact any issue. Further, there are indications that any particular design adopted is soon duplicated. So — what to do?

This month we have the atom symbol up there in the corner. Next month, the symbol won't be the same, but will be analogous; it's the geometrical pattern of shock-waves produced by a hypersonic missile, known as "Mach diamonds." The next month it will be . . . something. I don't know yet, but again it will be a system of geometrical lines and curves intimately related to some phase of scientific work.

No two months will the symbol be the same individual; each month a member of the species will be in the upper left-hand corner. Each will be different-but-similar. That may help in un-confusing the issues! THE EDITOR.

THE ANALYTICAL LABORATORY

The report below indicates the standings of the various stories in the November issue; Ray Jones gets the 4¢ bonus rate, and your votes have also given Jim Blish the second-place bonus. But I'd like to comment particularly on the letters concerning "The Happiness Effect." There are some stories that are based on the emotional effect the author can evoke; "Happiness Effect" is one of those. Now in this instance, the author's intent was to evoke a powerful repugnance at the very idea of a system wherein happiness could be created by mechanistic fiat — where they could say "You'll do it and *like* it!" and make that stick.

Result: The better job the author does, the more thoroughly he repels the reader! Wonder how such a story should be considered in An Lab ratings, then?

Anyhow, here's the score board:

Place	*Story*	*Author*	*Points*
1.	TRADE SECRET	Raymond F. Jones	1.43
2.	EARTHMAN COME HOME	James Blish	2.76
3.	POTENTIAL	Robert Sheckley	2.86
4.	THE HAPPINESS EFFECT	Raymond E. Banks	3.32
5.	THE SHARPIES	John Murphy	4.53

THE EDITOR.

ROYAL ROAD

BY A. ARTHUR SMITH

There are some things that simply can't be stolen. You can't, for instance, steal the satisfaction of creating a fine thing; you can steal only the thing. And if it's an Idea—or a mind . . .

Illustrated by Kelly Freas

Success and failure are the same;
One thing beneath a double name.

That piece of Arkadian doggerel-philosophy had never much impressed Duke Harald; not, that is, until he came to Terra as a student.

The situation was itself a paradox of sorts. There was his very presence on the mother world; he, Lord of the Outer Marches, premier duke of Arkady, a scarred and dark-faced soldier among a crowd of boys. And then, he had allowed himself but two months to achieve what others won with hardship in a full two years.

Two months on Terra—and scant progress yet!

"There must be a faster way," he said aloud, running heavy fingers through close-cropped hair.

The slim and elegant Terran who was his sole companion in the study cell looked up and threw a brief smile across the low partition of the double lectern. For a moment, Duke Harald ignored the unspoken question; then:

"You know why I'm here on Terra, young Melton?"

"To learn telepathy—why else?"

"I don't mean that. I mean, what use is this telepathy to me, that I should come a thousand parsecs just to gain the knack of it?"

"Why . . . well, you're a soldier, I'm told, and I suppose that esper skills must have some place in warfare—" The Terran's voice trailed off in silence. For generations war had been unknown on Terra, and the mental frame of reference that was needed had all but faded from the planet's culture.

"On the contrary." Indeed, Duke Harald thought with sudden insight, the broad intimacy of telepathic contact might prove unhandy to a soldier. Efficiency demanded an abstract, an impersonal attitude towards the enemy of the moment. Was that, perhaps, why Terra didn't make war too readily these days?

"Of course," the Arkadian went on, "for military intelligence—finding out what the other side's planning to do, so you can do it sooner and better—it might be useful. But even so, wars have been won before, and will be won again, without the esper skill."

"What then?" asked Melton. "If the skill is of no use—"

"No use," said Duke Harald, "only if we of Arkady were faced with the usual war against the usual human enemy. But we're not. We're up against that galactic rarity, an alien species that's as ready and willing to fight, almost, as any of human stock."

"Terrans don't fight." Melton's tone held a shade of self-satisfied condescension.

"No. I suppose not. But out there"—Duke Harald made a sweeping ges-

ture that took in the far reaches of the universe—"we haven't the time or the leisure to grow soft! Particularly on the newer worlds, like Arkady. On and off, we've had to trade blasters and bombs with aliens ever since my grandfather brought the first starship in from Old Altair."

Looking down at the papers on his desk, the Terran murmured dryly, "That would be, I presume, at the time of the revolution on Altair?"

"Aye," said Duke Harald, curtly. And paused to regain composure. Even after two generations, any mention of the fall of the old dynasty of Altair could prick the touchy pride of an Arkadian nobleman. But he had learned that it was futile to argue the point with a Terran. Their histories taught such a queerly twisted version of the Great Exile.

"Well! Right now there's a truce—of sorts. Great Khrom alone knows how long it will last! But to get to the bones and marrow of the problem: our nonhuman opponents are also natural telepaths. Pure telepaths," the Arkadian repeated, stressing the adjective pointedly.

"Pure telepaths?" Melton was interested, puzzled, and faintly skeptical. "You can't mean—no language, no sensory communication at all?"

"I mean just that," said Duke Harald flatly. "You see the problem? It's not a question of screening off a few special operators. Any man of theirs—if you want to call them men!—is a potential spy, once he's within esper range. And we can't learn their plans, at least not soon enough or in sufficient detail. Why," his voice grew harsh, "we don't even bother to take prisoners any more! What use, when that prisoner can't be questioned; when he just squats there, dumb and insolent, picks your brains, and relays the information back to his home base?"

"And so, they have an edge?"

"A slight one," Duke Harald admitted. "Just enough to match our superiority in technical skill, and in sheer fighting ability. Otherwise they wouldn't have lasted six months—old Homo sapiens is still the fightingest animal of them all!"

And then Duke Harald grinned suddenly, at the look of shocked surprise that crossed the Terran's face.

"Yes," he said, still smiling, "I know that's almost an indecent remark, here on Terra. But it's still a fact of nature out among the stars. How else do you suppose people from old Terra managed to grab off so many of the choicest worlds of the galaxy? By sweet reasonableness?"

"But surely," asked Melton, fascinated despite himself, "if you have no telepaths of your own, you could have had the services of an esper adept from Terra? Would that not have been faster than this lengthy training?"

"Faster, sure." And almost certainly fatal to his own plans, and per-

haps even to the whole present culture of Arkady. For he had not forgotten—if the other had—the rumor that a Terran adept had been in part responsible for the fall of the old kings of Altair. And Arkady, its throne long vacant, ruled by a divided and quarrelsome Council of Peers, was ripe at last to herald a new dynasty. No, this was decidedly not the time to let Terran ideas of "democracy" loose among the commoners.

"Yes, it would be faster," Duke Harald said again, choosing his words with care. He could not, he reminded himself, afford to become embroiled in political arguments. "But we of Arkady have always tried to make our own way in the universe. And," he paused briefly, "would any Terran, adept though he might be, either enjoy or be particularly good at military problems?"

Melton said nothing; made only a silent gesture of distaste.

"And so," Duke Harald finished, "here am I, a somewhat reluctant student at your Esper Institute, while the aliens are up to Khrom knows what! Again I say, I wish there were something faster. Surely your scientists ought to have come up with something new by now! Some wonder drug or other?"

That last was a fishing expedition; a search for confirmation, however slight, of the rumor that had first reached him on distant Arkady. Would Melton rise to the bait?

"Well," said the Terran slowly, poker-faced, "so far there's only TPH."

"TPH? What's that?"

"Telepathic hormone. But," Melton's smile seemed as much for himself as for the Arkadian's ill-concealed glare of interest, "unfortunately it's just a myth. No, wait," as Duke Harald began to voice protest, "I apologize for taking advantage of you; I realize only too well how you must feel. But did you think you were the only one who was ever impatient to acquire esper skill? You should have been born a Terran, then; brought up in the conviction that knowledge of the mind is the highest human knowledge. And yet, we Terrans have our share of laziness. Hence the common dream—so common that we've even given it a name!—the fantasied wish-fulfillment of a magic potion that will shortcircuit all this work and study. I'm afraid," his tones were apologetic, "that our early training is not perhaps so reality-centered as we sometimes like to think."

So the pattern *had* repeated itself; the same tale told, with the same disclaimer of its truth! But Melton was speaking again.

"To be blunt," he was saying with an air of finality, "there really does not seem to be any easy way—any royal road to telepathy."

Nevertheless Duke Harald's sense of urgency remained. There was still the problem of the aliens. And, a part

of that problem, and yet peculiarly distinct, was his own private plan, now working so slowly towards fruition. As premier duke of Arkady, he had been able to persuade the Council to send him on this quest. But he was not naive enough to think that grudging consent meant an end to opposition. For he had rivals in the Council —Duke Charles, for one. And if those rivals came to realize how near completion were his plans—attainment of the esper skill was all that he now needed—then the noble weathervanes would change their minds, vote for his recall, and bring in a Terran adept. The more fools they, to risk another Altair!

The feeling of impatience was still with him as the hour drew on for another grueling session with his robot therapist. Of all the training at the Institute, these daily sessions seemed least relevant. And yet the adept-masters were without exception firm in their insistence on this aspect of the lengthy course. With slow reluctance Duke Harald made his way to the Hall of Therapy, and to the quiet windowless room where the robot waited.

The machine that faced him as he sank into the relaxing embrace of the special chair was, he knew, but an extension of the great computer banks buried bedrock deep in vaults beneath the Central Library. Yet he tended to endow it with an austere personality of its own.

Pressing his hands lightly to the glowing sensiplate that registered his personal pattern, he relaxed deeply and allowed the silent mechanisms to carry out their wonted ministrations. Deft mechanical hands swabbed his skin with pungent ether, massaged it with astringent conducting jellies, strapped on, taped on and otherwise affixed the spongy plastoid cubes that detected the electric potentials from the muscles underneath. A cunningly shaped helmet settled down about his ears, to hold against his skull the multiple probes of an electroencephalograph. A flat and hollow band coiled snakelike about one arm and was inflated; a pressure gauge nestled snugly against his diaphragm—recorders of blood pressure and breathing.

At early sessions these fittings had bothered the Arkadian; had kept him tense with vague discomfort. But apprehension had passed away with use. He now "wore" his instruments easily, like a suit of clothes.

As ever, the session started with semantic training. Similar but non-identical pairs of images appeared and flowed across the robot's "face," while a clear and smoothly modulated voice repeated, over and over, the ancient formula: "This is not this, this is not—"

More and more alike became the pictures; faster and faster they moved; until at length they blended in a vaguely shimmering band of light. The

band steadied, brightened, and narrowed abruptly into the restlessly weaving pattern of the hypnagogic light. Duke Harald concentrated—he could not have done otherwise—as the pattern surged in complex synchrony with the slow rhythm of his breathing and the staccato beat of his heart. And as he concentrated, memory pictures came, to fuse with and displace the changing tapestry of light. To sharpen, as his eyelids flickered shut, into the full brilliance of the eidetic recall.

He was jouncing along a shadowed forest road in Arkady. The wheel of a scout car shook between his hands; the springs groaned audibly; and, in the right-hand bucket-seat his sergeant-squire—who should by rights have driven—groaned beneath his breath. For Duke Harald, impatient of the slowness of ground transport, was noted as a demon-driver, and the ride was rough! Yet rough and slow as it was, anachronistic as it seemed, on a forest planet surface travel had its role and had been cultivated. For alien eyes watched out of space; alien raiders swooped hawklike from the lofty skies; and the mazelike forest paths gave secrecy.

But it was slow. Duke Harald pushed the car a trifle harder. His squire almost—not quite, but almost! —muttered protest. And then ducked involuntarily, as a red-winged pheasant flushed noisily from the roadside brush and rocketed low above them, the whir of its wings and its raucous cry quite clear above the hum of the electric motors.

Ahead the trees were starting to thin out, yielding place to narrow open fields cross-hatched with vineyards. The road sloped gently down to a broad and curving river, where a colorful huddle of little dwellings lay cupped in the bend between trees and water.

They broke from the forest. Both men, from long habit, raised their eyes to the thin cloud cover that the early sun had not yet burned away. Lifted their eyes—and on the instant became desperately busy!

Duke Harald crashed his right foot to the floor. The motor hum became an angry snarl; the cleated tires scrabbled at the dusty surface of the road. The car lurched forward into speed.

The sergeant-squire forgot his worries. One finger stabbed at a button on the dash, and an automatic sender began to shout its "Red Alert" along a microbeam. A gyro-mounted blaster rose smoothly from his housing. And the squire, bracing himself against the hard sway of the car, collapsed the half-screen in front of him and started to hurl bolt upon bolt of blue-white flame into the misty sky above the village.

Three slim, black, delta-winged spacecraft whirled there in a tight circle. A fourth, slipping and fish-tailing, rode its flaming under-jets down

to the village green. Smoke trails of tracer and of guided missiles wove a lacy net of death across the sky; eyes accustomed to the cool morning light of the dim forest trails were dazzled by the sudden hot brilliance of energy beams; ears which had heard nothing louder than a bird's startled cry were assaulted by a shrieking, chattering din. And already, on the outskirts of the village, a gayly painted house had crumpled into crazy shards.

"Raiders!" groaned Duke Harald. "And the local baron is away! They'll have only hand weapons in the village."

Not that those were to be despised. Weight for weight they were more potent than anything the aliens had to offer, depending as they did on bombs and rockets and other packaged high explosive. But still, hand blasters against spacecraft!

"One away!" yelled the squire suddenly, without looking up from his compensating gunsight. The beams of the handguns, reinforced now by heavier fire from the scout car's weapon, had met in fortuitous but deadly focus. And at that point of meeting there blossomed an expanding ball of flame—above it a black shape, driving a hasty and erratic course for outer space.

"He'll not be back!" said Duke Harald, blasting the scout car down the last slope and into the final turn in a screaming power skid.

And then, ahead—too near by several score of feet—a free-ball bomb sheered the corner from the closest red-roofed house, skipped to the road before its fuse let go, and exploded in a cloud of flame and dust and flying debris. The sergeant-squire screamed once, wordlessly. Moving with deceptive slowness, a jagged rocky missile crushed his gun and made a bloody ruin of his face. He sagged limply in his safety harness. Duke Harald cursed, pumped his brakes and fought to keep his vehicle under control. Too late! Lurching, whipsawing, the car plunged broadside into the swirling cloud of dust. It bounced once, and then a second time on broken paving stone—and flipped over on its back.

(At this point, Duke Harald almost backed away from the memory. And the eidetic images began to fade. Sternly he fought them back again.)

Long minutes later, he remembered, he had dragged himself from beneath the shattered car. Dragged out his squire's body too, useless gesture though that act was. The crater which had wrecked them had also, oddly, spared his life. For the scout car had alighted squarely within it, bridging the narrow bottom of the cone. And into that small space he dropped, when shaking fingers and dazed intelligence at last found strength and wit to release his safety belt.

Then, leaning against crumpled metal, breathing shallowly as knife-edge pain stabbed through his chest, Duke Harald squinted along the bar-

rel of his handgun and poured useless flame and futile hatred after the black ships, departing now as swiftly as they had come.

Three grimy, smoke-stained commoners found him there. They were wrestling a red handcart laden with chemical extinguishers to the site of the nearest blaze. Suddenly deferential at seeing the blood-smeared silver-gray of his tunic and the shining crested helmet, one of them left his comrades and led Duke Harald to the community first-aid post. There, a sullen but outwardly polite medico taped up his ribs—unnecessarily tight, Duke Harald thought. And that attitude pointed up another facet of the situation that his fellows of the Council preferred to ignore: the restlessness, the growing discontent among the commoners. A military aristocracy's chief—and only—claim to leadership stemmed from the protection that its battle skills afforded. If that protection failed, what then? Another Altair?

Duke Harald stood up, resumed his wrinkled shirt and tunic, and touched a lighter to a cigarette. The white-garbed medico was cleaning up. There were no more patients; Duke Harald had waived treatment until the last of the villagers' wounds had been attended.

At length he spoke, impatient of the other's fussy, back-turned puttering with his instruments.

"What prisoners?" he asked. It did not occur to him—nor would it have to any other Arkadian—to doubt that the raiders had made off with some.

"Two, your grace." The medico's voice shook. "Old Jonas Borrow and his small grandson, sunning themselves on the bench before the Red Lion."

Duke Harald grunted, outwardly impassive. He had heard these tales, seen these sights too often before. His hatred for the aliens was as marrow-deep as the other's. Only it was colder—save perhaps in the immediate red flame of battle.

"This Jonas Borrow—who was he?" The local baron was, he knew, in King's Town. The old man then, was probably—

"Our village clan leader," said the other, confirming the thought. Always, always the telepathic aliens took people who were in a position to know something. How much had Jonas Borrow known of the projected troop levies? Well, that plan, too, would now have to be changed.

"Has he a successor, hereditary or appointed?" he went on.

"Not on Arkady, your grace. His son—the child's father—is off-planet somewhere."

"Very well." Duke Harald decided swiftly. As ruler of the Outer Marches, his was the final authority in these forest villages. "You are clan leader, as of now. Your baron will confirm when he gets back." The medico, he could see, was torn between an idea of

declining, and the glamour of the proffered post. Duke Harald gave him no time to hesitate.

"Now, summon your clan. And find me a recordograph. Mine lies shattered in the wreck of my car, and I need the observations of the people before time and idle chatter can distort them."

A poor substitute this, interrogating one's own people instead of enemy prisoners. But such observations, and the subsequent logical analysis, paid dividends in knowledge of the battle tactics of the enemy.

He had learned nothing new that time, he remembered; just confirmation of previous reports. But—this had been the time when his idea of seeking telepathic skill on Terra had hardened into decision. The reports from Godfrey's agents had come later, and—

He blanked the thought. He dared not give the sensitive robot even a hint of that plan. Not when it involved what must be the galaxy's best-kept secret!

All this passed through his consciousness as a single flash of thought, and was as swiftly replaced by innocuous surface images. Not swiftly enough, though. Something—perhaps he had caught his breath, perhaps a momentary tensing of a muscle—had caused a deviant flicker on a recording needle, had sent an impulse to a comparator circuit somewhere in the depths of the great computer bank.

"The sequence is unfinished," said the robot, in smooth, unhuman tones.

"Possibly not," Duke Harald admitted, bringing latent feelings of hunger to the fore—and the hour *was* getting late! "Yet it faded out."

"Run it again," said the robot, and backed the suggestion with the hypnagogic pattern. And the sequence was repeated; once and then again, and again until a dozen repetitions had been counted, and both the memory and Duke Harald were exhausted. Then and then only did the machine accept the hunger explanation, and dismiss him.

Dinner at the Arkadian embassy that night.

Duke Harald dressed carefully but informally in the small three-room bachelor apartment he had taken near the Institute, and, scorning mechanical transport, set out on foot. A soldier, somehow, had to keep in training—and he had little use for the gracefully formalized and balletlike patterns that were Terran calisthenics!

His three-mile march took him down broad, tree-shadowed University Avenue to where it intersected at an angle the glitter of the fabled Martian Way. Despite himself, he paused there; fascinated anew by the brilliant, glowing spectacle of the most famous street in all the galaxy. And as he stared—like any provincial!—a stranger stepped from the colorful throng and stood before him. An outspacer apparently, by his garb; and

apparently lost, by the bewildered way in which he extended a tiny map case. Duke Harald saw—and to outward seeming ignored—the recognition signal which the other flashed to him in the Arkadian hand-language.

"Your pardon, sir," said the stranger with a flustered smile, "but my feet seem to have been leading me in circles. I look for Kinseth Boulevard. Could you direct me?"

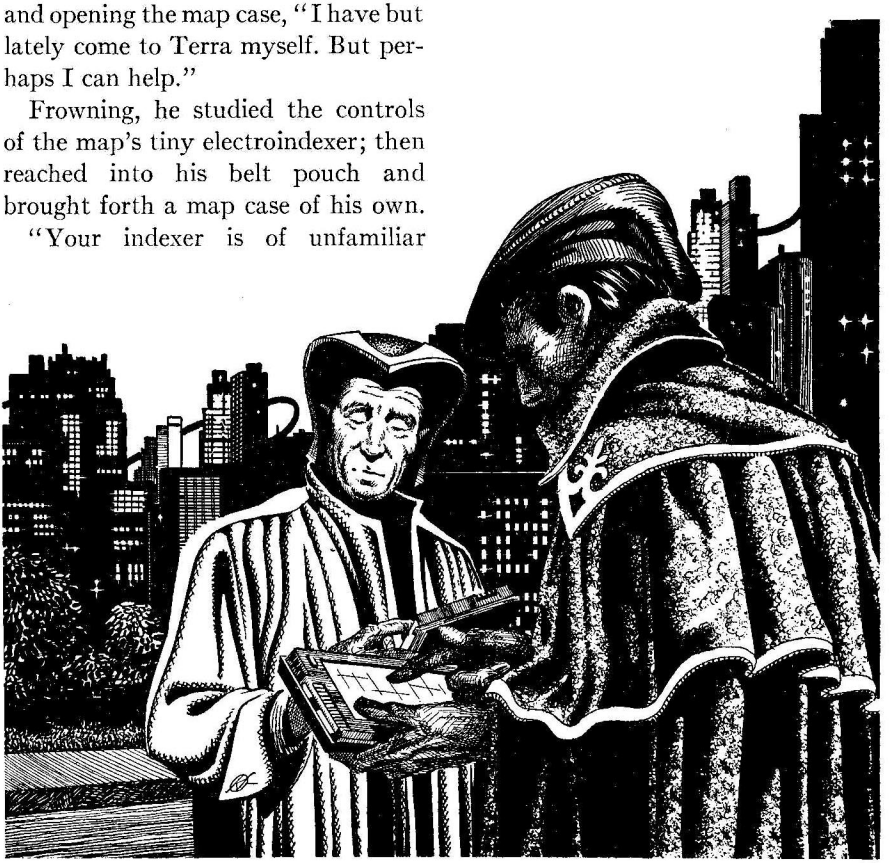
"Well," said Duke Harald, taking and opening the map case, "I have but lately come to Terra myself. But perhaps I can help."

Frowning, he studied the controls of the map's tiny electroindexer; then reached into his belt pouch and brought forth a map case of his own.

"Your indexer is of unfamiliar make," he grunted, comparing the two intently. "Ah yes, here we have it."

He returned his own case to his pouch, set the pointers of the stranger's map upon the named location, and handed it back.

"Ten thousand thanks!" exclaimed the outspacer, to which Duke Harald only inclined his head slightly in acknowledgement. They parted. Duke



Harald, the perfect picture of the haughty nobleman, marched off in brisk, uncompromising silence; while the stranger, half-embarrassed, called effusive gratitude after him. Nevertheless, within Duke Harald's pouch there now rested a tiny plastic spool, wound with turn upon silvery turn of hair-fine wire!

The meal was good but informal. Apart from Duke Harald and old Count Godfrey, the ambassador, only two others were present: Terrans both, minor co-ordinators in the loosely organized government of Terra.

"Window dressing," Count Godfrey called them afterwards, when the two Arkadians were alone. Studying the amber fluid that swirled in the bottom of a balloon-shaped glass, his wrinkled face broke into a sly but gentle smile. "When you're planning something the other side won't like, do it under their noses if it's possible."

Duke Harald grinned. He and Count Godfrey were, despite the difference in age and rank, old friends. The count had been his military tutor, when he was young in knighthood; now, he was Duke Harald's chief supporter, confidant, and almost elder brother.

"Well," said Count Godfrey, "out with it. What progress, after another month among the bright lights and brighter brains of Terra?"

"Little that is definite—much indefinite, unproven," was the sober answer. "However . . . well, at risk of boring you with what you already know, I'm going to think out loud for a bit. This constant feeling of having to be on guard against telepathy," Duke Harald added wryly, "is more than a trifle wearying. Or do I need to tell you that?"

"No," said the other, sipping his brandy. "Think away."

"Right. First, then, the aliens. We are agreed that to settle that problem Arkady needs both telepathy and a unified royal government. The present Council of Peers is too unwieldy and too divided to function effectively in any all-out war."

"Agreed."

"However, the only candidate for the crown who would have a chance of gaining solid majority support in the Council—thus avoiding civil war—must be able to convince the other peers that he can do what they cannot. The esper skill could supply that conviction.

"And, finally, Terra is the only human world where such skills can be learned. Unfortunately, the minimum training period is two years. And, Council politics being what they are, our so-far hypothetical aspirant to the throne would be bold indeed to absent himself from Arkady for more than two or three months, at most."

"Yet you are here."

"Aye, I am here. Because of a rumor, a report—furnished initially by you—that the long training course

demanded by the Terran adepts is unnecessary. That it is a screen, designed to cover Terra's secret monopoly of certain drugs, hormones or what-have-you, which are the real and only road to esper power."

Duke Harald paused and leaned forward in his chair.

"So," he went on, "I decided I could gamble a few months absence from Arkady, to check that story in the only place where it can be checked. Inside the Esper Institute itself."

"And?"

"And I have found certain curious, but on the surface negative evidence. For example; only today one of the senior Terran students, who is due to stand his vigil shortly, joked with me about something he called TPH. And then proceeded to explain it away as a sort of planetary myth, which no one should take seriously. That," said Duke Harald, "is a tale which I have run into at least twice before, in almost the same terms."

"Still—" Count Godfrey sounded doubtful.

"Oh, it's slim enough, I admit. However—" Duke Harald's voice trailed off. He rose to his feet and crossed to the long polished table where he had placed his military cross-belt. From the pouch he extracted the small wire-wound spool.

"Have you a playback that will handle this?"

"In the desk yonder." The old ambassador nodded to the corner of the room. "Second drawer on the right—it's built in."

"Good." Duke Harald strode over and began to insert the spool. "This," he said, fingers busy threading wire between magnets, "may hold the answer—I hope. There, that does it."

He straightened. Finger on the starting button, he paused and glanced around the quiet, spacious room.

"Three days ago," he said, "I at last managed to conceal the transmitting unit of a Sonotec in the inner office of my course tutor, Master Elwyn. I delayed this long, I might add, mainly because I had to test unobtrusively the truth of something I heard when I enrolled. That the esper Prime Rule—the Rule of Privacy—extends to students as well as to outsiders; that no one's thoughts will be invaded by an adept, save by prior voluntary consent.

"Well, then, I planted the Sonotec. The receiver and recorder I had given already to one of your best agents—who, by the way, must be rewarded—so that if, by chance, the microbeam should be detected, it would not point to one of us directly. And tonight, your agent passed me this—a three-day record of Master Elwyn's most secret conferences."

"Does he—the agent, that is—know what's on that wire?"

"Well, hardly." Duke Harald looked quizzically at his old friend. "D'you think I'm that new at the game? No,

the stuff went out—and was recorded—scrambled. My own code, too. I've set it up on your unit, so we'll hear it in clear. That is," he added with a grin, "if you feel up to it. It may well be an all-night job, even running it at fast scan."

"Humph!" The old count, who had been leaning back with half-shut eyes, snorted and sat bolt upright. "It won't be the first time I've missed a night's sleep. Nor, I hope, the last." He poured fresh brandy, turned on a waiting coffee maker and, thus prepared, settled back and closed his eyes once more. "Turn on your Master Elwyn; let's hear what he has to say."

It was a difficult wire to listen to; and most oddly garbled at times. In addition to the distortion inevitable to the use of pick-up elements measurable in millimeters, and the further loss of information imposed by the scrambling circuits, there were periods of peculiar fade-out, when the recorded voices dropped away to mere whispers despite all that the automatic volume control could do, and the talkers sounded as though their voices were filled with thin mush.

"An added precaution against them tracing the beam, if they do detect it," said Duke Harald softly in explanation. "The receiver and recorder are portable; built into a brief case. Its location is shifted at least once an hour, following a random pattern."

Time wore on. Time during which the coffee cups were emptied and refilled and emptied again; time during which only the sharp rustling of papers, or Master Elwyn's voice discussing matters of pure and unimportant routine, reached the ears of the intently listening Arkadians. Duke Harald began to frown. And then, just as the little spool was beginning to show traces of empty core, it came.

". . . Should know, as a senior, that the esper drug is not a subject for idle jests," Master Elwyn's voice came through with sudden clarity. "Not, certainly, where an outspacer is concerned."

"Your pardon, master," said a voice that Duke Harald recognized as belonging to his Terran acquaintance, Melton. "But I assumed . . . I believed, rather, just what I told our Arkadian friend. That TPH was nothing but a story."

"In a sense, you were right. In another sense, however, the drug is . . . but hold! That would seem to be my call."

The Arkadians could hear in the background a soft musical ringing; followed by a lengthy spell of silence.

"What's wrong?" Count Godfrey asked in a whisper. "Did your transmitter go out? Now, of all times?"

"No—the carrier's still on. Hear it?" There was a faint hissing sound coming from the machine, punctuated at that moment by a startling *twang*. "And that," said Duke Harald, with a wry smile for his own momentary

startle, "is Melton, getting restless. The only place I could hide the Sonotec was behind a leg of the visitor's chair. And it sounds as though the springs creak!

"By the galaxy, I don't know . . . yes, I do! Master Elwyn's *en rapport* with another adept. They don't use voice between themselves, you know."

"Now, Melton," the adept's voice came in again, slowly and deliberately, "as I was saying, in a sense you are right. However, and in view of the fact that your initiation into the Esper Guild is almost upon you — your vigil is set for tomorrow night—there are some things that you now should know. To which end, I would suggest that you study these—"

An abrupt and thunderous crashing from the speaker, and all sound went out; even to the thin hiss of the carrier. The two noble conspirators stared at each other with a wild surprise. And Duke Harald reached out to cut the playback. Suddenly the speaker burst into a senseless gabble.

"What? Oh, sure," said Duke Harald, and he deftly changed the scramble setting.

"Your grace," a voice was saying, in purest Arkadian accents, "the Sonotec transmission went out at 0435 hours. From the nature of the readings at the time of the break, destruction of the sender is most likely. I shall try to pass this spool to you at the assigned time and place. I am now abandoning this location."

"Good lad!" Duke Harald commented. "I guess they didn't trace him."

"You think, then, that your Sonotec was discovered?"

"And smashed. Well, I guess it served its purpose. I don't suppose trying to plant another would be wise?"

"Most unwise." Count Godfrey was emphatic.

"You're probably right," Duke Harald conceded. "But I would have liked to hear some more. However, we have something. Let's pool our wits and see just what that something is."

Brief discussion found them in agreement on two points. That the rumor of a telepathic drug seemed now to have some sure foundation. And that Duke Harald would have to contrive to be present at the often mentioned but still mysterious "vigil."

"But how?" Count Godfrey wondered.

"Oh, I've got a few things in my lock-box that may help."

"Such as?"

"Oh, gadgets." Duke Harald was deliberately vague. Then, as the old ambassador half-opened his mouth in protest, "No, I don't know yet just what I'll use, or how I'll work it. And even if I did, you know my thoughts: share a plan in detail, and you're psychologically committed to trying to make it work in just that way, even when the situation changes." He

yawned, and set the silvery wire to spinning through the erasing coils. Instinctively he wished to be rid of that piece of tangible evidence.

The nightly "one o'clock rain" was still misting gently down over the streets and towers of the city, when Duke Harald emerged from the embassy. The Terran weather machines, he thought, were marvels of efficiency. But their unvarying regularity made the climate seem a little dull to anyone born and bred on a more primitive, storm-tossed world. A closed three-wheeler bore the Arkadian nobleman home through streets temporarily deserted for the hour-long duration of the rain.

Morning brought a disturbing reminder of Arkadian politics, in the shape of a coded spacegram from the Council of Peers.

"Recall!" said Duke Harald blankly, staring at the yellow message slip. Now, of all times! He translated the order again, and this time noted the signature: Duke Charles, President-Elect. Enlightenment came. Obviously he had stayed away too long. There had been one of those swift realignments of power to which the Council was all too prone. And it had for the moment left control in the hands of his arch-rival.

"And the next step, I suppose, will be to call on Terra for an adept! Well, back I go—but not before I get what I came after."

Even as he said this, Duke Harald crossed the simply furnished sitting room of his apartment to the alcove where his visiphone was placed. He started to set up a calling-pattern; and just as swiftly canceled it.

"Tapped!" said Duke Harald, watching a tiny spot of amber light fade slowly from the screen. The secret, unofficial changes he had made within the instrument had detected interference from a tapping circuit. Someone was set to monitor his calls; And he could make a reasonably accurate guess as to who and why. This, and the finding of his Sonotec in Master Elwyn's office—the two events trod much too closely on each other's heels to be called sheer coincidence.

But were the Terran adepts just suspicious, or—something more?

"There's one way to find out," he muttered, and donned his newest scarlet tunic. No dull student garb today!

His hand was on the door switch, when a soft chiming stopped the movement of his fingers. Flicking on the scanner, he looked at the call-plate; to see, in the outside corridor a Terran in part-uniform.

"Yes?" he queried softly.

"Duke Harald of Arkady?" the other asked in turn.

"Here," said the Arkadian, half regretting that he wore no weapon. If this man were of the police—but no! Events could not have marched that fast. "What is it?"

"Your pardon, Duke Harald. I am Cam Hardy. A public runner, in the service of the Esper Institute. My number," he touched his cap badge, "is 4063. I have an urgent message for you from the adept, Master Elwyn."

"Oh," said Duke Harald flatly. "Right—come in." And the door slid back into its recess as he released the force lock. He took the folded slip of heavy paper, read it with expressionless features.

"No answer," he said then, signing the message book. Then waited while the runner disappeared along the corridor.

Did this change anything, he wondered; this sudden summons to a meeting he had decided to request? To beard the lion in his den was one thing. But if the lion asked you in, what then?

There was one precaution he could take. Closing the door again, he folded Master Elwyn's message into the smallest possible compass, and sealed it—together with the coded spacegram—into a tamper-proof capsule which he marked with the address of the Arkadian embassy. That would be sufficient information for Count Godfrey's alert old brain, he thought, as he dropped the metal egg into the automatic pneumo-tube. Slower, but surer and more private than the phones, the controls of the tube system could hardly have been altered over night.

And now—Master Elwyn!

"Please be seated, your grace," said the adept, when Duke Harald had presented himself. Master Elwyn was, the Arkadian had noticed, always studiously careful about the use of titles and terms of courtesy.

"Thank you, Master Elwyn." Duke Harald was as courteous in his turn; although he could not altogether bring himself to do as Terrans did, and address the other simply as "Master."

"You have faced me with a problem of some delicacy," the white-haired adept remarked without preamble. His intelligent old eyes glowed solemnly at Duke Harald. From apparently nowhere he produced—and with something of the air of a conjuror—a battered little plastic cube. Less than half an inch it measured on its sole unbroken side. It looked as though a grinding heel had crushed it under foot.

"I have? And how, may I ask?" Duke Harald spoke calmly, striving to keep mind and voice and features under such control that even the control itself would not be noticed.

"You do not recognize this, then?"

"Only as a Sonotec unit. Why?"

"I see," said Master Elwyn, slowly. And inwardly, Duke Harald tensed. He knew that, by the Rule of Privacy, the adept could not read his mind without consent. But still—that Sonotec was his, despite his bland denial; and the Terran obviously guessed as much. Were there, he wondered, any limitations to the Rule? In short, were

his thoughts being scanned?

Apparently not.

"Let us," Master Elwyn was saying quietly, "consider this small device." He touched the broken Sonotec negligently with one finger. "Its presence in this office was detected only yesterday. The implications of that fact are —serious."

"Serious? In what way?" Duke Harald asked. Then, allowing a measure of indignation to warm his tones, "And what connection do you fancy that I have with this?"

"The Sonotec beam was traced. To a certain hotel in this city. Before investigators could arrive, however, two men left hurriedly and have not since been found."

"Well?"

"One of those men, it turns out, may have come from Arkady."

"I see." Duke Harald let his voice go heavy with sarcasm. "You suspect me, then, of engineering this curious, this pointless business? But why? I am at a loss to know what mysteries are hidden here—here, in a center of learning—that the tenuous connection of a broken spy instrument and a vanished and half-mythical Arkadian should lead to such a fanciful conclusion!"

"Your grace," said Master Elwyn with a reminiscent smile, "in my youth I studied the history of the semantic dark ages of Terra. Your little speech recalls those studies to my mind."

"Very well," said Duke Harald. "I have already denied knowledge of this Sonotec. But you, it seems, suspect me in some fashion. Will you, then, enlarge upon your suspicions? I," pointedly, "am not a telepath."

"Nor, in this connection," Master Elwyn said with some asperity, "need I be. If, that is, you are implying that I might have broken the Prime Rule. Let me, then, remind you that there is, at least on Terra, such a thing as a rigorous psychologic science. My suspicion, as you call it, is not based on guesswork—nor on illegal use of esper skills—but on psychomathematical analysis.

"But," as Duke Harald moved in his chair as though to protest, "let that pass. Without intending any derogation, I'll not puzzle you with details—save that the P-matrix now includes such matters as the present situation in the galaxy, the interacting roles of Arkady and Terra, and the part that you can play. I note that you are cognizant of some of this. You would not otherwise be wearing uniform." And the old adept pointed to Duke Harald's court tunic.

With an effort the Arkadian kept his face expressionless; he did not trust himself to speak. How, he wondered, could he have thus forgotten that the Terrans were the galaxy's first masters of psychology? But he had forgotten—and black failure loomed before him like the fall of night. Unless . . . but Master Elwyn was speaking still.

"This Sonotec—and the vanishing man from Arkady—were but the latest factors to be added to the matrix. It is not complete as yet; more data are required; still, a partial solution could be found."

"And that concerns me—how?" Duke Harald's face was rigidly impassive. Knowing the old man's passion for meticulous detail, he wondered tensely just how "partial" the solution would turn out to be. Probably a fully outlined plan of action, to any other eyes.

Master Elwyn's bright old eyes seemed to film over briefly; for a moment his gaze focused on the empty air beyond Duke Harald's shoulder. Then:

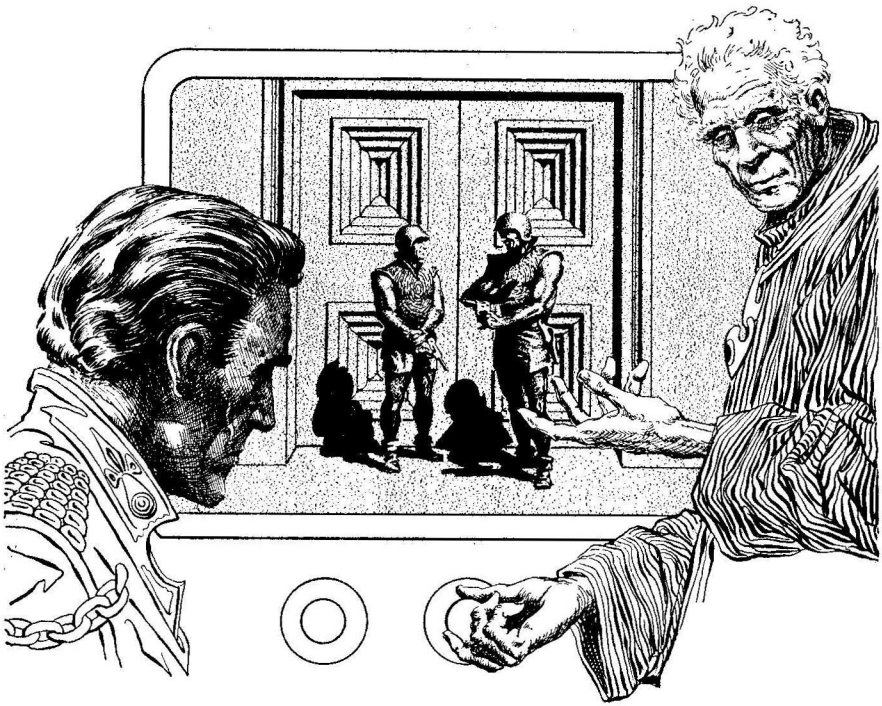
"How does it concern you? Why, in this way—at least for the immediate present. You are invited—urged—to enjoy the hospitality of the Institute. To that end, a suite of rooms has been prepared for you in Alpha Residence. Your personal belongings are on their way there now."

"And if I don't choose to accept your invitation?" Outwardly relaxed, Duke Harald was alert and poised for action. The adept pressed a button on his desk and pointed to the wall. Duke Harald turned and looked. A large vision screen was lighting up, to show a narrow stretch of corridor beyond the office door. A strip of gray-green wall was visible, and a part of the carved bronze doors of the elevator. And against that wall, and before those doors, stood a pair of husky Terrans fingering needle-guns. A little self-consciously, perhaps, as though unused to such an occupation. But, for all that, with an air of full efficiency.

"I see," said Duke Harald flatly. And he did see. Perhaps not every detail; but the major elements of the adept's plan were now becoming clear. A form of house arrest was part of it. That, to give time for further observation of his actions, for skillful, unobtrusive questioning. Despite the adept's confident demeanor, this implied uncertainty. And a desire to temporize: to weigh the consequence of sterner acts against a duke of Arkady. They did not know that he had been recalled, and that his influence with the council was at its lowest ebb.

Once more he blessed the famous Rule of Privacy. He had wondered how to gain admission to the Institute this night, to witness Melton's scheduled vigil. And Master Elwyn, all unwittingly, had furnished half the answer! Now, if they but brought his lock-box over. It was ray-proof; it looked innocuous enough; and he had left a blaster openly in his bedroom.

"I am sorry," said Master Elwyn, and his voice did seem to suggest an honest regret, "that we have had to take this course. There are reasons for it that you do not yet suspect. Nor may I give you fuller explanation at the moment. In the meantime I must



ask that you remain within the confines of the Institute. And messages outside are barred. Apart from this, your status has not altered. Your attendance at your usual classes may continue."

Duke Harald only smiled a little thinly.

"The two gentlemen outside," said Master Elwyn, "will show you to your quarters."

A long twilight was deepening slowly into night when Duke Harald noticed first that his "arrest" was scheduled to become more stringent.

It had not been too irksome through the daylight hours. His escort had departed after taking him to his quarters. And he had full freedom of the grounds and buildings of the Institute. He had not tried to determine the full reaches of that freedom. He had kept to a self-imposed seclusion; and had largely occupied himself with writing various formal notes of protest—copies of which, he thought, would only reach Count Godfrey when and if the Terrans chose.

Now, however!

Partly out of idle curiosity, partly because the half-noted fading away of the Institute's busy daytime hum had made him restless, he decided to explore. He pressed his door switch. Nothing happened. He pressed the switch again, and yet a third time, holding it strongly closed for seconds. Still nothing; no movement of the door to open; not even the usual motor hum from overhead. A broken power circuit!

Still, that could be accidental. In the dimness—he had not yet switched on his room lights—he felt for the unobtrusive finger slots that made it possible to slide the panel if the power failed. His hand encountered only smooth and highly polished wood. Duke Harald turned the room lights on and let his eyes confirm the evidence of touch. His door had somehow seated too far home; the slots were now concealed within the jamb.

"Locked in," Duke Harald said then, softly. "But it's not official. I'll wager if I called a porter now, I'd be let out, and with apologies for the accident!"

But it was clear he was not being urged to roam the Institute, on this initiation night.

No matter. According to all reports, the ceremony did not start till midnight. He had time; his lock-box had arrived intact; and, even lacking both, he deemed himself a good enough mechanic to restore emergency power to that door.

Thus, well in advance of the striking of the hour of vigil, Duke Harald slid the panel back and stepped boldly into the soft illumination of the corridor. A flat black cap was on his head; a knee-length battle cloak swung loosely from his shoulders; and a brace of tiny pistolets was holstered at his sides.

Melton's initiation would, according to old customs, take place within the private chambers of his adept-tutor, Master Elwyn. The never-varied usage was for each successful candidate, at a time when formal graduation was not too distant, to be "received" by his master in a secret midnight rite; and then to spend the remainder of that night in vigil. That, at least, was the publicly accepted story.

It was a clever touch, Duke Harald had thought when first he heard of it. It added prestige, a certain quasi-religious sanctity to adepts who had kept the vigil. And it reminded him most strongly of the ceremonies on far Arkady, when a nobleman was first inducted into knighthood.

It was still a neat touch if—as he was now convinced—that ceremony hid the true creation of the telepath. And certainly, no other moment in an esper student's life was so well fitted to the covert administration of an unknown drug.

The various, separate buildings of the Institute were linked below the surface at subbasement level by a

dimly lighted maze of tunnels; which gave access also to computer vaults, library stacks, and miscellaneous storage spaces. Duke Harald knew them well. Even had he not had from the first some night's adventure such as this in mind, his military instinct would have driven him to learn the details of the system. And learn them he did: by dint of personal exploration, and the long scrutiny of variously acquired maps and building plans. Thus he made his way with speed and secrecy to Master Elwyn's building.

Calling an elevator from the upper floors, Duke Harald reviewed his knowledge of the building. Master Elwyn had his office on the topmost floor, well removed from the daytime hum and bustle of the lower levels. The suite comprised, he knew, an inner office, a small washroom and refresher, and an anteroom where during daylight hours a secretary-Cerberus held the portals. At night—particularly this initiation night—that guardian should be gone.

The entrance to the anteroom—the main entrance to the chambers—was almost directly across from the elevator shaft. There was a second door, rarely used, which gave direct access to the inner office. That was some twenty feet along the corridor, just before the passage turned to lead to an emergency staircase.

Up in the elevator, then, to the floor below the one which wash is goal. As the metal doors of the cage sighed shut behind him, Duke Harald was already racing cat-footed down the corridor, around the turn, and up the winding stairs to his first "check point." A quick glance showed him the corridor stretching bare and empty to the far wall of the building.

And now came the first really ticklish spot. Taking a case of tiny, glittering energy tools from his belt pouch, Duke Harald went ghostlike down the corridor; and began to trace the power leads to Master Elwyn's door. And as he worked, swiftly and precisely, he smiled in silent amusement. His door had been shorted out; he would now repay the compliment!

His circuit tracer flashed. Stopping the slow movement of his hand, holding it rock-still—a millimeter's error could defeat him—he read the tiny dial and marked his point of entry. Exchanging the tracer for a power drill, he sank a microscopic shaft to the indicated depth, and down it drove a silver grounding pin. Then—a quick re-check with his tracer, and this phase of the operation was complete.

And none too soon! Indeed, a faint humming from the elevator shaft warned him that his time was running out. And still another door to doctor!

Sweating with nervous haste, Duke Harald paused before the door of the inner office and forced his hands to repeat the cautious tracing of the hidden wires. Just as a soft pinging announced the arrival of the cage, he

found the junction he was looking for, marked it with a hasty blob of color—fortunately, precision was not so necessary here—and, battle cloak streaming from his shoulders, almost dove around the corner to the concealment of the stairhead.

Half crouching, hands on weapons, he waited then for any possible alarm. There was none. Only the sigh of the closing elevator and, a moment later, the distant muffled chiming of a bell. Silently, Duke Harald flattened himself to the floor and extended a tiny pocket mirror around the corner. The angle of sight was strange, and the view narrow. But it sufficed. He could see the length of the corridor, could recognize Melton standing before the door of the anteroom, could just discern the faint blue flash of the scanning light.

Cautiously Duke Harald stood erect. In his hands were two new instruments. From around the corner he could now hear voices.

"Well! Melton," came Master Elwyn's tones, "come in, come in!"

"But, master," the young Terran sounded puzzled, "the door—you haven't opened the door."

"Eh? What's that? Wait there, and I'll—" the adept's voice faded out. A brief pause—not more than ten seconds—and Duke Harald heard the sound of an opening door. He tensed; poised himself lightly on the balls of his feet.

Master Elwyn's voice came again, clearer, louder, and without the faint but unmistakable distortion of a caller-circuit. The jugglery with the door had worked; had decoyed the adept from his inner sanctum.

"Come in," said Master Elwyn, "at last. I can't imagine what has happened to this door. But we mustn't delay your initiation to—" And the *click* of a closing door cut off the sentence.

Now! Duke Harald plunged around the corner and came to a skidding halt before the entrance to the inner office.

Over the paint-marked spot on the wall he pressed one of his instruments. It droned faintly, and the door began to slide ajar. And as it opened, Duke Harald's other hand went reaching in, found the finger slot—and pressed into its shadowed depth a sticky-backed and tiny Sonotec. Then he removed his "opener" from the wall and let the door slide home. All this in the few brief seconds while the Terrans crossed from anteroom to inner office.

Duke Harald sighed gustily and wiped perspiration from his forehead. Then, unreeling a thin, almost invisible thin cable, he resumed his station at the stairhead. This time he was using a wired job; after his last experience he dared not risk even the tightest of microbeams. And now, he was ready to learn what really went on at the initiation of an adept!

"Now, Melton," Master Elwyn's voice came clearly along the wire, "sit

down, my friend. For two years you have persevered at what must have seemed a slow and thankless task. You have been forced to know yourself, to sound the earliest depths of memory, to lay bare the tangled roots of your most fleeting wish—and all for no more clearly stated reason than that your masters deemed it necessary."

"Why," said Melton slowly, "I formed my own opinion about that. Perhaps I should not have kept at it, otherwise."

"Quite," said the old adept, approvingly.

"I," Melton went on, "decided rather early that this training—or something very like it—was necessary. First, as a question of ethics; and then as a matter of survival."

"No need to hesitate. I know what you are going to say; and you are right, of course."

"Well, then. Ethics—because it concerns the fundamental Rule of Privacy. That Rule is basically, I think, an ethical conception. And I doubt," said Melton warmly, "that, without a thorough training in stability, in psychological self-knowledge, any human could be trusted to observe without exception the Prime Rule. The temptation to pry, to peek, to take a furtive mental glance—all, of course, for the best of reasons!—would otherwise be irresistible."

"What harm?" quizzed Master Elwyn. "What danger, in a small infraction?"

"Only the danger that in small infractions lies the seed of great abuses of the esper skill. And could society trust such power in unscrupulous hands? A power-seeking adept would have to be destroyed!"

("By Khrom!" Duke Harald muttered, listening at the end of his secret wire, "now I wonder if Duke Charles used arguments like that, when he talked the Council into voting my recall?")

"And so," came Melton's voice again, "observance of the Rule of Privacy is a matter of survival for the Esper Guild."

Master Elwyn spoke.

"But now," he said, "you know there is another reason for the training. A reason which has little to do with ethics or society, but which concerns most nearly your ability to take the final step?"

"I studied the papers you gave me; I understand."

"And you are ready to take that step? Prepared to accept the full responsibility of the esper skill?"

"I am."

"I must, then, ask your consent to an invasion of your Privacy."

"Knowing and agreeing with the reasons for this action, I so consent, fully and freely."

Question and response had taken on, almost, the air of an antiphony. There followed a long silence, while the adept probed the new initiate's mind.

"Excellent!" said Master Elwyn

finally, in the voice of one who gives an accolade. "I shall stay in partial contact for the next half-hour, until the drug takes hold; and in full rapport after that, for as long as you need my guidance in your vigil."

"And now—the drug?"

"Now, the drug. Bare your arm, please; here, under this sterilamp. I have the hypospray prepared. Five milliliters, intravenous—"

Now! thought Duke Harald, outside at the stairhead. He pressed a button, and a voltage surge passed swiftly down the wires of the Sonotec. Inside the adept's sanctum, the plastic case fell open with a quiet puff; a reddish liquid boiled away, diffusing its vapors through the room. Duke Harald waited, counting seconds. One, for the gas to take effect; and ten more, for it to disappear again, drawn off through the air ducts.

Then he moved. First the cable of the Sonotec; reeling that in, that nothing might be left to stir suspicion in a passer-by. And next the glittering energy key came into play once more. The master's door swung fully open now, and Duke Harald stepped within.

Two figures he saw there, and his hands released their grip on holstered pistolets. Master Elwyn and young Melton, slumped limply half across the surface of the adept's desk, heads pillowed upon outflung arms—snoring gently in relaxed and dreamless slumber!

One long glance Duke Harald gave them, to be sure the gas had done its work. Then his gaze swung, single-minded, to the slender glassite rod that, dropping from the adept's nerveless fingers, had rolled nearly all the way across the surface of the desk, trailing a thin line of moisture. The hypospray! And full-charged with the telepathic drug that was the goal of all this midnight burglary.

With cautious, trembling hands he took it. Carefully he sealed the open tip with sterile tape; carefully he wadded it about with handkerchiefs and stowed it in his pouch. He sighed then, inhaling gustily; half-conscious that he had been holding back his breathing for the past few seconds.

He looked about and something caught his eye: the sterilamp. Upset but still turned on, its flickering blue light shone full upon the white-haired adept's sleeping face. He turned it off. Now that the game was—almost!—won, he bore the Terran no ill-will. No need to let the old man wake an hour later to a painful case of sunburn.

Almost finished now! By Master Elwyn's silver-mounted desk clock, it was twenty minutes after midnight. Events were running well within his schedule. There was just one thing that needed doing. He had to get in touch with old Count Godfrey—what better way than by the adept's private visiphone? Any other set he might have tried to use would have been monitored; but not, he thought,

this one — not Master Elwyn's.

Swiftly he set up the calling pattern. And, waiting, drummed a ragged little rhythm on the desk. Then the screen swirled into glowing life. An under-secretary's face appeared—startled briefly out of well-trained stolidness by a flash of recognition.

"Get Count Godfrey!"

"Yes, your grace. At once!"

It seemed almost faster than that. Like a conjuring trick, the secretary vanished backward from the scanning field; and the ambassador's alert old features came to view.

"Here! I'll take it," said the count; then, turning his head, "Get you gone, Borrow; but wait in the outer room. I may have need of you further." Looking back again at Duke Harald, he said simply, "I've been waiting."

"Thought you might be," said Duke Harald. And a wave of affection kept him briefly silent. "You got my note?"

"Yes. I decided to give you a full day."

"And you've been sleeping by the phone, no doubt?"

"I was sure you'd call," said the old man, "before the deadline. Well?"

"Well—I've got it."

"The drug?"

"*The* drug," Duke Harald said. "Now—can you get a car to me?"

"Where, and when?"

"Corner of University and Twelfth Street. At"—he glanced at the clock, calculated swiftly—"ten minutes past one. That'll give me time for one thing more. And the rain will be falling."

"You'll get wet."

"Sure. But I won't get seen—I hope! Off, now."

"Off—and, luck!" said Count Godfrey as his image faded from the screen.

Back, then, through the tunnels to his temporary quarters. A journey without incident, without encounter; which was, perhaps, as well for someone. For the Arkadian, having gone so far, was grimly set to use his deadly little pistolets without parley or delay.

His first thought was for the contrivance that had let him use the "locked" door of his rooms. Dismantling it, he thus removed the only concrete evidence that he had been free to roam the Institute; free to do what had been done that night in Master Elwyn's office. For, he was coldly certain, when those sleepers awakened he would be under automatic suspicion. Not that he intended to be here when that awakening took place. But he reasoned—and did not trust the reasoning too much—if the only clues were that he had broken out of, not into the Institute, pursuit might then be baffled for a time.

Thus, he tore down carefully his jury-rigged circuit; and in doing so restored to normal usefulness the bed lamp that had been its power source. The room was set in order; and the

clock announced that it was time to go.

One last glance round before extinguishing the lights. Then back swept the heavy amber drapes before the window; out swung the casements, creaking slightly; and over the sill and down went Duke Harald, hand over hand down a thin tough grapnel line. The dark battle cloak swirled and flapped about his booted legs. The lock-box, slung from his shoulders by a twist of cord, jarred against his back with every downward foot. And ancient ivy clutched and rasped at him with leaf and branch and clinging tendril. But his feet touched ground at last. Duke Harald released his grasp upon the rope and wheeled about; stood motionless, breathing fast, peering with slitted eyes through the darkness and the thin warm rain.

No alarm—as yet! Shrugging the awkward box to a more easeful spot between his shoulder blades, he moved off. A few lighted windows stared at him with yellow eyes. The leaves of ancient trees rustled in the falling rain as he passed noiselessly underneath. And, from the distance, the thin whine of rubber on wet pavement reached his straining ears.

The rendezvous at last, and the appointed time. Shrouded in the dark length of the battle cloak, Duke Harald merged his shadowy outline with the black bulk of a lofty elm.

He had not long to wait. The tire whine drew nearer. A gayly painted three-wheeled vehicle appeared, slowing for the corner. Duke Harald hesitated, frowned. This was no embassy car; this was a public cab!

Then the cab braked smoothly to a halt. And its roof light flickered on and off—a coded signal which Duke Harald recognized. At a dead run he left the shelter of his tree and pounded across the sidewalk. As he wrenched open the door and vaulted in beside the driver, the car surged forward into speed.

Duke Harald caught his breath after a moment. Unfastening the lock-box, he tossed it lightly in the back. The driver spoke then, quietly, not taking his eyes from the road.

"Count Godfrey thought it better not to come himself, your grace. In case of any sudden inquiry, he felt he should be personally available."

"Of course!" Duke Harald nodded in agreement. "And your instructions were—?"

"To meet your grace, and bring you to the embassy by the fastest and yet most roundabout route."

"And this cab?"

"Rented, your grace—after a fashion." The driver smiled briefly. "Count Godfrey arranged it. The owner will wake up after a while—a little richer and a lot more puzzled."

"Your name's Borrow, is it not?" Duke Harald asked, studying the other's dimly seen profile. "One of Godfrey's secretaries?"

"Yes, your grace."

Borrow! Of course, thought Duke Harald; this would be the son of the old clan leader—and the father of the child—whose capture by the aliens had been so recently and vividly recalled to him. Well! By this night's work, that family tragedy was nearer to being avenged.

The walls of the embassy were a warmly lighted sanctuary. Duke Harald shivered slightly as he removed his damp and heavy battle cloak.

"And now," said Count Godfrey, closing the door of his private room and busying himself with the ever-present coffee maker, "don't you think it's time to break down and let me know what's happened? And what you're planning to do next?"

Duke Harald told him; succinctly but graphically.

"The next step," he concluded, "is for me to get back to Arkady. Before Duke Charles knows I'm coming; and before the Terrans think to close the local spaceways. You keep a courier-boat fueled and ready to go, I believe?"

"Yes."

"Well," said Duke Harald quietly, "tonight I'm going to steal it."

"Steal it?" For a moment the old ambassador looked baffled. Then understanding came, and he smiled.

"Yes," said Duke Harald. "Arkady needs this embassy on Terra. So far my actions have been, legally, those of a private citizen. And as long as we keep it that way; as long as you are careful not to lend me your ambassadorial sanction, then the Terrans can be as suspicious as they please. But in law they can't, and probably in practice won't, take any action to close up your shop. So you see—officially you cannot sign my ticket!"

"But what about a crew?"

"For a courier-boat? You forget I qualified in cruisers," said Duke Harald. "So long as the boat is stocked—"

"It is."

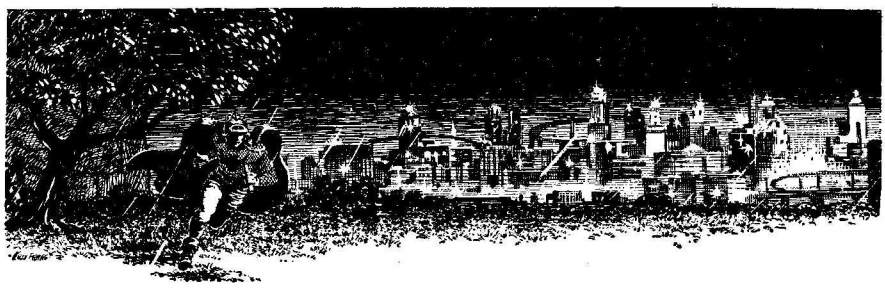
"Well, then." Duke Harald shrugged. Putting down his coffee cup, he rose to his feet, stretched, and gathered up his battle cloak again. "It's been a rocky night," he said, yawning, "but I'll not sleep sound until I'm out in space, high-driving it for Arkady. Now—where do you keep this spaceboat, and I'll be on my way."

The old ambassador began a protest, but was interrupted. Not, however, by Duke Harald. The door chimed softly, and its warning light winked on and off repeatedly.

"That's Borrow!" said Count Godfrey, suddenly nervous. Swiftly he turned the scanner on, studied his secretary's pictured face, and touched the door switch. Duke Harald, chill apprehension heavy in his stomach, shrugged back his battle cloak and rested his hand upon his pistolets.

The secretary entered; closed the door behind him.

"Sir! And your grace!" he said tensely. He held a little square of paper in his hand. "A Master Elwyn,



of the Esper Institute, is here, and asks a private talk with the ambassador."

"Master Elwyn!" said Duke Harald, grim-faced.

"Yes, your grace. And," Borrow stuttered slightly, "the servants tell me that the grounds appear to be surrounded."

"Surrounded?"

"Yes, sir. By armed police."

Seconds ticked away while the two Arkadian nobles stared at one another. Then Duke Harald laughed once; a bitter mirthless sound.

"Well," he said to Count Godfrey, "it looks as though you won't lose that space-boat after all!"

"But—what to do?"

"Invite Master Elwyn in, by all means," said Duke Harald. He relaxed a little from his tight concentration. His fertile brain began to see that this need not be checkmate; that one last move remained to him.

"Invite him in," he said again. "And admit nothing, deny everything—stall for time. But you know how to do it—you're the diplomat around here."

"And you?"

"Me? Oh, I'll be out of sight upstairs. You have a sterilamp around the place?"

"Yes. But—"

"Have Borrow fetch it to me, or show me where it is. I'll go to earth—temporarily!—in one of your spare bedrooms."

"Then, you're not going to break out?"

"Through a cordon of guards? And start a brawl which could bring war with Terra—if, that is, Duke Charles and the Council backed us up, which I very strongly doubt? No," said Duke Harald harshly, "unless my appreciation of the situation has gone completely sour, I've got one move and only one move left to play. I'm going to take the drug!"

And, without pause for further explanation, Duke Harald disappeared in the direction of the upper floors. He trusted his old friend to grasp the obvious, to see the need for this particular action. There were, he thought,

three clear advantages to be gained.

Destruction of the evidence was a main consideration. With the embassy thus guarded, he could not hope to smuggle out the drug in any usual container; and diplomatic immunity extended only to this building, and to the person of Count Godfrey. But—could they search his blood stream or his nervous system? With concrete evidence gone, between them he and Godfrey could befog the issue thoroughly. Psychomathematical deductions might be well enough on Terra. He doubted if they would stand up in interstellar law.

Again, possession of the esper skill might be a potent weapon. He could not know; could only hope. And in the end, to face the Terrans with a *fait accompli* should lead at worst to stalemate. At least, some bargain might be struck—Master Elwyn was surely not inflexible.

The guest room was comfortable; luxuriously furnished, even. But Duke Harald paid more heed to the thickness and opacity of the heavy drapes than to their carefully chosen colors. The carving on the oaken door was of less moment to him than its sturdy weight and sound-absorptive qualities. Satisfied that he was safe from outside scrutiny, he set about his simple preparations.

Not, however, without some twinges of anxiety. This was, after all, an unfamiliar drug. He knew too little of its action and its properties. He had not planned to take it here, thus hastily self-administered; but only back on Arkady, after careful analysis and animal assay, and with his personal physician standing by.

But this way! He repressed a shiver, as a discreet signal from the door heralded Borrow's entrance with the sterilamp.

"Well, Borrow," Duke Harald smiled thinly, "do you know what this is all about?"

"No, your grace. That is, I—" the secretary paused in some confusion.

"You're not supposed to know, but you can guess? Well, no harm in it, provided you can keep the secret."

Borrow nodded silently.

"And now," Duke Harald added, "if this drug works the way it's said to—just flash that lamp on my left arm, here—you can look forward to the first real counterstroke against the aliens in fifty years. There, that should be enough, I think. Now, take this hypo and . . . you know how to locate a vein?"

"Yes, your grace. These instruments are nearly self-locating."

Despite himself—despite the fact that the ultra-fine and ultra-fast jet spray went through the skin without an actual sensation—Duke Harald felt his muscles tighten. He grew a little dizzy. Just lack of sleep and overmuch imagination, he decided; and made himself relax and smile. Taking the empty hypospray, he wrapped it

loosely in a handkerchief, placed the untidy bundle on the floor, and crushed it underfoot with grinding heels. Bending and picking up the wadded mass of cloth and broken glass and twisted metal, he tossed it in the wall incinerator chute.

"And now," Duke Harald said, and matched the words with action, "I'll just stretch out on this bed and wait. Thirty minutes, more or less; then things are supposed to happen."

The half hour dragged along. Borrow, apparently on orders from Count Godfrey, waited in an easy-chair, quiet and scarcely moving. Duke Harald felt vaguely glad of his presence.

At last the necessary time had passed. Confidently, Duke Harald reached out with his mind and groped for contact with the secretary. Nothing! Not a whisper yet; only blank mental silence.

He let five minutes more go by and tried again, this time more strongly. Still nothing.

Was there, he wondered, something he had failed to learn? Some trick of the mind, some knack like—he let his thoughts drift back to boyhood in search of an apt comparison—those hours he had spent without success, trying to—

"Can you wiggle your ears, Borrow?" he asked suddenly, completing the thought aloud. Then he noticed Borrow looking at him strangely, and the apprehensive, puzzled glance touched off a more erratic impulse. Shouting with laughter—while a corner of his mind looked on in helpless wonder—he tore a pillow from beneath his head, poised it carefully; and let it fly!

Borrow leaped to his feet and fled the scene of action.

Duke Harald bellowed jesting comments after him; and fell back on the bed, choking and gasping with mirth, wiping tears from his eyes.

Tears!

But they were more appropriate than laughter, now that he came to think of it; now that the esper drug had failed. For this was surely not telepathy. Far from it—this was more like sottish drunkenness. A swift depression seized Duke Harald, and he wept in truth, rolling on the bed, burying his face in the remaining pillow.

Exhausted, he lay still at last in a dull stupor. Vaguely he became aware that others had entered the room. He recognized the voice of Master Elwyn.

". . . And I tell you that the drug does work. That it has worked! But in this matter, words are—"

Words, words, words! These are but wild and whirling words my lord. Laughter began again to bubble in Duke Harald's throat.

"But—I do not understand—he said the drug was harmless!" That was Count Godfrey. The faint, protesting voice came thinly from the distance.

"Physically harmless. That is true.

The drug produces total sensitivity to thought—to any thought. And what is closer to a man than his own mind? Even his own unconsciousness, with its long forgotten memories, its tangled and forbidden wishes? Expose an untrained consciousness to that, in its entirety, and—"

And then the drug took firmer hold. Within Duke Harald's mind there grew a feeling of relentless pressure, of conflict, of barriers giving way before an almost overwhelming onslaught. He shouted loudly with exultant laughter—and, almost in that very instant, felt himself begin to weep with all the hopeless desperation of the damned.

A noiseless roaring filled his world. The most intolerable sound that he had ever heard or dreamed of, was here increased a thousandfold; raised to a tooth-grating pitch of shrill unbearable unpleasantness. And with it —adding to it, if addition could be possible—was the bleak assurance that the horrid thing would still go on; would never cease. Never, never, never—

Never, unless he stopped it.

That single thought became the final weapon of the entity that had been, and would be once again Duke Harald. And with that final weapon he began to fight. How, or in what fashion he could never after tell. For all of that most singularly awful episode was barred to him in later days.

But fight he did. His two months' training, scanty though it was, may well have helped. And it is possible—nay, probable—that Master Elwyn violated his Prime Rule of Privacy and reached in a helping mind. But in the end it was perhaps a certain bedrock strength, bred in the bone and inmost core of generation after generation of a warlike race that had never known surrender; this it was what served and saved him.

And so Duke Harald fought. For long without real hope, with nothing to sustain him but that ultimate refusal to admit defeat. And gradually, and slowly he began to win. Began, in some vague manner to remake old barriers and to build new ones; began to stem the howling mental tumult.

Quiet at last! The final shield was fitted into place. His thoughts moved slowly now, but only with the slowness of exhaustion. He sank parsecs-deep in slumber.

Coffee aroma, drifting through the open door, awakened him at last. His first thought was that he was hungry. Eagerly he sat up; and discovered, first that someone had removed his clothing while he slept; and, more important, that a full twelve hours had elapsed.

Swiftly he dressed. And as he did so, Duke Harald let his mind scan over what had happened. He had taken the esper drug; that much was clear. But afterwards? His memory showed a curious blank—empty of

content, yet filled with a shapeless sense of horror from which his thoughts drew back. To his surprise, he found that he was shaking. He had to sit upon the bed while he regained control; and perspiration started from his body.

Well! he thought. He had taken the esper drug. But—had it worked? Uncertainly, he tried to contact other thoughts. Just for a moment he seemed to catch a vagrant whisper from outside. But he was not sure. It could have been imagination.

Driven as much by puzzled apprehension as by hunger, he trailed the scent of coffee to the lower floor. And there he found Count Godfrey, Master Elwyn, and the answer to his riddle.

"Why is it," Master Elwyn asked, sipping coffee while Duke Harald ate, "that humans are not ordinarily vested with the esper skill?"

Duke Harald only stared at him. The question seemed to be rhetorical.

"Because," said Master Elwyn, "of the many aberrating processes which comprise the loosely-named unconscious mind. These processes are unconscious because they are dangerous; because they threaten the integrity of reason. We all acquire barriers against them, strong defenses.

"Unfortunately, our mental screens are not selective. They act most strongly against outside thoughts. In the natural state, telepathy is very near insanity. Indeed, it has been known for centuries that some psychotics—paranoid schizophrenics in particular—are weirdly sensitive to the mental states of others. And so the mind's protection keeps it shut within the skull."

"And the drug?"

"Inhibits the defenses. There you have the basic reason for the training. We try to draw the fangs of the unconscious; try to stabilize the conscious. Only the integrated mind can tolerate the esper skill."

"If that's the reason, why the secrecy?" Count Godfrey sounded skeptical.

"How many would believe they were not strong enough? Indeed, those who are least fitted would be most convinced of their superiority. Fools rush in where saner men might hesitate. Would you have us release an instrument of mass psychosis?"

"But the rumors?" asked Duke Harald. "The so-called myths? What of them?"

"To Terrans, they are only that—myths. We of the Institute originated most of them, in a calculated program of security. No one believes them in the slightest."

"I believed them," said Duke Harald.

"You are not a Terran. Such social-psychological factors are, of course, conditioned by the planetary culture. You men from outer space," admitted Master Elwyn, "have always been our gravest danger."

There was one more point that

bothered the Arkadian. He brought it into the open.

"It seems to me," he said slowly, "that this secret, being known to us, is now no longer secret. Or do you trust us not to speak?"

"No," said the adept, firmly. "I will be frank, your grace. This embassy is under guard. It will remain so, until you agree—as Count Godfrey and his secretary have agreed—to submit to a permanent hypnotic block against revealing what has happened. That is why I am still here."

"I see." From the Terran's point of view it made, of course, an obvious final safeguard. And there could be no question of refusing. Still—

"One thing more. This treatment: will it rob me of the esper skill?"

"Esper skill? Why, you have none."

"But—the drug?"

"Your grace," said Master Elwyn with slow patience, "have you noticed any sign of telepathic power?"

"No," admitted the Arkadian. And added, stubbornly, "But I haven't really tried as yet."

"Try now," invited Master Elwyn. "Try to read my mind. I give you full permission—nor will I set up barriers against you."

Long seconds ticked away and added up to minutes while Duke Harald tried.

"Is there some special method?" he asked at last. "Some trick of the mind that I should know?"

"No, your grace. There is no trick. It is no harder than to open your eyes."

"Then," Count Godfrey asked the puzzled question, "did the drug work, or didn't it?"

"It worked—last night. And brought psychosis in its train. However—and I'll try to keep the explanation simple—in overcoming that delirium, in re-establishing his defenses against his own unconscious, Duke Harald thereby nullified the action of the drug. And canceled, I am certain, any future chance of using it."

"Very well, then." Confronted thus with total overthrow of all his plans, Duke Harald spoke with difficulty. "Very well, install your hypnotic block—and have done!"

"I must first," there was sympathy in Master Elwyn's tone, "ask your permission to explore your mind. Only thus can I obtain the data necessary for sure action."

"Permission granted," said Duke Harald. At least, with the block in force, he would not have to talk about this episode, even to Count Godfrey. There would be no unwanted sympathy. He closed his eyes and waited; and wondered if he would feel the contact when it came.

"Is something wrong?" That was Count Godfrey's voice. Duke Harald raised his eyes, to see a look of sheer bewilderment on Master Elwyn's face.

"This," said the Terran adept slowly, talking rather to himself than

to the others, "is incredible! Incredible," he repeated, looking at Duke Harald oddly. "May I ask another favor of your grace?"

"Why," said the Arkadian, as excitement suddenly possessed him, "yes, by all means. But what has happened?"

"I would like you to delay your journey home to Arkady," said Master Elwyn in some agitation. "I would like you to come to the Institute for thorough scientific study!"

"But why? Have you detected traces of the esper skill?"

"On the contrary." The old man stood erect, began to pace the floor. "Not that. But—I cannot read your mind!"

The two Arkadians only stared. Not being Terrans, for a moment the full meaning of that statement—from an adept!—did not register.

"I think," said Master Elwyn finally, "that I can guess what happened. But it will take the full resources of the esper laboratory to elucidate the details. However, here is what I think: To overcome your psychosis of last night, you had to rebuild all your mental barriers. That, I explained before. But now, it seems, you have gone further and installed new ones. For the first time in the history of the Esper Institute, a mind has been encountered which is completely screened!"

Events had been happening too fast for Duke Harald. He was still a little fuzzy-minded from exhaustion. It remained, therefore, for old Count Godfrey to seize upon the other implications of the situation.

"Completely screened?" he asked. "No one can read his mind?"

"No one," said Master Elwyn.

"Not even an alien life form?" Count Godfrey was insistent in his probing.

"Not the ones that trouble you on Arkady," the adept said, and glanced at him with understanding. "That much I can assure you."

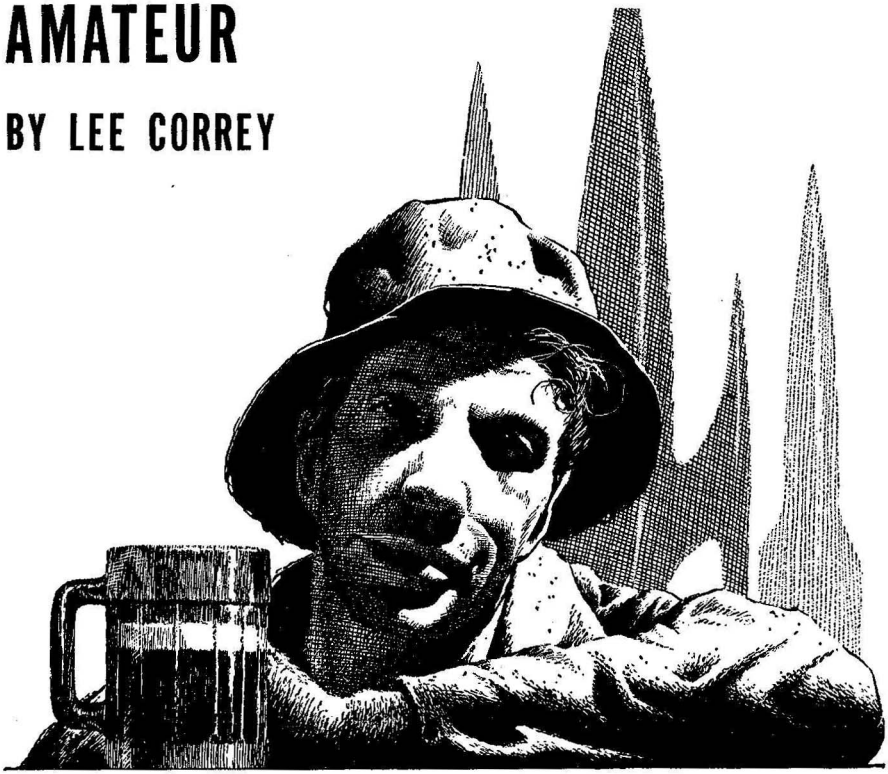
"Then," said the old Count Godfrey, looking at Duke Harald with an eye of shining triumph, "this is success, not failure, after all! If you can make a battle plan and keep it secret from the aliens—

"Sire," he said, and stressed the ancient title, "you have found your royal road!"

THE END

AMATEUR

BY LEE CORREY



A new thing, *a new way, must affect the Old—even if the Old is still new. And a man of rigid mind can die with his beliefs, instead of for them!*

Illustrated by van Dongen

"Fill her up again, Martin."

Martin, the bartender, looked coldly at him, pursed his lips, and said slowly, "Sorry, Enright. No more."

"Put it on the cuff, Martin," Henry Enright replied in a bluff tone. "My credit's good."

"Yeah? You ain't paid a cent over this bar for two months," Martin pointed out, wiping his hands on his apron. He then put his hands on the wet bar top in front of Enright and went on indifferently, "The boss just told me no more. Ya see, he just made an agreement with the bank: they don't sell liquor, and we don't lend

money. We don't run no hock shop, either; so don't try to gimme your watch for a drink."

Enright was just a bit tipsy, but that was not unusual. He had a vague recollection that this had happened before in other bars. In fact, he realized he would not be drinking here in this dark and dirty dive except that, up to now, Martin and his boss had been easy on him.

He pushed back his stool and let it fall to the floor. Looking slowly all around, he addressed the five other patrons, each as shabby as himself. His voice was loud and his words slurred with alcohol. "Did you hear that? Martin just said my credit's no good! Me, the best rocket engineer in the business! Why I've burned up more alcohol in sixty seconds than this lousy joint's ever poured! Now I can't even get two ounces! I'll take my business somewhere else!" He staggered toward the dim outlines of the door and thrust his way out into the murky twilight.

One of the customers jerked his thumb toward the door as it slammed shut. "That guy must be nuts, Mart. They ain't no such thing as a rocket engineer any more, is they?"

Martin was calmly wiping the bar with a dirty rag around the place where his former customer had been. "Nope. But that guy will always be one."

The cool air of evening served to clear Henry Enright's head as he walked down Larimer Street toward the Denver railroad yards. Everything's going to be all right, he told himself as he walked. Old Hank Enright's still the best engineer in the business. Wasn't he the expert and authority on rocket propulsion? O.K., he admitted to himself, the business is in a slump. But it'll bounce back. It's got to, he reasoned. There's too much invested in it. The space station's still up there, and they've got to have rockets to supply it, don't they? This is only temporary; it can't last.

But in the back of his mind he knew he was lying to himself. He knew, as he'd known for the last two years, that the science of rocketry was dead.

He looked down Larimer Street, raising his eyes from the dirt and poverty, in time to see a silvery blob of light catch the evening sunlight as it rose. He followed it until it finally faded from sight into the purple sky at the zenith.

"Hey, Mac, get outa the street!" the shout of a cop brought him back as traffic started to stream past him with a roar of motors and a blast of horns. He scrambled out of the middle of the intersection and made it to the curb miraculously unscathed. Then he looked up into the sky again. Venus was shining brightly up there above the Rockies.

He swore loudly and bitterly, partially at the flowing mob of people that pushed and jostled him, but

mostly at the silvery blobs of light still rising from South Denver Port toward the moon and planets.

Once there had been tall, sleek rockets climbing up to the satellite, shaking the ground as they reached for the sky. Now, the space craft of the new order were rising silently and easily to the planets themselves.

All this because of Bill O'Neil, Enright thought bitterly. A rocket technician who went and destroyed the science of rocketry, the very thing he worked with!

It was painful to think about. Bill O'Neil had been a good rocket technician in spite of his lack of formal education. In his time, he had known all the little tricks and idiosyncrasies of rocket motors and the fiery pits in which they were tested. But O'Neil had been other things, too.

Enright thought back, letting his memories of the long years keep him company as he walked his solitary way through the crowd.

He'd first met O'Neil . . . let's see, when was it? Back at White Sands in '63. He could never forget the Form 57, Application for Federal Employment, that had landed on his desk that day. There were fifteen sheets listing Bill O'Neil's experience tacked onto it. He had chuckled as he noticed that O'Neil had been a tractor mechanic, a crop-dusting pilot, a chicken farmer, communications officer on a Pacific tramp steamer, a detective story writer, a trumpet player with three name bands and the New York Philharmonic, a journeyman welder, a news photographer, a rig foreman in the Peruvian oil fields, a summer camp counselor for Indian lore, a special-effects man in Hollywood, overseas computer repairman for IBM in Europe and Arabia, and a machinist for Reaction Motors. Enright had O.K.'d his application because of the last-named job.

O'Neil also claimed in the application to have held a patent on a transistor-switching circuit, an improved trumpet mouthpiece, and a modified color-film process for which he was receiving a small royalty.

Enright remembered the personal interview with equal clarity. He had been amused at the time. O'Neil had admitted he didn't have much experience in rocket motor testing, that he wanted to learn it anyway, that he was here because he liked the climate, and that he would most probably stay in rocketry because it was new, changing, and had a lot of promise. What really cinched the job for him was when he told Enright he'd been interested in space travel for a long time and wanted to get in on it now that he had the chance.

Enright put him to jockeying a wrench on Test Stand No. 9. In fourteen months, he was crew chief. Two years after he'd first walked into Enright's office, he was chief mechanic over all test stands and Enright's righthand man. Together, the two of

them ran the largest testing operation in the country, and there was not an hour during the day when the now-silent Organ Mountains had not echoed back the blast of static firings and splashed the flowing flames from their granite slopes.

White Sands was now slowly blending back into the desert from which it had risen.

Then O'Neil had gone with Enright to help found Propulsion Research in Denver. He had been indispensable to Enright in those days. He was full of new ideas and ways to improve the thundering monsters on which they worked. He was quick to grasp new concepts and eager to simplify, improve, and attempt new things. Enright had to restrain him, for the technician wiped out half a million dollars worth of rocket motor and equipment one day trying out a new and faster starting sequence of his own devising. The stand plumbing and not the sequence itself turned out to be at fault, however, and together the two of them finally got the bugs out of the oxygen-hydrogen motors and developed them to such a pitch of perfection that they started and went to full thrust in less than a second. At the big test stands near Devil's Head, they evolved the most powerful and efficient motors of the time. Henry Enright and Bill O'Neil were the best team Propulsion Research had; they *were* Propulsion Research, and the board of directors knew it.

In the meantime, Bill O'Neil took a Denver mine equipment company for about a million dollars because he'd worked out a method of improved flotation processing which gave a better yield. And an offshoot of this, a method of getting germanium out of old mine tailings, started bringing in royalties from RCA and Western Electric. But O'Neil stayed with his babies, the big test stands at Devil's Head, because the satellite was out there by then and he wanted a bottle of Martian canal water.

The test stands at Devil's Head were now mute monuments to the past, their concrete walls and flame pits crumbling under the forces of wind and water.

The mere thought of it almost made Enright weep as he trudged along with the night deepening around him. But the darkness seemed almost artificial in the spots where the glare and glow of the neon lights cast shadows into the alleys. A chill wind swept down the street, and there was just a hint that there might be snow before morning. Enright pulled his jacket tighter about him and shivered, wishing he had not pawned his overcoat. And if it did snow, there would be no heat in his shack unless he was able to pick up some driftwood along the Platt River. There was very little lump coal along the railroad tracks any more.

A sign in a pawn shop window, brilliant and garish in fluorescent plastic

letters, attracted his attention. He stopped to view the display it heralded.

GENUINE MOON ROCK

Guaranteed to contain uranium, gold, silver, tungsten, and other rare metals.

All Pieces Souvenirs Of The First Moon Expedition!!!

YOUR CHOICE:
$1.00 EACH !!!

There were a few pieces of black rock which could have been basalt from the nearby Rockies. And there were a few chunks of metal allegedly parts of the ship. And, prominently displayed, there was the much-publicized and very familiar picture of Bill O'Neil, clad in a spacesuit and holding aloft the wire-braced flag of the U. N. with Mount Pico in the background. Their shadows were sharp and very dark, the shimmering disk of the Earth hung over the lunar mountain, and in the corner of the picture was a segment of a squat, fat, disklike ship, the *Venture*.

No tall, slender, silver rocket. Not even the rocket-powered Erector set evisioned by the pioneers of the '50s. Not even a sign that the lunar rock had been blasted and washed by a jet flame.

Every time he saw that picture, it made him sick at heart. These days, he saw it often—everywhere he went, he seemed to see it. It reminded him more often than was necessary that the thing for which he'd fought and labored all his life had failed, that his dream of rockets climbing on their noisy, fiery tails toward the new frontiers of man had been shattered, that his life and his work had been useless, rendered obsolete by new things which had done in five years what rocket propulsion had failed to do in fifty.

He wanted a drink. Sometimes that helped him forget that his life was a failure. As he started to turn around, he remembered that Martin had cut him off. The last place, too. That left only home. "I think," he said aloud to himself, "that I've still got some of that stuff Big Jack made and was going to throw away." Terrible stuff, he knew. And the thought of it almost turned his stomach. But it contained alcohol, it was free, and it was palatable if you filtered it through a loaf of bread. He started down the street again and unconsciously picked up his train of black thoughts again.

Try as he would, he still could not make himself believe that there were no more rockets. Why, weren't they the only means of traveling in the vacuum of space? But that part of his mind which still faced and knew reality told him: "No. Bill O'Neil has found another, better way. Rockets are obsolete. Space travel is here, but there are no rockets."

When had this happened? Enright

was not sure, but he seemed to recall a morning at Devil's Head long ago when Bill O'Neil had dropped into his office for a cup of coffee and a chat. That morning, O'Neil had had something on his mind. It had been an idea; Enright could never figure out how he knew that O'Neil was on the trail of something different; but every time he was, the engineer could sense it.

"Henry, I've got an idea," O'Neil had said as he poured himself a cup of coffee.

"That's not unusual for you, Bill," Enright had replied. "What fantastic money-making scheme have you dreamed up this time?"

Sitting down with his coffee, O'Neil had answered, "I haven't started worrying about the financial end of it yet. It's an idea I've had for a long time, Henry—ever since we were working on the orbital rocket project. After kicking it around upstairs for years, I think I'm finally starting to get something concrete. I got to thinking about the way we gotta fight gravity all the way up to that satellite, then fight it again coming down. Seemed to me there's a simpler way to do it. And I'm beginning to get part of an answer. Henry, maybe there's a way we can use gravity instead of fighting it."

"Ever hear of maneuvering through a gravity well? Oberth figured that out years ago," Enright told him.

"Sure, but you gotta get out there first, and that's always been our big problem. Shucks, we take all our big losses just breaking free of the Earth. After you get out there, you can get to Mars with an armload of jatos. Now, Henry, I ain't no mathematician, but I know Einstein figgered out that gravity was something like electromagnetism. And Hlavaty checked him and proved the old boy wasn't talking through his hat after all. The only trouble is, nobody's figgered out a way to prove by experiment that the Generalized Field Equations are the basic law of the universe. Cantor and Gunther developed the math to handle it, and managed to tie matter-physics in with the space-physics of electromagnetism. That multi- and non-dimensional math looks like so many chicken tracks on paper to me, but from what I can get outa the abstracts maybe we can figure out a way to make gravity work *for* us—like the way electromagnetic fields do in an induction motor and a magnetron. And if gravity is something like a magnet yanking a chunk of steel to it the way Akahito thinks, maybe we can do like in an unduction motor when they throw another magnetic field in to oppose the first one."

Enright had never managed to follow Einsteinian physics very well, since it was afield from rocketry, but he had remarked to O'Neil, "Bill, in order to do that, you'd have to

have a gravity field stronger than the one that's attracting you. It'll take a lot of energy."

"I know that. But we got plenty of energy sources."

"And in order to overcome gravity, you've got to do work, apply a force to move your object a definite distance. Have you ever figured the work required to raise one pound of mass out of the Earth's gravity field?"

"I ain't never figgered it, Henry, but I guess it must be plenty. Got a slip stick?"

."Never mind computing it. It's tremendous. And you've got to perform that much work and expend just as much energy whether you fire that object from a gun, push it with a rocket motor, or use some sort of force-field gimmick. You don't get from here to Mars merely by thinking about it and writing an equation on a blackboard. If you could build an antigravity device, you'd never find a power source for it. Sure, we have a lot of potential available from the atom, but we've been trying to harness that to a propulsion system for years without success. The only thing we've got on hand that we can harness is chemical energy. And by using this chemical energy in its most efficient form, we've *already* developed an antigravity device."

"Yeah?"

"Yes. A rocket motor."

"Sure, Henry, but it's like using a steam-driven piston to fight a magnetic field. We ain't meeting gravity on its own terms! So it takes a lot of power. But we've got big energy sources to tap. Maybe we'll have to start with atomics and convert back and forth with chemical and mechanical energy three or four times to do it. But I think we can power an antigravity gadget if we sneak up on it the right way."

"Perhaps. Perhaps you can provide enough energy. But have you the slightest idea what you're going to sink it into? A lot of really high-powered brains have tangled with antigravity before. They failed. Do you think you can do it?"

O'Neil had scratched his head and replied, "I'll try anyway. I went down to the Denver Library last night. Marge was working in the darkroom, and I didn't feel like sitting around by myself. Besides, I didn't want to clean up the fractionating tower and that pile of plastic in the garage just so she could get the car in. Well, at the library I dug out all they had on unified field theory and picked up some of the progress reports from the MIT labs on the satellite. Boy, they're doing a lot of stuff on gravity up there! Took the whole pile home and read to four in the morning. Had to sleep on the couch; Marge didn't like me staying up that late, but she's the early bird in the family.

"Henry, those MIT reports were downright interesting! Judging from

them and a lot of other things going on up there, I think we're missing the boat. We got some funny notions about physics and engineering down here on account of we've always got a gravity field around us and a layer of air that stays pretty well inside a small range of temperature and pressure. You'd be surprised at what happens to a lot of chemical reactions at minus two-seventy-C under no pressure. Even the Earth's magnetic field sets up one whopping circulating current on the cold side of the satellite because the steel's a superconductor at them low temperatures. But they're learning something about gravity, on account of there ain't none up there. They've plotted what they call isogravs, lines of equal-g, and riding parallel to them seems to do funny things. I'm boning on the stuff, Henry, because I'm pretty sure I can build me a gadget that will give antigravity or something like it."

Enright had sighed and thought to himself that O'Neil wouldn't be the first one to be fooled by the notion of antigravity. After all, O'Neil had said what many other men had said, and antigravity was still a science-fiction pipe dream. So he'd told him, "Bill, you're a smart guy with lots on the ball. You may think you've got a good idea, but let me put you wise to something. A lot of people have thought that antigravity was the answer to all our space travel problems ever since H. G. Wells dreamed up his Cavorite. And there have been a lot of electronic nightmares designed—flat plates, weird coils, odd electrodes, and the like. But every one of those antigravity devices were like the perpetual motion machines. The inventors had overlooked a couple of basic physical laws at the outset. The gadgets looked good until an engineer or physicist got hold of them and pointed out where they violated a physical law. And when the inventors tried them anyway, they didn't work. Why? Because the antigravity concept is not a realistic one in the first place.

"Secondly, there are certain basic physical laws which govern the working of the universe. A new law never causes an old one to become invalid; it may merely extend the limits over which the old law applies. But the new law never breaks an old one. If you're going to keep your feet on the ground, you've got to face the reality of this. We'd like things to be different, all of us. But they aren't.

"Bill, this is the first time you've come into my office without your flaps down and flying straight. Well, come back on the ground. The rocket motor is the *only* propulsion system that'll get us to Mars. There are lots of problems, I'll grant you, but we're making headway. Let's keep working on them, eh?"

O'Neil had looked quietly at him and said, "Henry, that's the same kind of answer I've gotten out of a lot of high-powered science-johnnies before. I didn't think you were that kind. So this ain't new to me. I've had everybody from farming experts to mining engineers to electronic scientists tell me something was impossible. Take my automatic valve for the control of ignition mixture ratio. Evans thought it was a joke, but it worked. Put us in business here, didn't it? And how about your injector design, and your theories of combustion and flame fronts? Nobody thought they'd work, but they did, and then everyone ran around saying they knew it all the time, didn't they?"

"Sure, Bill, but those people were sitting back at their desks and in their labs while we were having burn-outs, hard starts, and rough combustion when the mixture ratios went sour. We were building rocket motors; they were building personal empires. We licked our problems and delivered the goods, even if we did have to fight them all the way and listen to them chuckle as they collected their bets on how far out in the desert the chamber would land. But we were fighting people, not the universe. And we never broke a physical law, even when we applied new ones. Bill, you can't turn against What Is."

O'Neil had looked pensive and replied, "Sometimes, you gotta . . . if you're gonna reach What Can Be. You'll see I don't discourage easy, Henry. If I can't break physical laws, maybe I can find a way to use other ones."

So Bill O'Neil had gone to work in his garage shop. He had never spoken much to Henry Enright about what he was doing. He showed up bright and early every morning, as usual, full of driving energy. He kept it up all day. He was, as usual, also a sympathetic and understanding slave driver with his testing crews. This puzzled Enright, who had noticed lights burning late at night and far into the morning hours around O'Neil's house. Sometimes, on week ends, the lights burned all night. O'Neil never asked for advice, nor discussed what he was doing in his off-hours. The man's constitution seemed fantastic to Enright. And when he asked O'Neil about the garage gadgeteering, Bill had always been noncommunicative. He merely shrugged his shoulders and grinned.

Then had come the day when O'Neil gave his thirty-day notice. Enright had been shocked. "Why, Bill? Great Scott, it's been eight years! We're a team! What's the matter? I can't believe you're unhappy here."

"Well, Henry, I've got some hot irons in the fire—and I've sort of lost interest in rockets. I liked work-

ing with you fine. We did a lot together. In fact, eight years is the longest I've ever held one job. But I've got a notion to strike out on my own now. I've got a couple bankers putting up the cash for me to set up and develop my gadget."

This wouldn't be the first time unknowing financiers had been taken by a likely looking gadget they didn't understand, Enright knew. And it was a hundred-to-one anyway that, providing it did work, O'Neil would be taken to the cleaners by the money boys. "You mean you finally got an antigravity gadget to work?" he'd asked with tongue in cheek.

"Naw, not yet, Henry. I got all the groundwork done and the plans laid out. The patents are being held up until I can show that it works, and I need more equipment and money to do that. If it don't work, I've got some more ideas that will."

In three years, Bill O'Neil's ideas had changed the course of history and put Henry Enright out of a job. But Enright didn't realize that at the time.

He'd read about the O'Neil Drive when it was first announced by the new Western Space Craft Associates, Inc. He didn't understand it exactly. In fact, nobody seemed to understand much about it. The theorists were busy regrouping their ideas and concepts of Maxwell's electromagnetic laws and Einsteinian physics. There were those mathematicians, mostly nondimensional analysts, who took the attitude of having known it all the time.

However, most of the experts and

authorities seemed to agree on one point. They could not understand how Bill O'Neil had done it. There was a great tendency among them to feel that O'Neil had stumbled onto it by blind luck. After all, he had had no formal training in the elements of high math, theoretical physics, nuclear and sub-nuclear physics, spatiophysics, electromagnetics, and unified field theory. Yet he had founded the new science of gravitics and had put it to practical use.

The O'Neil Drive was just as baffling as the way O'Neil had developed it. It was large and required a tremendous energy source, but it could drive a ship out of the Earth's powerful gravity field. The power source was extremely complicated and approached an unbelievable ninety-nine per cent efficiency. The actual drive unit itself was as deceptively simple in appearance and construction as an electrical transformer. It didn't look like it could work, but it did.

And, most amazing of all, Bill O'Neil was in control of his company. He had matched wits with the financial brains of the world and had come out of the game one-up. His patents were so basic and his drive unit so indispensable that he also became "Mister Space Travel." When he landed the *Venture* on the Moon, the entire Solar System became his plaything, lock, stock, and barrel. Rockets were no longer the only way, they were not even the best way, so they were abandoned.

It did not happen overnight, but when rocketry collapsed, it did so with a bang. Enright remembered the day with bitterness. He had just successfully completed the development tests at Devil's Head on the first catalyst monopropellant unit. He had advanced the science of rocketry, and he had been elated that day.

That had also been the day when Propulsion Research common stock dropped from 67½ to 9¼ in four hours on the New York Exchange. The government had dropped three big P-R contracts in favor of the O'Neil Drive. Devil's Head never got off another run. Propulsion Research went into receivership five months later. Enright had seen his beloved test stand equipment and machine tools auctioned off. It left him a broken man, his life shattered and sold to the highest bidder.

He turned off at the tracks and waited while a fast freight passed, its turbine locomotive howling at him with a sound akin to that of his beloved rockets. Beating his way through strings of empty freight cars in the marshaling yards, he wound his way around a smoldering slag heap from a nearby smelter and started down the muddy flats of the Platte River.

There was a light glowing in his

shack he noted as he reached it.

He didn't remember having left it on, but he'd gone out in a hurry for that drink at Martin's. He realized he was getting forgetful lately. Have to watch it after this. Shrugging, he pushed open the door and went in.

A stocky, heavy-set man got up from a box in the corner. His pugnacious Irish features were set in a half-smile. "Hello, Henry. I knew you'd come back if I waited long enough."

Enright stopped dead, his hand still on the door. He shook his head violently, thinking the alcohol was making him see things again. But the man didn't disappear. Throwing the door open again, Enright made a quick jerk of his head. "Get out! You've got no business here!" he snapped at Bill O'Neil.

"I've got something for you, Henry. I spent a week trying to find you to give it to you." O'Neil's manner was quiet. He didn't move from where he was.

"I don't want anything you've got! Get out!" Enright shouted.

O'Neil folded his arms and rocked back on his heels, making no move toward the open door. "Henry, stop thinking you're the boss. You never were, and you're not now. You're just an ordinary Larimer Street bum full of booze." O'Neil had changed in the last two years. His language had improved somewhat, and he had the assured manner that signifies one has matched wits with the most powerful men in the world on equal ground. "I didn't come here to help you, because it seems you don't want to be helped. But I came here to give you something, and I'm not leaving until you get it."

"I said, get out!"

"Henry, you know I used to slug it out on the circuits as a heavyweight. You couldn't throw me out. You look like you ain't had a square meal in a month, besides. So forget it. Shut that door, Henry, and sid-down!" It was an order. Given in the same tone of voice Bill O'Neil had used with his test-stand crews on occasion. There was no arguing with a person who could make the toughest pipe fitter in the business knuckle under.

Enright glared at him for a full minute, then slowly closed the rickety door without taking his eyes from the former rocket technician. "What are you doing here? What do you want?"

"I came to give you something you wouldn't come and get for yourself. I had it splashed all over the newspapers so you'd maybe see it." O'Neil paused. Enright didn't say anything, so he went on, "You see, the International Astronautical Federation met in Los Angeles last week and gave out a brand new award. Only men who've contributed to the conquest of space get it. It's the highest honor they give, Henry. Von Braun, Sänger, Bridgeman, Peterson, Eaton, and myself were nominated.

They decided on me, but I didn't want it. What I did wasn't the result of a life's work; I just got an idea and I didn't have to sweat over it much.

"I asked them to give it to you, Henry. You were the one who got me really interested in space travel, and you were the project engineer for the first satellite.

"We couldn't find you, though, so I told them I'd deliver it to you. Took me a week to find out where you were." His hand slipped into his coat pocket and pulled out a small, flat, blue box. He thrust it toward Henry Enright. "Here it is, Henry. We all thought you deserved it, so you've got the first Goddard Medal."

The engineer slowly put out his hand and took it. Opening the lid, he discovered a gold medallion with a *bas relief* of one of Dr. Goddard's little rockets rising out of its tower at Roswell. Good for five bucks at Benny's.

No. Not this. This was not something to pawn.

His mind was a maelstrom of confused thoughts. Slapping the cover shut, he dropped down into a chair with no back. Somehow, he was touched and humbled by that little piece of gold; it also made him feel ashamed of himself. Finally, he asked, "Why? Everything I've worked for is gone. It's finished. It's dead."

O'Neil sat down across the table from him. He seemed puzzled for a moment before he asked, "Yeah? Is it?"

"Certainly it's dead! You and your force-field killed it all! When does a rocket blast off for the satellite any more? There are no rockets! You killed them!"

O'Neil waved him off. "Aw, you talk like I was a murderer! Rockets aren't living things; they're powerful, exciting gadgets, but they're too inefficient and you know it! I just saw a better way to do it and made it pay off. That's not important." He leaned forward over the table. "Henry, they landed on Ganymede yesterday."

"Not in a rocket!"

"No, but they landed, Henry. We've landed on Mars and Venus, and now we've walked on another world where we've never been before. Remember at White Sands when you had the picture of Tenzing Norkey at the top of Everest? You told me you were going to hang the picture of the first men on the Moon next to it, because both pictures showed men standing where nobody'd stood before and because both pictures would show that the human race could do everything it wanted to do. That gave me the first inkling of why people were fired-up about space travel, and I caught the bug from that. But you left the picture there at the Sands."

"I'd forgotten all about that,"

Enright admitted.

"You've forgotten more than that, Henry," O'Neil replied thoughtfully. "You were in rocketry then because you were all hot to be a space cadet and go to the Moon—just for the adventure and the sake of doing it. Everybody used to laugh at you—me included, at first. It was a dream then; we could do it, but there didn't seem to be any practical reason for doing it. But you pushed it anyway. Remember when we put the first manned job in orbit? You hollered 'Fire!' and I pushed the button. There was a fifty-fifty chance of the whole works blowing up on the launcher, but we got it up there with Peterson riding it. Whether you realized it or not, Henry, that was the turning point. Space travel bloomed overnight, because you proved your point and showed it could be done. It didn't make any difference then if it was impractical; it went ahead because you'd won the big battle."

"But I lost," Enright put in bitterly. "I lost to you. Engineers and scientists spent years, *decades*, to develop the rocket for space flight. It isn't right for a man like you . . . an amateur . . . to hit something on blind luck and make everything we've done worthless!"

O'Neil put his elbows on the rough table top and looked levelly at Enright. "Sure, I was an amateur, Henry. But I ain't the first amateur to do something the pros couldn't. Ever read anything about the history of science? Let's take aviation, for example. It runs a pretty close parallel to space travel. 'Way back in 1890, the lighter-than-air ships were the only things they had to fly with. But they were big, unreliable, expensive, inefficient, and hard to handle. A lot of people were working on flying machines on account of the disadvantages of the balloons. But nobody could make them work—except a couple of guys who built bicycles for a living. They were pure amateurs at flying. They did what the brains couldn't do: built a machine that used the air itself to keep it up there. Do you think that was luck?

"Henry, any jerk can win at craps—but it ain't luck, or accident of numbers, or the fact that somebody's gotta win that makes the Wright Brothers. Ever hear of Marconi and the amateur radio hams? How about Henry Ford? Einstein? Was it all dumb luck? How come they whipped the specialists? Could it be on account of mankind is where he is today because he's an *unspecialized* animal? It ain't dumb luck; it's a lot of things."

"So you're proud of being an amateur? Are you proud of having wrecked the lives and works of other men?" Enright shot at him. "Are you proud of it when you sit there and tell me one of your ships landed on Ganymede, knowing as you must

that the two of us could have done it with rockets, and knowing you wrecked my life to put that ship there?"

O'Neil sat back and smiled broadly for the first time. "You know, Henry, I haven't been able to understand your actions in the last two years. I guess it's always been natural to me to find a new line of work when the old job folded up, so I couldn't figure out why you got dumped so hard. Now I think I know why. You got a form of occupational disease, Henry, one that's common in the sciences. They've been hollering for specialization. You fell for it. At first, you were tooting the big horn for space travel; when you got space travel, you settled back to being the expert on rocket motors who got us out there. And you lost sight of your real goal. You got so you couldn't see any answer except the one you were trying to get.

"So, when rocketry collapsed from the big-time, you didn't try to apply your natural talents to the new field. Instead, you fought it. Remember the dirigibles, Henry? They were hot stuff until the airplane came along. Then the dirigible boys fought the simpler, cheaper, faster airplane right on down the line until the *Hindenberg* blew up. There ain't been a dirigible built since, but the smart dirigible boys still got jobs designing blimps to do things planes and copters won't do. Henry, rocketry ain't lost. Space travel will always need engineers who know hydraulics, high-pressure systems, thermo, combustion, and a lot of stuff associated with rocketry. We need boosters and jatos and auxiliary power plants. And we've got to use taxi rockets at the satellites because the force-field units are too big to put in the little ships. Henry, we've still got a lot of problems to solve."

"If you're trying to get me to come to work for *you*, the answer is no!" Enright growled. "If you used this medal to try to soften me up, you can have it back."

O'Neil took out a cigarette and offered one to Enright. When the engineer turned it down, O'Neil lit up and replied, "Believe me, Henry, the only reason I came was to give you that medal. I respect you as an expert and for what you did."

"What good did it all do me when the only thing I've got to show for it is a medal?" Enright complained.

O'Neil leaped to his feet and leaned over the table. His eyes blazed as he brought his big fist down. "Damn it, Henry, some people don't even get a medal—much less live to get a single honor! Quit being sorry for yourself! So there's someone turns out to be smarter than you are; so what? You've gotten so stubborn and small-minded that you missed the biggest point of all. You wanted to get to Mars with rockets. Well, to hell with the way to get there! The important thing is:

we did it! It was done! We got to Mars! And we're going to the stars! The method we use is not important! Can't you get that through your head?"

He sat down and snubbed out his cigarette. Catching his breath, he went on easily, "Come on in, Henry; the water's fine. There's still a lot of work to be done. There will always be work to be done. You've only got to see old Terra from twenty thousand miles out to know that what we've done was worth it, no matter how. The sight of a rocket taking off can't hold a candle to it. It gives you a feeling of . . . of— Well, why don't you find out for yourself?"

A month later, Henry Enright did find out for himself. It took him two weeks to decide to, and even when he boarded ship he had a little trouble suppressing the hatred for the ungraceful ships that he'd allowed to build up within him for years. It was all new to him, this force-field astrogation, and the distrust born of not understanding made him a little hesitant and nervous.

But later, as he gazed through the control-room ports of the *Venture IV* and saw the Earth as a small sphere set against the innumerable stars of the universe, he suddenly gained a new and sweeping perspective of the vastness of the Universe that mankind had set out to conquer. The sheer emotional impact of it humbled him, and yet exalted him in the knowledge that mankind had done this. The feeling certainly did surpass anything a rocket alone had stirred in him.

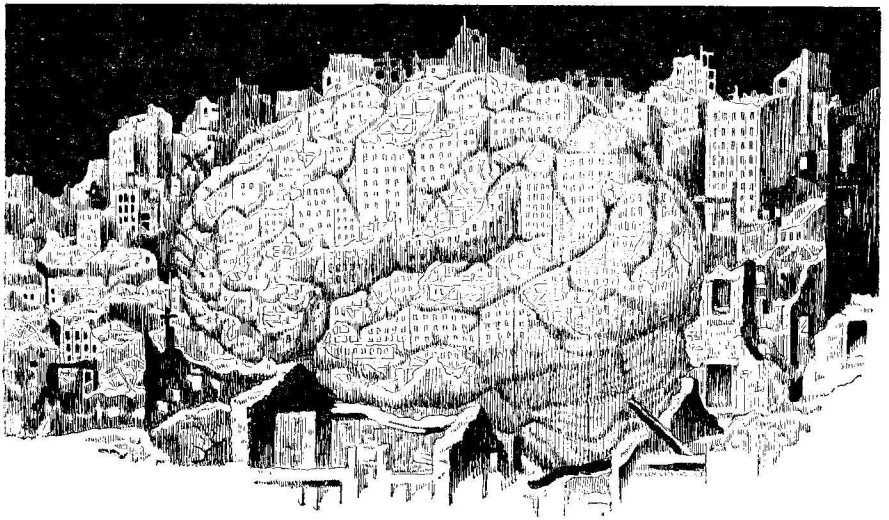
And in the face of the tremendous panorama before him, he saw how small and insignificant his troubles and hatreds had been. It was accompanied by that numbing sense of disgust and shame which comes when men see themselves as they were. He had been a weak and inadequate human being—but there would be time to start correcting that now.

But greatest of all was that satisfying, thrilling feeling that this was the sight he'd wanted to see for thirty years, that this was what he'd set out to do with his life, and that what was past didn't matter any more.

Bill O'Neil quietly pointed toward a pin point of light known to them both as Alpha Centauri.

Enright merely nodded. "Some day. But we've got to look around our own backyard first. And we've got some work to do, too. Right now, let's go see those canals."

THE END



THE GREATER THING

BY TOM GODWIN

***The Thing** in the City had an immense mass of knowledge, and the immense power that stems from vast knowledge. But—it lacked something which, because it was lacking, it could not know it lacked, until it engulfed the girl . . .*

Illustrated by Kelly Freas

The thing in the dead city was conceived the night the city died. It was created by chance, but unlike that first life on Earth, it was not mothered by the calm earth and water and fathered by the young sun. Its mother was the blasted, riven soil and the screaming winds of concussion, and its father was the fierce radiation of the shattered atomic pile.

It began somewhere under the ruins as a single-celled speck of protoplasm; insensate and without purpose, hardly more than a chemical change. But there was a difference—it grew. It grew, and the radiations hastened its

evolution, contracting millennia into days. As it grew it changed form in parts. Parts of it died, unsuited for survival, while the remainder grew stronger and more complex. It acquired the first beginnings of intelligence, and its intelligence became greater as its body became more complex. It developed extensions that crept along the subterranean ruins then explored upward into the sunlight. It expanded, its blobs and webs reaching outward; constantly evolving until it could change form at will, and parts of it could separate from the whole for a while, then merge again with it.

And it thought. At first its thoughts had been merely sensations; the awareness of itself, the will to live, the form of the shattered city. But as its physical body grew more complex, its thoughts became more complex. At last its blobs and webs reached throughout the city and it had attained physical maturity. It stopped growing and had nowhere to go and nothing to do—but think.

It constructed a multitude of eyes and other organs to examine its world. It studied, and learned, the laws of matter and energy. Its mind knew the secrets of the physical universe, but its great body knew only the city and it, alone, moved there.

It studied the skeletal remains of the beings who had built the city and learned their physical structure. It studied their records and learned their way of life, but it could not understand. It knew only absolute logic; the precisely predictable, unvarying reactions of physical things. It could not understand how the builders of the city had thought, nor why they had destroyed themselves, and it wondered. It did not care, for it was as devoid of emotion as the physical things it knew so well. It merely wondered, and waited for the day these beings might come to it and enable it to learn the reasons for their actions.

It waited patiently, for the problem was of only minor importance to it. It was fully aware of the power of the weapons that had destroyed the city, but it felt no fear of the coming of the beings who possessed these weapons. It knew that in its knowledge of physical forces it was invincible. It was neither vain nor proud, for such emotions do not spring from cold logic. It knew that it was invincible and, to it, the knowledge was no more than a commonplace fact.

It realized its tremendous powers for destruction or construction, but it had no motive for either. It had but two instincts: the will to live, and the curiosity without which its great intelligence would have remained an unused, and useless, potential.

It was fifteen years old when the first humans entered the city. It was telepathic and could read their thoughts but it could not comprehend the emotions that drove them. It learned that the first two were to die at the hands

of the others who followed and its interest increased. But it was content to remain unseen and merely observe; it had no reason to interfere.

The long ridge in the distance was sharp against the sunset's afterglow and Thorne waited, watching the saddle where their pursuers would cross—if they were as near as he feared.

A black dot appeared in the saddle, tiny but distinct against the sky. He focused his eyes on the spot until all else blurred, counting the dots as they appeared for a moment, then disappeared down the near side of the ridge. He counted nine, then the saddle was empty again.

He turned away, his face bleak and grim. Nine little black dots against the sky; nine sweating, eager State police closing in for the kill. But they had been too eager, they had betrayed their nearness by not waiting for darkness to conceal them as they crossed the ridge. They should have restrained their impatience for a few minutes, then taken up the trail. They were fools. In their eagerness they had delayed the moment when they could crowd in with the lean bloodhound straining at its leash and anticipation glistening in their eyes.

He hurried into the trees where the girl lay sleeping. She was lying as he had left her, the yellow hair tumbled about her shoulders and her breathing tired and slow.

He shook her shoulder. "Time to go, Lorrine—they're coming."

She came to her feet at once, her eyes wide-awake and alert. "How far?" she asked.

"Not over a mile. They must have followed all day without a break."

She brushed the leaves from her hair, trying to comb it with her fingers. The links of broken chain dangling from the manacles on her wrists tinkled metallicly. "Still only four of them?" she asked, then ceased trying to comb her hair as she read the answer in his face. "Nine?"

He nodded.

"Then . . . they've killed all the others, already. They didn't take any of them back alive."

"They never do—not escaped Underground prisoners," he answered shortly. "We can't help the others, now—and our turn is next. Let's go!"

She followed silently as he struck out through the shadowy woods. They came to an open field as darkness fell and a glow in the eastern sky heralded the rising of the full moon. He set as fast a pace as he dared, aware that the long day's march had told on the girl more than she would admit but with the certainty in his mind that her only chance for survival this one more night lay in forcing her tired legs to carry her on, lengthening the distance between themselves and the snuffling bloodhound for so long as they could.

They came to a creek as the moon lifted above the horizon, a creek run-

ning nearly at right angles to their own course. Its swift, shallow waters would erase their tracks and leave no scent for the hound and they splashed down it until it turned too far away from their own course.

The countryside began to change after they left the creek, the shells of houses appearing in the distance. They came to a road and followed it. It came to a junction with a highway and they followed the highway, their footsteps sharp and quick on the broken pavement. The houses became more closely grouped together as they walked on, and when the moon had climbed halfway to its zenith they came to the outskirts of the city; the first broken and fallen walls.

The girl's breath was coming hard, and she stumbled with increasing frequency as they hurried. He watched her without comment or softening of the bleak hardness of his face, but he called a halt when the first turn of the highway into the city hid them from the country behind. She dropped to the ground, her back against the concrete wall of the roofless shell beside the highway, the hard laboring of her lungs fast and desperate in the stillness.

"We'll rest a while," he said. "You've about reached your limit, and I think we may have lost them for a few hours by taking to that creek."

He moved out a little way from her, where he could watch back down the long ribbon of moonlit highway. It was clear, and he turned his attention to the short distance he could see into the city. Some of the buildings were almost untouched by the bombing, but there was no sign of any inhabitation; a thing to be expected with the population reduced to one third by the bacteriological warfare that had followed the bombing. The State found it best to concentrate the remaining population in the more industrially and agriculturally productive areas, both for greater production and for its more rigid control over them.

He unslung the police carbine and laid it across his knees, making sure once again that the extra clip of cartridges was still in his pocket. Two cartridges left in the magazine, five in the clip. Seven shots and nine police. A regulation rifle would have been better, with the vicious jut of its bayonet to rip at their guts when the rifle was empty, but beggars and Undergrounders can't be choosers. He had been lucky to get his hands on the carbine during the brief, wild turmoil of the escape.

The girl's hard breathing died away as they rested and she smiled at him with a rueful shake of her head. "That was quite a pace you set. Walking is supposed to be healthful; in our case most decidedly so. But how long can we keep on with this forever running?"

"Well—" He shrugged his shoulders. "We can run, or we can take the alternative."

She toyed with the chain on her wrist, staring unseeingly across the street. "Yes, we could take the alternative," she said. "The knife and the whip and the fist until they were satisfied we had told all we knew, and then the bullet. So—we keep running."

"You could have had safety and the benevolent regard of the State," he remarked, watching her curiously. "Only volunteers are in the Underground."

"Benevolent!" Her lip curled with distaste.

"How long have you been in the Underground?" he asked.

"Three years."

"Why did you join?"

"For the same reason you did, and everyone else—because humans should be more than helpless automatons obeying every whim of the State."

"What was your job in the Underground?" he asked.

"The State would say I was a propagandist—I prefer to think of myself as teacher of the truth. This was once a great, free nation where a man could cross it from east to west, north to south, without question or interference. It was *his* country, and he was proud of it. He was proud, not afraid. His home was his own, inviolable, and his family was his to care for and love. Children were taught to respect right and decency, and to hate oppression and cruelty. People were proud and free—not humble and afraid as they are now. And, above all, there was a mutual trust and kindness between people, not the suspicion of each other and the indifference that the State tries so hard to sow.

"Now, only the State is to be trusted or loved; the State is good and all else is evil. My job was to help show the lie of this, and to prove the lie of the State when it says that all was poverty and evil before the coming of the State; that only the great, benevolent State stands between the people and decadence and starvation. My job was to prove these lies *were* lies, and to show that people can be free again, to show them that no man has the right to dictate the lives of other men. And to show them that the State is not omnipotent; show them, and never let them forget, that the great all-powerful, all-wise State is one man, one scheming, bloated little ego-maniac. The older people know these things, but they don't dare speak. The younger ones can be shown and, when they see, all will have a unity of purpose. All will have a common goal, freedom. The State will fall before their unity and people can once again be more than obedient sheep."

Her eyes flashed with the intensity of her convictions and Thorne smiled faintly. She saw it and demanded challengingly, "Is it funny?"

Thorne continued to regard her with the faint, humorless smile. "Did you ever try to convince a herd of sheep that the only reason they were

being taken from pasture to pasture was to condition them for the slaughter?"

"People aren't sheep!" she retorted. "People are as fine as they ever were. The older ones know, but they don't dare speak or the State will hear. The younger ones are the same, at heart—they don't know, they've never had the chance to know, but they will believe when they're shown."

"So we of the Underground devote our lives to trying to show them until one of them informs the police, and wins the little gilded 'Loyal Citizen' medal."

"You're judging them all by the few rats among them," she said coldly. "And the others—do you think they *want* those medals? When the lives of a man's family are at stake he *has* to talk. He doesn't want to—he doesn't want to tell the police what he knows of the Underground—but the life of one Undergrounder can't balance against the lives of his family. So he has to tell what he knows, and he has to take the gilded medal. And he hates the thing—it's a badge of dishonor in the eyes of all but the State. He wants to throw it back in their faces and kill them. But he can't; he has to take it and let the shame and guilt of what he's done be with him the rest of his life."

"I know," he answered, no longer smiling. "Some of them have no choice. I joined the Underground for the same reason you did, but a long time before you did. I felt as you do, at first, but as the years go by and we make so little progress against the State—well, it takes the fine edge off your hopes."

"We're making progress," she insisted. "We can't expect to undo in a few years what was so long in the making. The last war was only the culmination of the leader's plans that they had laid years before. It gave them the complete emergency powers they needed to make our country into a State. They got a head start on us, but we'll become stronger as time goes by."

"I hope so," he said, without conviction. "When I joined the Underground I believed as you do; I believed that people should, and could, be free. I hated the State and I believed that the people could be awakened to its murderous rottenness. Now, I'm not so sure about awakening the people, but I hate the State more than ever."

"The people know what the State is—all the older ones and most of the younger ones. But they're afraid to speak against it, yet; the penalty is death for such treason against the State. And, if they escape to the Underground, the penalty will be inflicted on their families. But the State can't stamp out their wish to be friends with all others—it can't replace human sympathy and understanding with nothing but suspicion and distrust for each other. The human heart

wasn't made to hold only hate—it was made to hold kindness and understanding for others, and all the guns and whips in the State can't change it. And, in the end, this will be what unites the people and the State will fall."

Thorne smiled at her again, gently, as one might smile at a child. Her faith was her own, and not his to discourage. "Perhaps you're right," he said. "I hope so. And now—rest as best you can. We'll go on after a little while and we'll find some way to lose them before the night is over."

He looked again up the road, listening and watching for the tiny black dots that would eventually come. It was silent and clear, so far as he could see, and he turned back to the girl, conscious of her stare. She had not relaxed, but was sitting straight against the wall, watching him. She was toying with the chain on her wrist again, her jingling of it reflecting the troubled uncertainty on her face.

"You'd better rest while you can," he advised again.

"There's something I have to know, first," she said. "And a promise I want you to make. Do you *really* think we'll be able to lose them tonight?"

"I think so," he lied without hesitation.

"I think you're a liar," she replied calmly. "It's a good, white lie, but it's a lie. I've had a feeling all day that something was going to happen, and it keeps growing stronger. And I think you have, too . . . I think you're as sure as I am that this will be the last lap of our little race."

"Maybe so . . . maybe not," he answered. "We can only try, and take what comes."

"I know," she said. "I'm not crying or feeling sorry for myself. I knew, when I joined the Underground, that it might end like this. But this feeling keeps getting stronger and there's this promise I want you to make. I'm not afraid to die; not yet, anyway, and I don't think I'll be afraid when the end comes."

In the face of her seriousness Thorne found he did not have the heart to belittle her fears with the hollow bluff of false optimism. And, despite her words, it seemed to him she was just a little frightened. A verse from Omar came to his mind, unbidden, from where it had lain forgotten so long:

And when the Angel of the darker Drink
At last shall find you by the river-brink
And, offering his Cup, invite your Soul
Forth to your Lips to quaff—you shall not shrink.

"We won't be the first, nor the last, to die for what we think is right," she went on, "and I don't regret the kind of life I chose. I don't *want* to die, but I'm not afraid. And I know that others will carry on our work—I know my faith in people is true, that the good in people can never be destroyed. Only"—she paused as though search-

ing for the right words—"there are different ways to die, and I don't want to die the police way. And there's an alternative to the alternative."

"I know."

"It would be better, wouldn't it?" she asked, her eyes on his. "You would rather take it, yourself, wouldn't you?"

"I suppose so. It would be better than the other."

"Then I want you to promise me, when you see it's really the end, that you won't let them get me."

He could take his own life as the least unpleasant of two unpleasant choices. It would be cruel and illogical to not do the same for her, but the thought of deliberately taking her life was painfully disturbing to contemplate.

"Will you promise?" she asked again.

"Of course," he said, keeping his voice flat and impersonal. "But they haven't got us yet."

"Of course not!" She smiled up at his bleakness. "I only wanted your promise because I have that feeling. It's a bridge we haven't reached yet—maybe it won't be there."

"Bridges should never be crossed until you get to them," he said. "One of the best ways to keep that bridge from being there is for you to rest while you can."

She obeyed meekly, drawing her knees up close and pillowing her fore-

head on her crossed forearms. He watched her a moment, knowing that she was only pretending to be almost asleep but satisfied that she was relaxed with the burden of the way of her dying lifted from her mind.

He searched the road once more, and found it empty. He looked again into the city but it was as still as ever, with the moonlight whitewashing its deserted streets. A two-story building stood across the street from him, with a yawning blackness where the show window of the first floor had been. The glass remained in the two windows of the second floor, giving them the appearance of two eyes staring blankly above a gaping mouth. Part of the sign over the show window was visible: . . GR . . . . T . . . .

It was not enough to give a clue as to the name of the city, and he doubted that knowing the name would help any. This was a section of country far removed from the centers of population, and unknown to him. And it was only a dead city, with nothing to offer them, despite his words to Lorrine. They could hide in the city, but for how long? Even if, by some miracle, they eluded the police until morning it would gain them no more than another day's respite, then the helicopter patrol would appear on the scene. In this land of open plains they could not escape both the bloodhound behind and the eyes watching from the air above. There could be only one way for it to end—

His thought broke as he saw something gray and shapeless move in the darkness behind the empty show window. It was there for a moment, long enough for the carbine to come to his shoulder and the sights to catch it, then it was gone. He held his breath and waited, his finger on the trigger, but there was nothing more to see other than the empty blackness under the staring, glassy eyes of the windows; nothing to hear but the soft sound of his own heart, the breathing of Lorrine and, from a long way off, the sleepy chirping of a bird.

He lowered the rifle and glanced at Lorrine. She was in the same position as before and had not seen him move. Nerves, he thought. Nerves and imagination. Or a puff of wind had stirred the dust in the old building—but there was no wind.

He watched the blackness again, listening. Nothing moved there but, as he listened, he heard another sound. It was the sound he had known he would hear too soon, coming from far back along the road and carrying faintly through the night air—the sound of human voices.

It was content to remain unseen and merely observe; it had no reason to interfere and it had no desire to serve as the catalysis that might deflect the human reactions from their norm. Its curiosity was as great as its intelligence and it found, in the thoughts and behavior of the humans, a problem more

intricate than any it had ever encountered. It read their minds and tried to analyze what it found there, correlating the data with all its vast intelligence. It found that correlation was impossible, that the two humans were motivated by incomprehensible nonphysical things; many different things which seemed to stem from one basic human characteristic.

Into its analysis of the problem went all its tremendous wisdom, but it could find no solution. *Something* motivated the humans, driving them on to do illogical things that would result in their deaths, but the motivating force was nonphysical. It was a human characteristic, intangible and nonmaterial, and the thing in the city could not define it. It was a factor vital to its solution of the problem, but it was as impalpable as smoke.

So it continued to observe as the two humans resumed their flight into the city, waiting for their further actions to reveal the missing factor of the analysis. And it would, before long, observe another reaction it had never observed before—it had never watched a living thing die.

Thorne turned to the girl, reluctant to arouse her and lead her again in the futile flight, but there was no choice.

"Lorrine."

She raised her head with the alertness of the hunted animal. "They're coming," she said, not making it a question.

"Too far away to see them in the moonlight, but I heard their voices. Keep to the shadows until we get farther in the city."

The street curved, hiding the road behind them, and they walked down the center of it, away from the broken masonry that littered the walks. Their course was erratic, zigzagging at random but drawing nearer the heart of the city. At times they walked down streets almost untouched, their footsteps echoing loudly from the walls, while other sections were littered with heaps of rubble which they climbed over. Occasionally a section was so completely destroyed that they were forced to detour whole blocks.

They came to another section almost untouched, where the street ran east as far as they could see. It would do as well as any, Thorne decided, and Lorrine wouldn't be able to take much more of the climbing over the bombed areas. There was still no plan, other than the aimless fleeing, and this clean street would have as much to offer them in the way of a miracle as any other. He had hoped that they might find something, anything, which might offer them a chance for survival, but there was nothing but the empty, dead streets and the cold, blank stare of the dark doorways.

If he could know where they were and what lay beyond—but the street signs gave no clue. ELM 34—CENTRAL ROAD 265—NO LEFT TURNS.

They passed what had been a bank. An inclosure inside, with six steel-grated windows, faced the front. The street window was broken but one section, larger than the others, was lying on the walk. The dim gold lettering was still visible: GREEN CIT— FIR— NA-IO.

Green City. He remembered the name vaguely. Too far from the centers of population to be of any value to the State. One of the first cities bombed—center of atomic research work. He had seen a map of it once, at Underground headquarters. A topographic map which he had glanced at and laid aside.

As they walked on he tried to recall the features of the map. It had meant nothing to him at the time, but something about the map kept gnawing at the back of his mind. There was something the map had shown in the city—or was it beyond the city? The thing stirred deep in his memory and demanded to be recognized. It had not interested him at the time, but it was something of vital importance, now.

He tried to visualize the map. It had been white, with brown for the topographic lines and black for the roads. And blue—that was it—*blue!* A small river east of the city—at the very eastern edge of the city. A river, and freedom!

"Lorrine!" There was almost jubilance in his voice. "I know now where we are. There's a river just beyond the city—it will take us away. We can use something for a raft, anything that will float. They can't float down the river any faster than we can, and we'll have a head start on them. And they'll never know where we left the river."

Some of the weariness left her at the words and she laughed, the moonlight bright on her upturned face. "Maybe I did try to cross a bridge too soon. I think a raft would be much better. Maybe this feeling I have is silly imagination, and we can laugh about it, tomorrow."

The river was east of the city and they followed the street they were on. Its canyon stretched straight and clean before them, the moon shining down its length. The blocks fell behind them until it angled to the right and another took its place, the full moon still straight before them. There was a street sign at the junction and it read: RIVERSIDE DRIVE.

"Riverside Drive—it can't be far, now," he said. "It won't be long until we can be on our way down the river and Harker and his little army will find the trail comes to a dead end at the river's bank."

"This will set him back, if we escape," Lorrine observed. "It takes the capture of a lot of Undergrounders to win a promotion, but the loss of only two can set a Section Supervisor back to a one-stripe Squad Leader."

"No, the State doesn't let incompetence go unpunished," he said.

"But, to get to be Section Supervisor, Harker must have been an exceptionally thorough butcher up till now. I was never in his section before . . . do you know anything about him?"

Her answer was like a vicious, unexpected blow to the stomach.

"It seems he made a name for himself when he was in the Helicopter Scouts."

He kept his face expressionless, not letting her see the effect of her words. The Helicopter Scouts—they were a roving patrol, unattached to any section. As a former Scout, Harker would have known of the river and conjectured that it would be their objective. While he and Lorrine wandered through the city and his memory lay dormant Harker would have planned, and carried out his plans. While they zigzagged through the city in their attempt to elude him he would have sent a detachment straight through to the river. There they would wait—or were waiting now—while the others came in behind, the bloodhound sniffing along the trail.

They were trapped.

But there was no need to tell Lorrine; perhaps he was wrong in his dark surmise, and perhaps Lorrine was wrong in her premonition. Perhaps.

They came to a corner where the show window was still intact, and the moon shone full on the dusty goods inside. Lorrine glanced briefly back the way they had come, as he stopped to scan it as thoroughly as possible in the moonlight, then she shaded the glass with her hands and stared into the store.

"It was a toy shop," she said, as they walked on. "It must have been just before Christmas; there was a star there—the Star of Bethlehem."

A dusty tinsel star—peace on Earth and good will to all men. A pathetic little symbol, outlawed by the State, still shining dimly in a dead and silent city.

"It was a beautiful symbol," she said, when he made no answer.

"Yes, it was." He unconsciously accented the last word.

"It *is*," she said. "It will always be. People have followed that star for two thousand years—how many tyrants and States have died and been forgotten in that time?"

He did not answer, his eyes darting down the cross streets as they crossed another intersection. The city was brilliant with the moonlight, but for the inky shadows on the moonward side of the cross streets. It seemed to him he had never seen the moon so bright; it washed the street with bright silver and paled only a little the gold of Lorrine's hair. It glinted along the barrel of his rifle and threw white lances of light from the fragments of glass on the walk. All was light and brilliance where they walked, but the river was straight ahead, and so was the moon. They could only walk on and chance the cross street shadows where, if anywhere short of the river, Harker's

men would be waiting for them.

When the intersection was behind them Lorrine spoke again. "Were you an orphan?" she asked.

"My father died when I was three and my mother died a year later. Why do you ask?"

"I thought so—I've seen others who never had any families. Did you stay in an orphan's home until after the war?"

"Yes."

"And then the State put you in a State Home. How old were you, then?"

"Nine. I ran away when I was fifteen. Why do you ask?"

"Because I've seen others like you, with the same hardness. In the Homes they learn only discipline and dogma. They can't know what the love of a mother is like, or even friendship. They either learn to obey, or they learn to hate."

"Yes." He smiled thinly. "It was there that I learned to hate them. When I was fifteen I knew what I wanted to do."

"And what was that?" she asked.

"Destroy them—all of them."

"You told me that, at first, you believed as I do," she reminded him.

"So I did. When I ran away the Underground took me in and there was an old man there, old even then, who seemed to take a special interest in me. He believed as you do, and I believed as he did. He insisted that I read—all the old books the State forbids, now. He was an idealist and I believed in his ideals in the years I knew him. He was an idealist and a dreamer, but he was a fine old man. The police got him the year I was twenty."

"And you hated them all the more, then?"

"Of course. All his kindness and faith in the goodness of people meant nothing to the rat who identified him to the police. That was when I began to lose my own faith."

"Then you've never had but one friend?" she asked. "If you had had the chance to know the love of a family, to see the things people will do—the *good* things—for those they love, the sacrifices they will make, you wouldn't feel as you do."

"Hate or idealism—the goal is the same," he said. "Destroy the State."

"But it isn't the same, to do something because you believe in it and to do it because you want to destroy something you hate."

"The goal is the same," he repeated. "And if, by some miracle, we should ever succeed, my satisfaction at the destruction of the State will be just as great as your joy at the freeing of your sheep."

"No." She shook her head. "It isn't the same, Johnny."

Johnny—the old man had called him Johnny. How many years, now, had he been John Thorne? Or just Thorne? Odd how the addition of two

letters could change it from just a name to something close and friendly.

"And, but for the old man, you've never had anyone who cared for you, or anyone you cared for?" she asked, with a gentleness to her voice that made it more a statement than a question.

There was a sympathy and understanding of him in her words that touched too close to the thing he wanted to keep hidden from her, and his answer was brittle and almost defiant. "No—I prefer it that way."

She turned her eyes to the street before her, not letting him see it if the shortness of his reply had hurt her. He felt the quick stab of contrition and added, less harshly, "This is no time to argue, anyway."

"No," she said, looking up at him again. "Let's not argue—not now. Let's talk about all the things we'll do when we're free, all the wonderful things that we will do."

She talked to him, then, as they walked along; little familiar things of herself and her childhood, her hopes and plans for the future. The little things, close to the heart, which two who face a common danger will reveal to each other. And, though nothing she said disclosed it, it seemed to him that her words covered the dark undercurrent of her premonition; that she was still afraid, and her talk of their freedom to come was only a whistling in the dark.

Troubled by the new emotion that had grown so swiftly in the past day and night, he lapsed into a taciturn silence. He had always believed that there was only one way a man could go through life with no heartaches, and that was to never let anyone be near or dear. Perhaps there had been a time when a man could give way to the yearning for friendship or love, but the life of the Underground was too uncertain. It was a grim game, and sentiment had no part in it. The weak and sentimental could have the brief happiness of friendship and love; let them have it, clutching it to them, then weeping when it was snatched away. He would take the high, lone road where there was neither love nor happiness—nor regret. So he had believed.

But now, as Lorrine talked to him, it seemed he had never realized just how high and lonely his road had been. She had broken through the armor which had protected him so long, which had warded off the friendship and love that led to regret. She had done so without trying, with only the courage of her smile and the warmness of her heart. She was inside his armor and he felt that he would like to tell her she was there, and ask her to never leave. It was a weakness he had always been contemptuous of in others, and he cursed it now in himself. It was for others, for the weaklings, not for him. If Harker's men were waiting by the river, a display of sentiment would not affect their fate. It would not be

necessary to precede the end with fond and tearful farewells. She was inside his armor and, somehow, he could not remove her, but it would gain neither of them to tell her she was there.

As they walked on she hesitated before the rebuff of his dark silence, then said no more. He ignored the questioning, uncertain look in her eyes and made no comment when her voice trailed away.

The buildings became farther apart, and residential in structure. The lawns were shaggy with grass and the hedges were grown into thick masses and barriers. A breeze drifted toward them, carrying the unmistakable fresh, damp smell of the river.

His thoughts began their vain circling again. Freedom—if Harker's men were not there. But for how long? And for what? Only to try once more to arouse the spirit of the frightened sheep. To hide, and slink through the night. And watch—always and forever watch, for the police have a thousand eyes. It was a task without reward, without gratitude, with only the satisfaction of destroying a little of something you hate.

He envied Lorrine her idealism, her faith in the goodness of humanity, and he wished he could regain the idealism he, himself, had had at the beginning. The Underground had been a Cause, then, flaming and noble. They, the Undergrounders, had been the sword that would free men from their bondage. They had been the Nathan Hales, they had been St. George against the dragon—they had been, he thought with bitter savagery, Don Quixote against the windmills.

Yet, perhaps Lorrine was right. There was goodness in men—they were helpless and afraid. A man will reveal the identity of a traitor to the State when the lives of himself and his family are at stake. Mothers still loved their children as they always had, and their tears were hot with mingled grief and hate when the State took them at the age of six.

But if the Underground was to ever succeed it would have to be soon. The children who would grow up in the State Homes would be subjected from earliest recollection to the dogma that the State is supreme, all-wise and all-powerful; that the State, alone, is fitted to direct the lives of men, that it is their protector, and that without it all would be chaos and evil.

To teach them differently would be to batter against the stone wall of their State-formed convictions that the State is good and omnipotent, that anything which would refute that is something wicked and dangerous, something to be destroyed.

But that would be in the years to come. Now there were only part of them who did not understand—and the others were afraid.

He thought again of Lorrine's idealism, feeling a sense of something lost; something he could never regain. If

this was their night, if Harker's men were waiting by the river, Lorrine would face it with her faith undimmed while he would have only the grim humor of having cheated the State to allay the mockery of the futility.

They walked on another block, two blocks, three blocks, then the trees loomed before them and there, its ripples flashing in the moonlight, was the river.

"It's really there!" Lorrine's smile flashed up at him and her hand tugged at his arm. "I was afraid to hope—but we did it! Let's go—let's hurry before this turns out to be too good to be true."

The weariness was gone from her in the excitement of her renewed hope and she tried to hurry him on, as though the river might vanish in a moment and they would again face the dark end of her presentiment.

"Wait," he said, seeing already the crushing of her hope and feeling the pain of it. "Listen."

She stood motionless with her hand on his arm, holding her breath as he held his. The river gurgled past its concrete walls and the breeze coming up the river carried the river's freshness and the smell of the trees. As they listened the breeze brought to them the sound he had expected: the murmur of voices.

Lorrine's fingers dug into his arm and she said, almost inaudibly, "Oh!" Then her fingers relaxed and she smiled again, only a little of the tightness in her throat as she said, "I guess it *was* too good to be true."

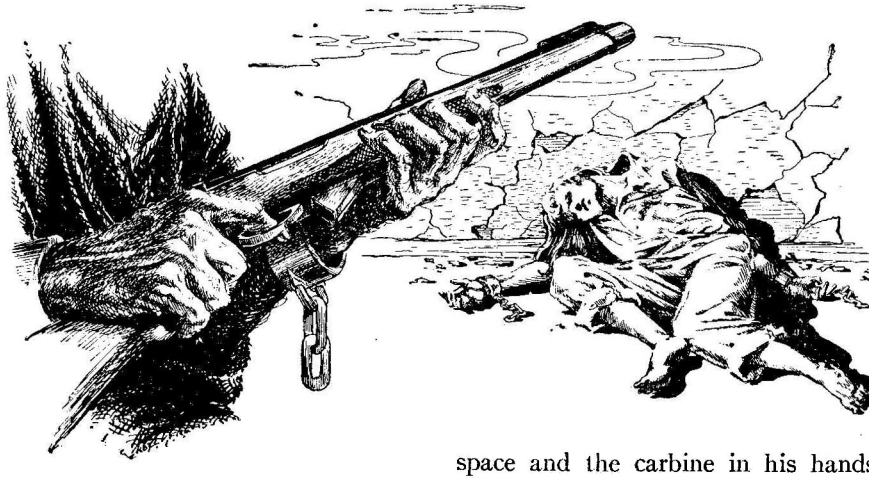
They came in sight as Thorne watched down the river, walking with slow assurance. Two of them. One of them fired three quick shots in the air and a rifle answered from somewhere up the river. He looked back up the street they had come down and saw the distant figures closing in behind them.

They were surrounded—Harker had planned well and there would be no escape. His men were coming with caution, but with deliberate confidence. They would want to take their quarry alive if they could. There were questions to be asked, and there were ways of getting the answers—the knife and the whip and the fist.

Thorne looked about him. The small stone house nearest them would do as well as any and they walked toward it, not hurrying. There was no longer any need to hurry.

The heavy door still swung on its hinges. He pushed it open and stepped through, the carbine held before him. Moonlight poured through the broad, high windows, flooding the room with silver. The farther side was in darkness and he again had the impression that, for just a moment, something gray and shapeless moved there. It was gone before he could be sure.

There was a small iron bar to secure the door from the inside. He heard Lorrine click it in place while he ex-



amined the room. It was square and devoid of any object but for a small grille in the floor near the farther wall; a conduit leading to some central heating unit, perhaps. It was too small to offer them any hope of escape.

There was another door opposite the one they had entered by, and he made sure it was barred. The screws holding it were red and misshapen with rust; that would be the door by which the police would break into the room.

One of the windows commanded a view of the river and he waited by it, watching. Lorrine walked softly across the room, to stop by the moonlit wall and wait as silently as he. He kept his eyes on the shadows under the trees, the rifle nestled to his cheek, the knowledge of what she waited for cold and sharp within him.

A figure darted across a moonlit space and the carbine in his hands roared twice. The figure ran on, to disappear in another group of trees. He took the other clip from his pocket and shoved it in the carbine. Five shots—count three.

Lorrine was watching him, her back against the moon-silvered wall. "Count three, Johnny. Remember your promise."

He turned back to the window without answering. He would remember, and there was nothing to say. He watched the shadows along the river again, the rifle ready. The river still tossed the moonbeams from its ripples and he could see the swift roll of its current. It would have carried them to safety but they had come too late. They had hurried to it, seeking escape from the death behind, but death had hurried faster. The lines of the verse came back to him—

And when the Angel of the darker Drink
At last shall find you by the river-brink—

It had found them.

He snapped a shot at another fleeting shadow, silently cursing the misaligned sights as the figure staggered, then ran on. Four shots—count two.

Something heavy, a battering ram, struck the door with the rusted bar. It creaked and a screw head snapped off, to fly across the room. He fired twice through the door, suddenly sick and weary to his soul and wanting to do what he would have to do, wanting to get it over with.

There was a cry of pain from behind the door and a sound of retreating footsteps. He heard them stop at a distance and speak softly among themselves.

And he had two cartridges left. Their impotent stand was over, their little flare of resistance had come to its end. He turned to Lorrine.

"I guess this is it," he said slowly. "This is where you and I get off. I'm sorry . . . I wish—"

He stopped. What did he wish? What does a man wish when he loves a girl with golden hair and he stands before her with the black muzzle of a rifle at her heart? What does he say when she stands as he had known she would stand, with her head back and the golden hair about her shoulders, with the light in her eyes and the radiance about her? What can he say in the last fleeting moments?

"Don't be sorry, Johnny," she said, the tightness no longer in her throat.

The battering ram struck the door and it bulged inward. They would break through the next time. He raised the rifle.

"Don't be sorry," she said again, "and good-by, Johnny."

He aimed at the spot where her heart would be fluttering—

The battering ram crashed into the door and he pressed the trigger.

The rifle roared savagely and she stiffened for the briefest moment against the wall, then fell to her knees. She tried to say something, but blood welled from her mouth and choked her. He saw where the bullet had struck her—high, too high. She would die, but with her own blood choking in her throat.

He raised the rifle again, his mind a red flare of impotent rage and regret, then the police were upon him. A rifle butt struck the base of his skull and he felt himself fall to the floor, the darkness of unconsciousness descending upon him. He fought against it and was dimly aware of a voice saying, "She dead?" And the answer, "Dying. Let's go—Harker's waiting." Then the darkness engulfed him and he knew no more.

It had never watched a living thing die, but its own logic told it that avoidance of death should be the strongest of all desires. It knew Lorrine's thoughts as she waited for death, standing against the wall, and it knew her thoughts as the bullet tore through

her and she fell to the floor. It knew her thoughts and it knew she was dying with the thing that had led her to her death, the intangible thing that had motivated her, still strong and undiminished within her.

Even in her dying she revealed nothing that could enable it to understand the reasons for her actions, to find the unknown factor, and its curiosity increased. It had tried with all its logic to understand, and it had failed. Perhaps it was something about her body or mind—something within her that it did not suspect.

The police tramped away with their captive and she was left lying on the floor. It went to her as she died, not caring that she died but eager to find the missing factor; the intangible thing that had impelled her to give up her life for others.

Its abilities were great and it could, without destruction of tissue, reach into every cell of her body. It did so as she died, and it knew every thought she had ever had, every memory, every emotion. In that moment of her death it reproduced within itself her ego.

When it did so it found the missing factor and it understood, at last, why it had been unable to analyze it; why its own mind, alone, could never have analyzed it.

The missing factor was a purpose, and a wisdom that had grown with that purpose for two billion years. It was a field of learning so different to its own learning, covering a period of time so inconceivably long, that its vast intelligence reeled before the magnitude of it.

When it reproduced her ego within itself it reproduced her emotions and motivations and it *understood.* With the understanding came, for a little while, near-insanity.

Thorne was first aware of the ropes that bound him to the concrete pillar, cutting into his wrists as his weight sagged forward against them. His head cleared and he opened his eyes, then shifted his bound hands behind the pillar until he could stand straight.

He had been taken back up the street, the same street he and Lorrine had followed. He recognized a corner toward the river—the toy shop.

The police were squatting before him, the anticipation stark and naked on their faces. One of them laughed and said, "He's back with us!"

"Why don't Harker show up?" another asked querulously. "Why did we have to drag this guy up the street for? Harker ain't crippled so he can't walk, is he?"

The first one stared at him speculatively. "You ever let Harker hear you say something like that and *you* will be!"

"He's inside that old hotel across the street," another volunteered. "He's got the walkie-talkie in there, holdin' a big confab with field headquarters. I hear the helicopters spotted some-

thing suspicious back the way we come and I think we're gonna have to hotfoot it over there."

"Yeah?" It was the querulous one. "How far?"

"Almost all the way."

"So we walk and Harker takes it easy until a helicopter shows up for *him!*"

"You mean we won't get to see the show?" There was scowling disappointment on the first one's face. "It ought to be good—Harker's madder than I ever saw him. It ought to really be good!"

"When Harker makes 'em holler, he makes 'em holler good and loud," another one observed, staring at Thorne curiously. "Yes sir, good and loud!"

Thorne's lip curled with his contempt for them and the first one stood up, to smile and very deliberately smash his fist into Thorne's mouth.

"I wouldn't do that," advised one. "You know Harker wants 'em in good shape when he starts in on 'em."

Thorne spat the blood from his mouth and the striker stepped sullenly back. Another of them appeared with an armload of broken boards. He piled them a few feet in front of Thorne and laid a blackened knife beside them.

"No use gettin' in a hurry, Jack," one said. "If Squint is right, we won't be here to see it—we'll be pluggin' back the way we come."

"You mean that we have to *walk* it again?" the one called Jack demanded.

"We walk, and that—"

"Here he comes now!" another interjected tensely.

Thorne watched the approaching Harker as he crossed the street. The police stood respectfully aside and he strode through with arrogant disdain. He stopped before Thorne, thick and stocky, his feet wide apart and the small eyes glittering in his heavy face.

"So you're John Thorne?" he said. "And the woman was Lorrine Calvert?"

Thorne said nothing and Harker smiled. "I'm not asking you, I'm telling you. When I get ready to ask some questions I have—you'll answer. And it might help you to know that none of the others escaped. You would be surprised at what we learned from them. But every little bit of information helps, and you might be able to add something. I'm sure you'll try."

He laughed softly at his joke and the police joined in, eager to show their appreciation of it. He turned to them, his tone curtly authoritative. "I can take care of this without any help. Get on back the way we came, and don't stop to pick any daisies on the way. I want you all at that lone mountain by daylight. I'll be there then in a helicopter to tell you where to go. Get going!"

They hurried away, all their resentment hidden by their fear of him, and he turned back to Thorne.

"You gave us quite a chase, Thorne,"

he said. "And I understand you killed the woman, yourself. That was a touching bit of melodrama."

Melodrama—waiting for the bullet with all her faith and courage burning the brighter—Don't be sorry, Johnny —Dying alone on the cold, gray floor —Don't be sorry—

Harker's hand struck him viciously across the face.

"When I talk, rats listen!" he snarled, his face flushed with sudden anger. "Did you hear what I said?"

"No." Thorne made his answer insolent in its disinterest.

"You—" Harker struck him again, harder, and stepped back, breathing heavily. He swallowed, and the hate stood out in livid outline on his face. He swallowed again, but when he spoke his voice was normal in pitch but for a thick undernote of fury.

"Your noble little wench is dead. Don't let it grieve you too much—I think I can take your mind off your sorrow. And, while you were playing the hero, you should have thought of yourself, too. Or did you lose your nerve?"

"Your dogs were too fast for me, Harker."

"A rat never stands a chance against a dog," Harker returned.

"I'm sorry I called them dogs," Thorne said evenly. "I apologize to all dogs for that."

Harker's hand lifted, then fell to his side. "This is a pleasant little exchange, I'm sure, but not quite informative enough." He smiled almost sweetly. "Shall we remedy that?"

He dropped to one knee and touched a match to the pile of kindling. It began to burn, snapping and crackling, and he thrust the long, black blade of the knife into the fire.

"Yes," he went on amiably as he straightened again, "this will be a chummy little party. Just the two of us, standing by the warm fire and talking. There seems to be something about the cheery warmth of a fire that induces conversation The friendly flicker of the flames, the ruddy glow of the hot steel—they seem to destroy a man's reticence."

Thorne pressed his back hard against the pillar and felt a slight loosening of the rope that bound his hands together behind it. Harker was in front of him, and could not see the movements of his hands. He began the slow, painful effort to work his right hand free, the rough rope cutting into the skin as he strained against it.

It might take an hour, with his movements kept hidden from Harker, and he would have minutes. But he would have to try—

"I'm a man with ambition, Thorne," Harker said. "I've come up a long way in the State, but I have my eye on the top—on the very top step of the ladder. I know where I want to go, and I know how to get there. It won't be too many years from now until Leader Stettnor is going to find himself toppled from his perch—by me. To do

that, I have to have more than ambition; I have to have a record of loyalty to the State and a record of efficient accomplishment. You're going to help me in that, Thorne—you're going to help me add to my record as an irresistible destroyer of the Underground. You're going to *talk*, and what you are going to tell me, added to what the others told me, will give me enough to make a clean sweep of the Underground in my section. And that will cause the State to promote me another step up the ladder."

Harker kicked more wood on the fire and it blazed up, reddening his face and paling the moonlight. Thorne felt the rope cut deeper as it reached the largest part of his hand, but it was still moving.

"I want to know all you know about the Underground," Harker said. "I want names, places, dates, plans. I want to know all you've ever done, and all that you intended to do. I want to know everything that you know. *Everything*—do you understand?"

The rope was cutting like the grip of a vice, but it was almost off. He strained at it with all the strength of his forearms.

"I know what you want, Harker," he said. "But sometimes a man gets disappointed. Do you remember that old proverb: He who lives by the sword—? You've climbed a long way on the bodies of men and women, and even children, who had the guts to try to stand up against your State. How many have you cut and burned with that knife until they were mindless?"

Harker laughed and took the knife from the fire, smiling at the glowing point of it. "It's nothing for you to worry about; you'll only be one more, and there will be others after you. Call this my sword if you want to, and say that I live by it. I have—I've *lived*, where the likes of you existed from day to day. And I'll live all the merrier when it cuts a way for me to the top step."

Harker stepped forward and Thorne felt the heat of the blade. "A red hot blade is a powerful thing—for the hand that holds it," Harker said. "And it's my hand that holds it. You're going to start talking now, and you're going to see how efficient a hot blade can be, for the hand who holds it. And it will hurt, Thorne—it will hurt like hell."

The glowing point touched him as he jerked free of the rope, with the burn of torn skin. His hands whipped forward and caught the knife from Harker's hand, bending down his wrist with a cracking of bone. Harker screamed a curse and snatched at his holstered revolver, awkwardly, with his left hand. Thorne slashed down with the still glowing blade, through the leather of the gun belt, through cloth and flesh, driving the knife deep in and through the thick paunch.

The holstered revolver clattered to

the pavement and Harker dropped to his knees, his arms hugged about his stomach, moaning and gibbering. Thorne cut the ropes that bound his legs to the pillar and picked up the revolver. He stared down at Harker and watched him wilt, still moaning, until he was half sitting, half lying, on the ground. All the arrogance had left him, all the domineering cruelty was gone from his face. He looked up at Thorne, sweat standing out on his ashen face and only fear showing in it.

"I'm dying—you killed me!" He mouthed the words with numb and terrified accusation. "I'm going to *die!*"

Thorne's smile was like a thin sliver of frosted steel. "It was pleasant to watch the others die, wasn't it? But it's different when it's yourself—and the cut of a hot blade hurts, doesn't it? It hurts like hell, doesn't it?"

"I . . . I—" Harker tried to speak, then his eyes widened as he looked through and beyond Thorne, seeing something that was utter horror. He shuddered convulsively and sank limply to the pavement. His throat rattled harshly, once, then he was still.

Thorne looked down at the silent, shapeless thing that had been Harker. Sometimes there was a little justice in the world—Harker had surely died by his sword.

He turned away and started back toward the river. The brief, brittle satisfaction was over. Harker had died —he had killed him as he had wanted to do—but it could not fill the empty years before him. He would return to the river and go back to the old, hopeless life; live out the empty years ahead.

The empty years—They had been empty before, but he had not known how empty until a slender, courageous girl had filled a day and night of them with her warmth. Now, they would be all the lonelier for her brief presence.

The moon was high overhead, and the room where she lay would no longer be flooded with its light. She would be lying there in the darkness, with the light gone from her eyes, and he should go to her. He should brush the golden hair back from her face and fold her hands, with the chains tinkling on her wrists. He should tell her once again that he was sorry—

He passed the toy shop, and the ghost of Lorrine seemed to walk with him. *The Star of Bethlehem—It was a beautiful symbol—It will always be*— How deep and gentle had been her faith.

He walked on, the familiar street bringing back the memory of her with aching vividness. It was here she had said, "You've never had anyone who cared for you?" and he had cut her with the coldness of his answer. And it was here that she had told him of the things they would do when they were free. He had been grim and silent —he should have talked to her and let their last hour be one of friendship,

and the confidences of those who face the same peril.

She had known, somehow, that it *was* her last hour and she had wanted him to talk to her, to pretend with her that it was not her last hour and to warm the cold dread of it. She had been frightened by the loneliness of it and she had appealed to him, in her way, to not let her be so alone.

He had thought it better to act hard and indifferent. He had not really understood, then, and now it was too late.

"Johnny!"

He jerked his head up and saw her coming down the walk toward him. It was Lorrine, her footsteps clicking softly as she hurried toward him, the chains on her wrists jingling and the tenderness and radiance in her smile.

He waited, his face hard and haggard. It was an illusion, something to turn the knife deeper in his heart. Lorrine was dead—he had killed her. This was a vision conjured by his own sorrow, and she would vanish in a moment. She would stand before him, to drive the knife deeper, then, when he reached out to touch her, she would not be there. She would be gone, but the knife in his heart would remain.

She stopped before him, the smile trembling uncertainly. "Johnny! Aren't you . . . aren't you glad to see me?"

"No!" he answered harshly. "You're not Lorrine . . . I killed her!"

"I am!" She laid her hand on his arm. "See—I'm as real as you are."

Her hand was warm and real. He held to it, as though by so doing he could prevent her from vanishing.

"But I shot you," he said. Doubt assailed him, and he demanded fiercely, "Are you really Lorrine, or are you something sent to torment me?"

"I'm Lorrine," she said. "I wouldn't ever want to hurt you. I'm Lorrine—it was the thing in this city."

"What do you mean?"

"It's like an amoeba in a way, only much more complex. It can change form at will, and it can do almost anything. It was watching us all the time we were coming through the city. It couldn't understand why we did the things we did—why we believed in something enough to die for it. It couldn't understand, and it wanted to know. It's more intelligent than humans, but only with physical things. It had no emotions and couldn't comprehend such things. So, when I was dying, it came to me and reproduced my mind and emotions in itself.

"It was an experience different from anything it had ever known and, for a long time, I don't think it was itself. But it remembered me and began to work on me before it was too late. It took all this time for it to reconstruct the tissues, and it came back to normal and remembered you just after you killed Harker. It saw you weren't hurt, so it let me go and it went back to the central part of the city.

"And do you know what it's doing?"

There was joyous elation in her eyes. "It's getting ready to help us! Now it wants to do what I wanted to do, and it *can*—it can make things for us that will let us overthrow the State in a week. And it's going to do that. It's going to help us, and then our people will be free!"

"It's hard to believe," he said. "I couldn't believe such a thing at all, but you're here and alive." He drew her closer to him. "A man gets weary of death and violence and he wants things he knows he can never have. If this is true, what you said, maybe it will mean the end of it all—maybe the time will come when a man can have these things he wants."

"It will!" she said. "I know it will!"

"If this thing can help us destroy the State, what then?" he asked. "We'll owe it our freedom and our lives. How will we repay it?"

"It doesn't want us to feel grateful," she said. "It's helping us because it *wants* to help us. And it said it would retire behind a force-field barrier after its work was done. It said it would be better for it to do that. But it will lower the barrier years and years from now, and when humans come into the city it will have something it wants to tell them."

"I don't understand, and I find it hard to believe," he said. "But if this is true, it doesn't matter whether I understand this thing's way of thinking. It has promised to help us, and it gave you back to me—that's all that

really matters after all."

He stood for a while, content to hold her close and let the reality of her presence wash away all the hurt and bitterness of the hours before.

"It's been a long and lonely night, Lorrine, and I thought I had lost you. Now we'll see a new day, and the loneliness is over."

"The loneliness is over, Johnny—forever and ever!"

An intelligent entity can learn much in fifteen years, of things that are nonlife and of the here and now; of things that react for but the moment, with neither will nor purpose.

But in the motivations of Lorrine was a purpose that went back into Time; back to the very beginning; back, back down two billion years. In her motivations was not unreason but a wisdom accumulated during millennia upon millennia of experience with life and living; a wisdom gained from lessons hard-learned by trial and error and born as instincts into the succeeding generations.

As it realized the true extent of Lorrine's learning in the first brief moment of inspection, it suddenly realized another thing for the first time—it knew nothing of life. It was a living thing, itself, yet it knew nothing of life; all its knowledge was of physical nonlife.

It could learn of life from Lorrine; it could find in her all the accumulated learning of an organism that had evolved and changed and fought to survive, trying and dying and learning—learning, always learning—while the sun swung ten times around the galactic Center; ten great, slow swings of two hundred million years each.

Trying and learning for ten times two hundred million years—and *it* had been learning for fifteen years!

Its thirst for knowledge was insatiable and it hastened to accept the new learning, eager to add it to its own storehouse of physical learning. With the reproduction of her emotions it understood, but it was not like the learning of a physical fact.

In the emotions it absorbed was all the power of the wisdom and the purpose; a power so unexpected, so irresistible in its impact, that with the first understanding came, for a little while, near-insanity. For a little while its cold logic blurred into a mist of nothing and it was dazed by the wonder of what it had found.

It was the sudden acquisition of a heritage; not of fifteen years but of two billion years. It had a true conception, for the first time, of the multitude of things a speck of protoplasm must learn to survive and evolve for thousands upon hundreds of thousands of generations. It was an understanding of the prime purpose of life; to live, not alone as an individual for one lifetime but as an immortal species for all the lifetimes into eternity.

It was both an understanding and a *feeling*—and in the feeling all the old,

old lessons were embodied as a dynamic, driving force. Faith was there, and hope. Faith and hope for a tomorrow that would dawn on a free people; both beckoning onward toward the infinitely distant goal. Courage was there, and hate; courage to fight for that tomorrow and for that infinitely distant goal; and hard, sharp hatred for those who lived only for self and refused to understand. Many things were there; things that, without their full absorption, an objective, analytical mind could not comprehend —all the things that make up human emotions. Their understanding was not like the learning of a physical fact; it was both a wisdom of the mind and emotions within—overpoweringly vital and alive.

It was something difficult to fully perceive at first, blindingly difficult to fully perceive, but it was wonderful. It was not existence, it was *living!* And it was wonderful—radiantly, unbelievably wonderful.

It adjusted itself slowly to the new learning but a part of its mind remembered Lorrine before it was too late. It acted, in those short minutes that lie between the last beat of the heart and the swiftly reaching hand of irrevocable death, and set her still heart to beating again. It began to restore the destroyed flesh but, even with its powers, the restoration was slow and it had fully adjusted itself by the time the wound was healed.

It adjusted itself and it had, for the first time in its life, a purpose. It had, for the first time in its life, an understanding of the difference between physical things and living things. It was no longer content to exist in the here and now; it was a living thing and it had learned that life cannot be as one single mortal unit; that it must go on as a never-ending stream of generation upon generation.

It had a purpose at last. It knew what it wanted to do, what it must do. It could not remain aloof from this life form that had taught it of life; it was human in the emotions and learning it had absorbed, it could not be other than human in all its desires. It had absorbed the idealism of Lorrine and it knew, now, that her ideals were not illogical; it knew that they were an expression of the never-ending trying and learning and a manifestation of the ceaseless drive of the prime purpose.

It could divide its body into as many parts as it wished, and the parts could assume any form, either temporary or permanent in cellular structure. It was human in all its desires and motivations, intensely, utterly human, and it had no reason to retain its natural shapeless mass. So it began to divide its great body, sending it out into the night as human forms; forms that *were* human in structure, completely, perfectly human to the tiniest cell and with the heritage and idealism that had been Lorrine's. And

they took with them something else; the means to carry out her desires, the physical learning that had been the city-being's.

A small portion of the city-being would remain behind. It would join the others soon; as soon as the State was overthrown and there was no longer the need for the manufacture of the things necessary to destroy it.

Then it would throw up its barrier, and the last of itself would go out into the night. Within the barrier a radium clock would count off the years until all its human forms had merged, generation upon generation, with all other humans. Then, far down the years to come, the clock would reach the time set for it and the barrier would fall. Humans would enter the city, curious to know the thing it had promised to tell them.

But they would find the city empty, and only an inscription on a stainless steel plate in a small stone building:

Here a woman died for something intangible and I wondered why. I was curious and I absorbed her learning to find the nature of her motivations.

When I acquired her learning I discovered myself for what I was; an entity without purpose or plan, without a heritage of the past to teach me. I had possessed knowledge, but wisdom comes only with time and time had been denied me. In my existence had been no purpose, no conception of purpose. I was a single unit of life, living in the present.

I found in humanity a life that had never ceased for two billion years; a life that had been learning for two billion years and intended to live and learn for all time to come.

I was Life, without knowledge of life. When I acquired the learning of a life two billion years old I could not logically do other than abide by that learning. When I accepted the learning I could not do other than accept the purpose. In return I gave humanity my physical knowledge, to better carry out the purpose.

I had knowledge and power, but humanity had something greater: wisdom and a purpose.

So do not look for me in this city—you, yourselves, are that which you seek.

THE END

SPACE HEATER

*A "**space heater**" usually means a stove or the like for heating a room. But when you use a star for the stove, and a solar system for the room, figuring out how to be comfortable as you move around in that room calls for some tricky analysis of radiation problems!*

BY J. J. COUPLING

Some people just naturally like to figure in big numbers. Mark Twain did. It gave him a lot of pleasure to calculate how many dollars laid edge to edge would encircle the world. Thomas Benton says that his father covered the inside walls of an outside building with endless calculations.

Amateurs with a real scientific bent want to get a little more out of their figuring. They want to calculate something really interesting and important. Alas, that isn't very easy. Everyone who makes his living by science or technology knows that, as a general rule, the problems you can solve aren't the ones you are most interested in, and the problems you are most interested in aren't the ones you can solve. Textbooks are just full of elegant problems which are there only because the author knew or was able to get the answer, but the real scientific problems of the real world are the bane of professionals, let alone amateurs. Thus, it is really a pleasant surprise to find a whole field of problems which anyone who can add, subtract, multiply and divide can solve, with a little common sense and a little instruction, and maybe, a very little algebra. And, it is not only a surprise but a true occasion for rejoicing when one finds that these problems concern a vital part of something all science-fiction readers are interested in—that is, space travel.

A spaceship has to get from here to there, and some of the problems concerned with this are as tough mathematically as physically. Further, however, it has to get there with its passengers neither cooked nor, until those days of suspended animation about which we read, frozen. Consider the plight of the man in the spacesuit.

Does he freeze or does he melt? What about exploration inside of the orbit of Mercury? How close to the sun can we safely go? It doesn't take genius to answer these questions. In fact, it takes scarcely any effort at all, as I hope to demonstrate to any who care to read.

Here on earth, heating and cooling are complicated indeed, for we have to worry about heat carried off by the breeze and by the material on which an object rests, as well as by radiation. And, heat can be carried to an object in the same variety of ways. Out in space things are different. Unless we actually throw material away so that heat goes with it, as in rocket jets, for instance, the only way heat leaves an object is through the radiation of electromagnetic waves; infrared rays entirely in the case of cool bodies, and visible light as well in the case of very hot ones. Heat can reach a body as radiation, or it can be generated in the body, through chemical processes in a human body, or through chemical, electric or atomic processes in a spaceship.

The law of radiation is almost unbelievably simple. If the area of the surface of an object is A square centimeters, the surface radiates a power P watts given by

$$P = 5.73 \times 10^{-12} \, e \, T^4 \, A$$

Here T is temperature in degrees Kelvin, which is degrees centigrade plus 273. Water freezes at 273 degrees Kelvin and boils at 373 degrees Kelvin, and body temperature is 303 degrees Kelvin. The constant e is the radiation efficiency or emissivity; it varies from unity for a dead black surface down to 0.1 or less for a shiny surface such as metal.

With just this one first piece of information we can calculate some interesting things. Suppose that a man is left in interplanetary space in a can, representing a spacesuit, which is a foot and a half in diameter and six feet long, or, about 46 centimeters in diameter and 183 centimeters long. How hot will he be? Will he freeze or boil?

The area of the can turns out to be 29,800 square centimeters. Suppose that the can is at body temperature, 303 degrees Kelvin. The heat loss will depend on the emissivity e:

Emissivity, e	Heat loss, watts
0.1	144
1.0	1,440

The human body just in living produces heat at a rate of 150 watts. Thus, if the can, or spacesuit, is nice and shiny, the man will stay warm, but in a black spacesuit he will cool down in a hurry.

This heating may be marginal, however, for suppose that the spacesuit must be considerably larger to contain food, water and air tanks. Can we still keep the man warm, using just his own body heat? Nothing is simpler. All we have to do is to put a

shiny heat shield around the spacesuit. This is illustrated in Fig. 1. The inner rectangle stands for the shiny can-shaped suit, and the outer, surrounding rectangle stands for the shiny surrounding can which acts as a heat shield.

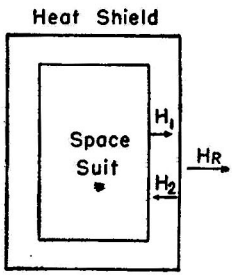


FIG. 1

Fig. 1. The heat loss of a spacesuit can be decreased by enclosing it in a shiny radiation shield. If the suit and the shield both reflect ninety per cent of the heat falling on them, the suit will lose heat only 1/2.9 as fast as it would if unshielded.

Now, if the man produces heat at a rate of 150 watts, this is the rate at which heat must leave the walls of the outer can or heat shield. I have placed an arrow marked H_R to indicate this 150 watts. Between the spacesuit and the heat shield I have shown two arrows, H_1 and H_2. H_1 is the rate at which heat flows from the spacesuit to the heat shield, and H_2 is the rate at which heat flows from the heat shield back to the spacesuit. Since heat doesn't accumulate in the heat shield, clearly

$$H_1 - H_2 = H_R$$

We know something else as well, however. H_2 must consist of two parts. First, if the inside and the outside of the heat shield are equally shiny, an amount of heat H_R will be radiated inward as well as outward. Secondly, some fraction R of the heat H_1 will be reflected back to form a part of H_2. If the emissivity e is 0.1, R will be equal to 0.9. Then we will have

$$H_2 = H_R + 0.9\,H_1$$

We need to know still more to solve our problem, however. Consider the outside surface of the spacesuit itself. Suppose that if it were in space it would radiate heat at the rate H_O. It will still radiate heat at this rate, but in addition it will reflect a fraction R of the heat H_2 flowing toward it. If the reflection coefficient R is 0.9, then we must have

$$H_1 = H_O + 0.9\,H_2$$

Those a little skilled in algebra will be able to deduce the relation of H_O to H_R by solving these three simultaneous equations. I did, and I found that

$$H_O = 2.9\,H_R$$
$$H_1 = 20\,H_R$$
$$H_2 = 19\,H_R$$

I invite the reader to check these values in the equations. The moral, however, lies in the first value, that of H_O. This says that if the suit surrounded by the heat shield lost heat at the rate of 150 watts, the suit without the heat shield would have lost heat 2.9 times as fast, or at a rate of 435 watts. By adding the heat shield, we have cut down the heat production necessary to keep the suit warm from 435 watts to 150 watts.

This may seem a modest gain, but more is to come. Suppose we regard the suit plus the shield merely as a special shielded suit, and proceed to add another heat shield. The two shields clearly make the ratio between the heat radiated and the heat that the completely unshielded suit would lose, not 2.9, but 2.9 times 2.9 or 7.41. Three shields would give a ratio of 70, five shields 200, and so on. The ratios, of course, would be higher for shinier shields which reflected a larger fraction of the heat.

One gratifying thing is that there just isn't any problem in keeping warm in interstellar space. If we use enough heat shields, body warmth will do it, or even a candle. There isn't much problem in losing heat, either, for we have seen that a black drum a foot and a half in diameter by six feet long will radiate power at a rate of over 1,000 watts even at body temperature. But I think that perhaps the most surprising aspect of the whole matter is that one can figure this out with just a simple formula and a little common sense.

As interstellar space poses no problems, we may as well tackle the solar system. Here, as before, we have the radiation of the spacesuit or other body to deal with, but we also have another source of power: the heat of the sun. To take this into account we need a new law to work with. Figure 2 shows the sun, of radius r, a distance L away from an object which has an

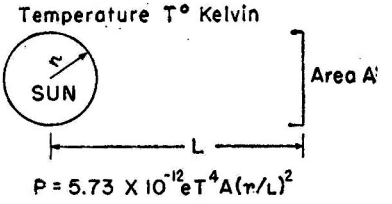


FIG. 2

Fig. 2. When an object presents an area A square centimeters to the sun, which has a radius r and is at a distance L, the power in watts falling on the object is as shown. The emissivity e may be taken as 1.0 and the temperature T as 6,000 degrees Kelvin.

area A as seen from the sun. The power P in watts which falls on the area as radiation from the sun is:

$$P = 5.73 \times 10^{-12} \, e \, T^4 \, (r/L)^2$$

Here e is the emissivity and T the temperature of the sun. We can take e as unity and T as 6,000 degrees Kelvin.

If we compare this formula with the very first in the article, we find them alike except that the second is multiplied by the square of the ratio of the radius of the sun to the distance from the sun. We can explain this easily. Suppose we took an area of a square centimeter and brought it right up to the surface of the sun, so that r was equal to L. Then all the heat the sun radiates over one square centimeter of its surface, as given by the first formula, would fall on the centimeter square area, and this just agrees with our formula for heat from the sun. As we go away from the sun, however, the heat received falls off as the square

of the distance, and hence the ratio of r to L appears squared.

What can we calculate by means of what we now know? Well, consider a disk, black on one side and shiny on the other, with an emissivity e of 1.0 on the black side and 0.1 on the shiny side. For a given temperature of the disk we can calculate the total power radiated from both sides by means of our first formula. This radiated power is the same no matter which side of the disk is turned toward the sun. We can also calculate the rate at which heat is absorbed by the side of the disk turned toward the sun. This is

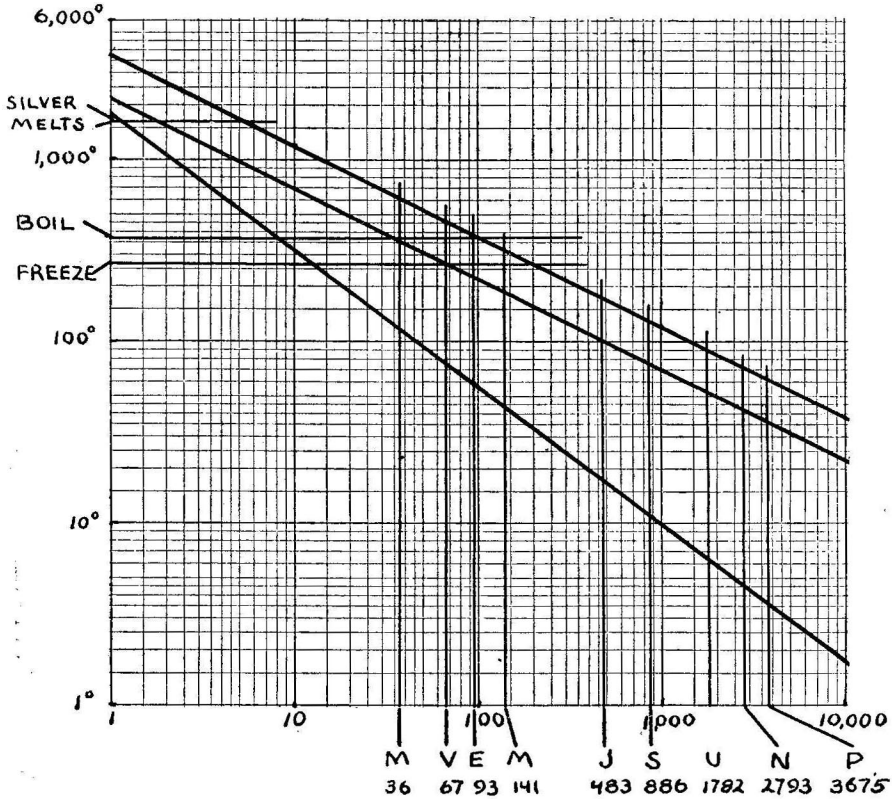


FIG. 3

Fig. 3. Temperatures of various objects at various distances from the sun, the distances measured in millions of miles. The topmost line is for a disk dark side toward the sun and shiny side away. The middle line is for a disk shiny side toward the sun and dark side away. The lowest line is for a cone, shiny base toward the sun and dark sides just shadowed from the sun by the base.

just the rate at which heat reaches the sun, calculated from our second formula, times the emissivity, which is, we have noted, one minus the reflection coefficient.

When the dark side of the disk is turned toward the sun, all the power from the sun which falls on the disk is absorbed. When the shiny side of the disk is toward the sun, only a tenth of the power falling on the disk is absorbed and the rest is reflected. In each case, the temperature of the disk must reach a value such that the power radiated is just equal to the power absorbed, and so we can calculate the temperature of the disk. This is shown vs. distance from the sun in millions of miles by the two upper slanting lines in Fig. 3. The uppermost line is, of course, for the disk dark-side toward the sun; the lower for the disk bright-side toward the sun.

At the bottom of Fig. 3 I have indicated the planets and their distances from the sun: M for Mercury, V for Venus, E for Earth, M again for Mars, and so on. We see that between Venus and Mars, the disk temperature can be varied from too cold for comfort to too hot to bear simply by turning one side or the other to the sun. This is after all what we should expect. Like the disk we have been talking about, the planets are simply objects which receive heat from the sun and radiate it into space. Their mean temperatures should lie somewhere between those of disks bright-side toward the sun and dark-side toward the sun. If we find that our disk will attain a tolerable temperature in the Venus-Earth-Mars regions, this is for the same reason that only these planets are warmed by the sun to temperatures which we can consider to be tolerable.

Woe betide the rocketship which ventures nearer to the sun, even if unmanned. Fig. 3 tells us that a flying saucer of solid silver, shiny on the side toward the sun and dark on the other side, would melt at a distance of about 1.8 million miles from the center of the sun.

Have we been pessimistic, though? Suppose that we make the ship in the form of a cone, as shown in Fig. 4.

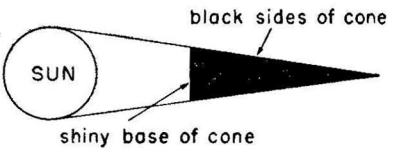


FIG. 4

Fig. 4. The shiny base of the cone shields the dark sides from the sun. The dark sides radiate the maximum possible amount of heat.

The angle of the cone is to be such that the base just shadows the sides from the sun. The base is shiny, to reflect the sun's heat. The sides of the cone are black, to radiate heat most effectively. Assuming an emissivity of 1.0 for the black sides and of 0.1 for the shiny base, I computed the temperatures of such conical ships at different distances from the sun and got the

lowermost slanting line in Fig. 3. This tells us that if the cone were silver it would melt when about 1.2 million miles from the center of the sun. As the sun's radius is nearly a half a million miles, this is pretty close indeed.

I don't think that anything can get much closer. Refrigeration can't help; the only way to dissipate more heat is to make the radiating surface hotter, and we've already put it at the melting point. The only way to receive less heat is to make the base shiny, and we've done this. We have found the true doctrine for approaching the sun, and we can't get closer.

Can we get even this close? After all, a man can't live at the melting point of silver. In principle, all is well. What we do is to cut off the tip of the cone, leaving a conical zone of shadow. In this we navigate our ship, as I have pictured it in Fig. 5. We can make the

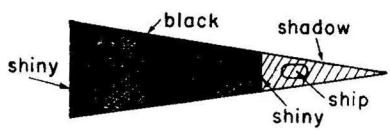


FIG. 5

Fig. 5. The cone is too hot for life. We cut off the tip and navigate our spaceship in the cool shadow.

cut-off surface shiny if we wish, so as to radiate less heat toward the ship. In any case, the cone is much cooler than the sun, and our ship will be very cool indeed in the shadow of the queerly shaped but well designed parasol.

Having disposed of the problem of melting from the sun's heat, let us return to that of freezing from the lack of it. We have already seen that we can solve this problem by the use of multiple heat shields around a spacesuit or a spaceship. When we have the sun's heat available, however, this may not be the best solution. We see, for instance, that out Saturn way an unshielded ship would get cold indeed if one waited for the unaided sun to heat it. This is because Saturn is almost ten times as far away from the sun as is Earth, and the sun sends scarcely a hundredth of the heat to a given area as it does near Earth.

One obvious remedy is to use a concave mirror to focus the sun's rays on suit or ship. Further, we know just how big to make the mirror! Since at Saturn a given area receives a hundredth the heat it does at Earth, we must have a mirror a hundred times the area of the suit or ship as seen from the sun. You will see that the required ratio of mirror-size to ship-size or suit-size varies as the square of the distance from the sun.

There is more yet that we can do by the proper manipulation of radiation. What, for instance, about air-conditioning a spacesuit or a spaceship? Won't the atmosphere get muggy from perspiration, for instance? The answer is shown in Fig. 6. On the shadowed side of a suit or ship we put a blackened bulb at the end of a tube or pipe.

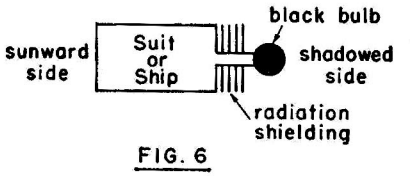


Fig. 6. We can freeze water and carbon dioxide out of the air by passing the air through a black bulb shielded from the heat of the ship or suit.

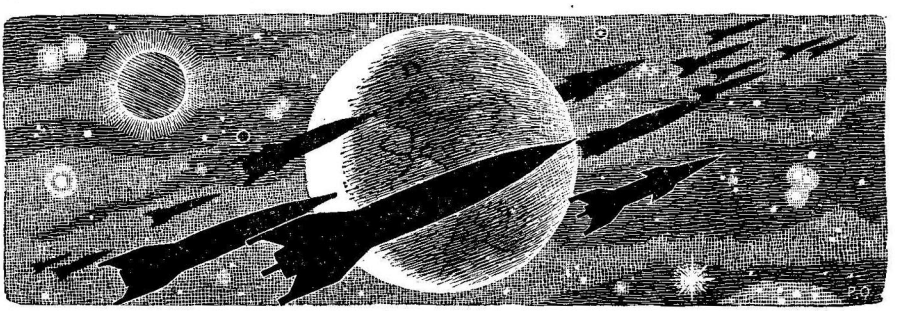
Between the bulb and the ship we can put shielding so that the bulb won't be warmed by heat radiated from the ship. The bulb loses heat by radiation. Water vapor simply freezes out of the air in the bulb. All we have to do to lower the humidity in the ship is to circulate a portion of the air through the bulb. And, we recover the moisture as ice in the process. We can get back the water merely by thawing the ice.

If we shield the bulb well enough, we can freeze out, not only the water, but carbon dioxide as well, provided that we do not insist on using this up in growing plants instead. Once we have extracted the carbon dioxide from the air, why cannot we decompose it with solar energy on the bright side of the ship, and so get back the oxygen at least?

Shielded objects of course can serve as low-temperature storage reservoirs for liquid gases, and, I suppose, as lockers for frozen foods. In some cases, the order for preparing a cooked meal might well be: "Move a steak from the dark side to the bright side, Joe."

It would be foolish to try to think of all possible uses in space navigation of heating and cooling by radiation. The reader can amuse himself by inventing devices on his own. Vacuum tubes with cathodes heated by burning glasses, for instance, or space stations that reorient themselves with respect to the sun by means of the jet of steam which is produced when the light from a burning glass falls on a tube of water. It is easy to see that many of the problems which science-fiction writers solve by complicated and obscure means can be solved by an ingenious use of sun and space instead. And the beauty of it is, that even a mathematical tyro can calculate pretty well what is needed and what will happen.

THE END



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BY P. SCHUYLER MILLER

ONE MAN'S SCIENCE FICTION

When I skimmed through the galley proofs of L. Sprague de Camp's "Science Fiction Handbook"—Hermitage House, New York. 1953. 328 pp. $3.50—last spring, I formed the immediate impression that this how-to-do-it book was "one man's science fiction," which set forth very clearly the cerebral, calculated, carefully thought out de Campian attack on a story but might not hold water for others. Now, after a careful reading, I'm ready to back a good deal more than halfway down from that impression.

This is much more than a writer's handbook, you will find, though it joins a respected series in which Marie Rodell's manual of mystery writing is perhaps the classic. It begins by telling the newcomer to the field what science fiction is—presents perhaps the best capsule history of the field in print—characterizes the current magazines, their editors, and the pride of today's top practitioners of science fiction and fantasy—and then gets down to cases.

In the introduction to the new Bleiler-Dikty "Best Science Fiction Stories: 1953"—which I hope to get around to soon—Alfred Bester, per-

haps justly, charges science fiction with all sorts of sins including a paranoic persecution-complex. I'm inclined to think that we have also been afflicted with the other aspect of paranoia, delusions of grandeur as to the status and influence on civilization of Science Fiction. There is none of this over-inflation of self-importance in de Camp's "Handbook." Moreover, he realistically includes the entire imaginative field—science fiction plus "fantasy"—in his scope, as he does in his own writing.

In a nutshell—if I am not misreading the de Camp approach—he says: "Here is a field of fiction which gives the writer an unparalleled opportunity to play around with ideas, effects and every other ingredient of literature, including both settings and people. If he's extremely skilled, he may find himself writing books or stories on a par with the best 'serious' fiction. He won't get rich at it—but he'll have fun."

The last third of the book suggests ways of having some of that fun yourself.

I said above that my first reaction was that the recipe which works for one of L. Sprague de Camp's carefully planned yarns is not at all likely to work for the intensely emotional kind of story which you expect of Ray Bradbury or Ted Sturgeon. Now I'm not so sure, for there's not much doubt that the better the craftsman, the harder he works at his craft. Even though Bradbury and Sturgeon both often give the effect of an explosion of mood, communicated at white heat, and though their stories may possibly be written that way—as some writers' indubitably are—I suspect that the kind of planning which seems to come out into the open in a de Camp story either proceeds subconsciously with more subjective writers, or makes itself apparent in word-polishing and revision after a first draft is on paper.

You will find that de Camp gives this subjective type of writing its due throughout the "how to" section of his book, though he naturally emphasizes the techniques which he himself uses. If your forte is action-adventure, in other words, it's less difficult for you to learn enough astronomy and astronautics to avoid ridiculous errors and then write space opera than for you to attempt one of Heinlein's or Clarke's realistic episodes from a probable future. What the "Science Fiction Handbook" makes clear is that you should take the trouble to do this minimum of preparation. Everyone loves a good space opera, but oh how we rail at a poor one!

To get back to specifics, the "how to" section of the book begins with a chapter on preparation: learning to write English, or at least passable American—writers' conferences—boning up your science.

Now there are, it is common knowledge, few if any writers in the field with a more encyclopedic knowledge of science, history, languages and assorted tidbits than L. Sprague de Camp. This is the result of a combination of aptitudes, background and inclination which isn't often found these days. If Will Durant hadn't already started his current panorama of Western civilization, Sprague de Camp might already have finished one of his own. *But* this so-called "human encyclopedia" attribute by no means allows him to draw his science wholly out of his own head. What it does do—and what it is very difficult for anyone without some scientific training to do—is tell him what to look for, and where to look, with a minimum of waste time and motion.

You'll find, glancing over the bibliography of popular books on science at the end of the "Handbook," that these—the really good ones—gravitate into a very few fields: Astronomy and cosmogony predominantly, some physics and especially atomic theory, a scattering in biology, psychology, anthropology. Chemistry is represented by only one book in about thirty, and that dating from 1936. And doesn't this pretty well mirror the bulk of present day stories, also? Moral: pick a field with possibilities and make yourself an expert on it. (There are no complete, up-to-date generalizations of American archaeology, for example, to compare with V. Gordon Childe's books on the Ancient East, and nothing at all for other vast areas of the globe. I do not except "Gods, Graves and Scholars," which tells you about archaeologists but not about archaeology—or I'd long since have reviewed it here.)

"Where Do You Get Those Crazy Ideas?" "Plotting an Imaginative Story," "Writing an Imaginative Story," "Selling an Imaginative Story," "Being an Imaginative-Fiction Writer" —with a section by Catherine de Camp on the perils of marrying an author—complete the book. The titles speak for themselves, I think. You may be interested to know—1940 United States Census—that there are about as many authors as actors in this country. Offhand, thanks to Equity and the various guilds in Hollywood, the actors probably eat higher on the hog but perhaps not so often or consistently as the writers, most of whom can find hamburger money in other jobs.

But you don't want to write science fiction (you think!); you want to read it. So why should you concern yourself with a handbook for writers of the stuff?

Primarily, I should say, because de Camp's "Handbook" is about the calmest, sanest over-all view of the field we've had. It doesn't credit science fiction with too much—with being a "literature of prophecy," "the literature of the future," "the only

literature free of inhibitions." Nor does it take the other tack and castigate it for not remaking human nature or human society, developing new forms, spawning great movements.

Sprague de Camp recognizes that imaginative writing—his term for science-fiction-fantasy—is a field of storytelling which has existed for a very long time. Originally the fantastic was dominant (though perhaps not regarded as fantastic, when people believed implicitly in demons and magic); now tangible science is on top. Primarily it is read, and therefore written, for entertainment—but it is a form of entertainment which juggles with ideas about the universe and its contents, much as "Pilgrim's Progress" and the many morality plays and tales played with ideas of human relations.

Out of this vast body of entertaining fiction will emerge some memorable books and stories. They will emerge for two main reasons: the authors had something to say, and they knew how to say it. But there is no reason, Mr. Bester, Philip Wylie, Bernard de Voto and other critics to the contrary, why science fiction should produce more memorable and "lasting" books than any other field of popular writing.

If you have a message about man's place in the universe, or the future of humanity, or the key to a stable society—or a means of guaranteeing instability, if you think that's what we need—you may be able to shake the world with a book as unreadable as "Looking Backward" or "Erewhon." Chances are, though, that you'll do much better if you study the "Science Fiction Handbook" and learn some of the trade secrets of the skilled writer before you try to make your mark.

Conversely, you may be the kind of born storyteller who can strike fire from any random set of words. It will still help you to put some meat on the bones of your story. I don't think Edgar Rice Burroughs would have run dry if he'd bothered with some of the homework Sprague de Camp suggests.

A GUIDE TO THE MOON, by Patrick Moore. W. W. Norton & Co., New York. 1953. 255 pp. Ill. $3.95

Good popular books on astronomy —maybe textbooks are an exception, but they rarely come to the public's attention—have a way of going out of print and never coming back. Only the few classics remain, and these are primarily books of philosophy rather than scientific exposition.

"A Guide to the Moon" is a good general work by a young selenographer, one of the foremost in Britain, who believes implicitly in some sort of vulcanism as the source of the lunar craters and as implicitly that the theory of meteoric origin is absurd. This perhaps mild flaw—since

there is no really satisfactory, all-encompassing theory any more than there is for the origin of the solar system—plus a certain repetitiousness which makes parts of the book sound like successive lectures in a broadcast series, fail to offset an excellent general overview of what the Moon is like.

Mr. Moore, by the way, will also endear himself to science-fiction readers as a strong partisan of a lunar atmosphere—approximately 1/10,000 the density of the Earth's, as a maximum—which is needed to account for numerous reports of mists and clouds on certain sections of the satellite, and which in the author's opinion would serve as a meteor-shield for a lunar base, at least as efficient as our own atmosphere.

A keyed sketch-map of the Moon serves as endpapers for the book, and there are numerous sketches of formations and photographs. There could be more, for there is no more fascinating object in the skies—or one better recorded.

The backgrounds of lunar observation are sketched in, and some ideas as to its origin. The author then goes into his especial field of selenography and through half the book describes the classes of lunar features, as well as some particularly interesting ones. He is not averse to primitive, vapor-fed, lichenous vegetation along some clefts but is not impressed by Pickering's swarms of lunar insects in Eratosthenes.

The closing chapters go over the fundamentals of rocket flight, a space station, and what is needed at a lunar base. There is a series of meaty appendices, one on what the amateur can contribute to lunar observation—most consistent students of the Moon are amateurs—one on available maps and atlases, a table of lunar eclipses up to 1987—when a new edition of the book should be about due—and finally a sort of lunar gazetteer.

A handsome jacket illustration in color, though not up to Bonestell, is good enough so that it should be inside. My recommendation on this is: read it first, in your public library, which will almost certainly have to have it. Then if there's enough in it that you don't already know from other sources, buy it.

WORLD OUT OF MIND, by J. T. M'Intosh. Doubleday & Co., Garden City. 1953. 222 pp. $2.75

Here is the most successful blending of mystery and science fiction that I have yet seen, the work of a Scots journalist—the copyright is in the name "James MacGregor"—from whom I hope we'll be hearing more.

Eldin Raigmore is introduced as a stranger in the human society of our distant future—a man with only a few days' past who does not know who he is, why he is masquerading as human, or what his mission among men may be. Step by step he takes the Tests which will qualify him for

higher and higher rank in human society. One by one he comes across other masqueraders like himself. Bit by bit the truth of his mission becomes apparent to him . . . and his qualms develop, for he finds that he likes humanity. Not until page 167 is Raigmore's first problem solved, to be immediately replaced with a greater one.

The account of the Tests—far more convincing than the "Null A" Games—is fascinating; the people with whom Raigmore must work out his fate are believable and likable. Only the ultimate invaders are sketchily drawn. Here is a science-fiction novel that isn't all cult and formula—one that should appeal to the general reader as well as to the hardened fan.

THE TRANSCENDENT MAN, by Jerry Sohl. Rinehart & Co., New York. 1953. 244 pp. $2.50

The attempt to blend detection with science fiction, perhaps in an attempt to snare part of the great whodunit audience, seems to be growing in strength. Actually, of course, mystery and detection have long been the key to some of the most popular science fiction—van Vogt's books, notably—so perhaps this is neither surprising nor deplorable, if it's done well.

Jerry Sohl, to me, hasn't succeeded quite so well with this new book as in "The Haploids" last year. Magazine writer Martin Enders is sent to spy on Dr. Eric Penn, head of a top-secret government project about which not even the government can discover anything. He immediately comes face to face with a string of seeming impossibilities—and on page 117 he is dead. Annihilated. On page 119 he is back again, rescued by the scientist's beautiful daughter and with half the book ahead of him.

Van Vogt might have gotten away with it: hell's bells—he did, over and over again. Sohl doesn't, quite, especially when he is up against as fine a job as J. T. M'Intosh's "World Out of Mind," which also deals with an alien invasion and far more convincingly.

THE UNDYING FIRE, by Fletcher Pratt. Ballantine Books, New York. 1953. 148 pp. $2.00; paper 35¢

Here is another of Ballantine Books' experiments in simultaneous publication of books in paper- and cloth-bound format. It's pure entertainment—not a "must" like their "Star Science Fiction" and "The Space Merchants," but a good, standard product which appeared as a one-shot "novel," "The Conditioned Captain," in *Startling* last May.

Captain Thorwald Paulsson, thrown out of the Space Command on a trumped-up charge, is given a chance to hamper his opponents by re-enacting the story of Jason and the Golden Fleece, and steering the good ship *Argo* across space to wrest the secret of a neptunium motor from a planet

of unreconstructed Irishmen. Hercules, who abandoned ship, is here General Vnadiv, who remains to champion the male cause on a planet of women—paralleled by the original *Argo's* adventure on Lemnos, island of women. Castor and Pollux become the telepathic twins, Halperonik and Harperonik. And as Medea, who betrayed her father for love of Jason and won him the Fleece, we have red-haired Deirdonnel of Daanan.

But this is not Greek tragedy, and Deirdonnel, though a schemer, is no witch. The story is space adventure, written and to be read for entertainment. By the Ballantine formula, it's paper-bound if you merely want to read it; cloth-bound if you want it on your shelf. And the jacket is another of those striking jobs, neither signed nor credited, which have quickly become a trademark for Ballantine science fiction.

LOST CIVILIZATIONS, by H. Rider Haggard. Dover Publications, New York. 1953. 769 pp. $3.95

The civilizations of the title of this Haggard omnibus are "lost" only in time: actually, what we have here are three of his best historical adventure novels, with the usual mystical overtones. If you're a Haggard fan, these are probably a "must" for you. If not, the Victorian touch may not sit so well.

"Montezuma's Daughter," first of the three books, is the story of young Thomas Wingfield, Englishman, who became first a slave in a Spanish ship, then a captive of the Aztecs a year before Cortes' invasion of Mexico, and finally Montezuma's son-in-law and a witness to the bloody tragedy of the Conquest.

In "Eric Brighteyes" we go back still farther to the world of the Icelandic sagas, a thousand years ago. Told in a counterfeit of the old Norse manner, with magic and sorcery taken straight as Eric's own people took them, it is one of the best and least-known of Haggard's adventure sagas.

"Cleopatra," the third book, carries us back another thousand years to an Egypt which probably never was except in fiction. It is supposed to be the story of Harmachis, a priest and pretender to the throne usurped by the Greek Ptolemies, who witnessed the rise and fall of Cleopatra.

Give Dover credit: they haven't "modernized" or edited these or any of their other Haggard reprints. Them as likes him can take him straight, without syrup . . .

THE END OF THE WORLD, by Kenneth Heuer. Rinehart & Co., New York & Toronto. 1953. 220 pp. $3.00

This little book is a far better job than the author's previous "Men of Other Planets," which turned out to be little more than a rehash of eighteenth and nineteenth century fancies.

Presumably "The End of the World" is based on research done for the Hayden Planetarium programs on the same theme, where Heuer was formerly a lecturer.

What we have, embellished with some minor Chesley Bonestell illustrations in black and white—even the color originals, which have been displayed in some bookstores, are not up to the Bonestell standard of "The Conquest of Space" or his magnificent vistas for the prelude to Hollywood's "War of the Worlds"—is an account of various ways in which it has been supposed the Earth—or life on it—may come to an end.

The book opens with a fascinating chapter on the "prophets of doom" who have prophesied the end of the world at various times and for various reasons. Then the usual astronomical bogies are treated in order: destruction by comets; by collisions with the moon, asteroids, or stars; by the explosion of the Sun as a nova or its collapse into a red dwarf. The fear that the hydrogen bomb may somehow "ignite" the atmosphere is discussed sanely.

Finally there are two chapters, very short, on the future of the Earth and the universe. Most interesting in the former are excerpts from letters by some of the twenty thousand people who "reserved" seats on interplanetary rockets, in connection with the Planetarium's "space voyage" programs.

All in all, a very pleasant little book.

CHILDHOOD'S END, by Arthur C. Clarke. Ballantine Books, New York. 1953. 217 pp. $2.00; paper 35¢

Arthur C. Clarke at times seems to be two persons in one. He will write such meticulously realistic stories as "Sands of Mars," almost pedestrian in their matter-of-factness, then turn to a book like "Against the Fall of Night," all imagination and poetry. His new original novel for Ballantine is in the latter class, yet in some ways seems to me to fall short of the Gnome book.

The West and Russia are racing to put the first rocket into space when the great ships of the Overlords appear overhead and "the human race was no longer alone." Hovering over the great cities, never showing themselves, the Overlords enforce peace on mankind. Attempts to outwit them fail—yet in the end they do show themselves, in strangely shocking guise. Man grows used to their presence, waiting for—something—and finally one man smuggles himself aboard an Overlord ship, in an attempt to locate their home-world and learn what brought them to Earth. Meanwhile Man reaches the end of his cosmic childhood and the purpose of the dominion is seen.

I seem to be a minority of one, but "Childhood's End" seems not to be up to some of Clarke's other writing in this vein principally because of the episodic structure of the story. True, the last two-thirds of the book is uni-

fied in time and theme, but it doesn't seem to me to be up to—say—"The Seeker of the Sphinx" in last year's Bleiler-Dikty "Best Novels."

CHILDREN OF WONDER, edited by William Tenn. Simon and Schuster, New York. 1953. 337 pp. $2.95

"Best-of-the-year" collections like the annual Bleiler-Dikty volumes aside, the most successful short science-fiction anthologies seem to me to be the "theme" books. And "Children of Wonder" is one of the best of these.

"William Tenn" has selected twenty-one stories about children who have strange faculties, who look at the world strangely, or who are strangely normal in a mad world. You'll find in it such classics as D. H. Lawrence's "The Rocking-Horse Winner"; Truman Capote's brief "Miriam"; A. E. Coppard's shining "Adam and Eve and Pinch Me"; Saki's "The Open Window"; the Hatchery section from Aldous Huxley's "Brave New World"; and Stephen Vincent Benet's poem, "Nightmare for Future Reference." Also by well-known authors are such little-known stories as E. M. Forster's "The Story of a Panic" and Graham Greene's superb tale of identical twins, "The End of the Party," with its horror in the last lines.

The other stories are by writers who can be considered inmates of the science-fiction-fantasy field. Outstanding among them are Theodore Sturgeon's "Baby is Three" (part of a forthcoming novel), Wilmar Shiras "In Hiding" (what matter if it's been reprinted over and over: it belongs here), Judith Merril's "That Only a Mother," and Jane Rice's thoroughly nasty fantasy, "The Idol of the Flies."

The first group of three tales is entitled "Wild Talents." With the Lawrence and Sturgeon stories is C. M. Kornbluth's unpleasant "The Words of Guru." "The Child Possessed" introduces Ray Bradbury's "Small Assassin" and Lewis Padgett's "The Piper's Son," a "Baldy" tale, with the E. M. Forster story. In "The Stuff of Dreams" are the Capote, Coppard and Saki stories, with Mary-Alice Schnirring's "Child's Play," about the game-kingdoms of Draconia.

"Terror in the Nursery" is as good a title as any to include the stories by Greene, Rice and Merril. Under "Alien Brothers" we find Richard Matheson's ugly little "Born of Man and Woman," and two more routine stories of the relations of men and aliens, Murray Leinster's "Keyhole" and Poul Anderson's "Terminal Quest." "Little Superman, What Now" brings the Shiras story and a completely new one by Katherine MacLean, "The Origin of the Species." Finally, under "In Times to Come," we have the editor's own "Errand Boy," a time-travel tale of no great importance, with the Benet poem and the Huxley section.

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This, I should say, is a book which can be recommended to the general reader who wants an introduction to the field of fantasy and science fiction. It includes both top-notch stories and good but routine items, fairly representative of the field. I liked it as well as any anthology I've seen this year.

O KING, LIVE FOR EVER, by Henry Myers. Crown Publishers, New York. 1953. 214 pp. $3.00

Some dealers are advertising this book as science fiction. Its theme—extreme longevity—fits the category as most of us recognize it. The method doesn't. Only if you're a completist when it comes to borderline books are you likely to want this one.

"O King, Live For Ever" is the life story of a man obsessed with death to the point where he is convinced he has conquered it and regained a lost human power of near-deathlessness. As the book opens and closes in 1953, he seems to have lived more than a century and aged less than half that.

As a puny child in the London slums of the 1850s, Paul Gibbs was told that he would not live long. When a young curate called on his widowed mother, little Paul saw in him the personification of Death and set out to kill the Great Killer and free himself. The man, his stepfather to be, fought back, first instinctively, then viciously—and in the end had lost his own life while Paul won immortality.

On the surface, the book is a well written novel of an obsessed personality. On the other hand, you may feel that Paul Gibbs has rediscovered a secret lost since the days of Methuselah and can control life and evolution consciously. If so, it's science fiction of a kind completely outside any formula.

KING CONAN, by Robert E. Howard. Gnome Press, New York. 1953. 255 pp. $3.00

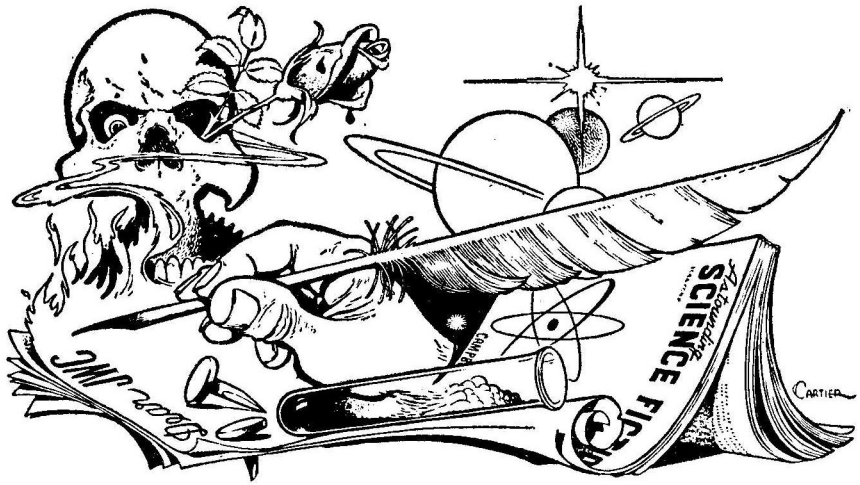
The purists among you probably consider the "Conan" yarns purest balderdash and out of place here, where we try to steer clear of avowed fantasy. It's all of that, but the big Cimmerian occupies an unique place in the fantasy field, and we're going to keep right on noticing him.

This is the third volume of Conania to come from Gnome, and the next to the last in the chronological progress of Conan from barbarian to king-emperor. It contains the original stories, "Jewels of Gwahlur," "Beyond the Black River," "The Phoenix on the Sword" and "The Scarlet Citadel," plus the posthumous "Treasure of Tranicos" as discovered and edited by Sprague de Camp. The first is a typical adventure in the "black kingdoms" of the south, with a lost palace, a treasure, villainous priests, unhuman guardians, *et al.* I like it. The second finds Conan a sort of Leatherstocking-with-a-broadsword on the northern

frontiers—Picts serve as Indians—mixed up with magic and saber-toothed tigers. The last two find him King of Aquilonia, and as intimately entangled with black magic as he ever got. The new story fits in between, as he flees through the Pict country to the coast and involves himself with an exiled nobleman, three sets of pirates, and more magic.

I've convinced myself that the reason Howard was able to make the preposterous doings of his superhuman hero so real was that he believed in him completely, and projected himself into the Cimmerian's personality. Anachronisms, contradictions, impossibilities, absurdities of all kinds seem to make no difference to the flow of the yarns. And if the de Camp personality has intruded at all into the "Tranicos" episode, it may be in a tendency to tidy up, over-explain, and knit everything together in a way which Howard could never have done—but which wouldn't have mattered one bit.

Two more volumes, I'm told, will complete the Conan tales (including some more posthumous finds), throw in the "King Kull" yarns which deal with the same pseudo-mythology at an earlier stage, and include Howard's "Hyborian Age" which sets the structure of the whole thing. These stories of Conan's earliest feats are the most preposterous of the lot—and they're the ones I like best, so you'll be notified when they appear.



BRASS TACKS

Dear Mr. Campbell:

September was a good issue, with a nice line-up of authors. I see the An Lab as follows:

1. "What Thin Partitions," by Clifton and Apostolides. The light touch is so seldom present in science fiction, and its use in this story rates it first place. The poltergeist idea seems to reflect the increasing utilization of "wild talents" as a subject for speculation, a trend I favor. I hope you'll continue to balance the abtruse, technical story with the slightly off-trail variety.

2. "Humpty Dumpty," by Lewis Padgett. A cool, finely written story, especially good in its treatment of the mechanics of telepathy. This series seems still to be alive, but what ever happened to Gallagher?

3. "The Garden in the Forest," by Robert F. Young. Just by a hair, because of its skillful handling of an old, rather trifling theme.

4. "Gimmick," by Katherine MacLean.

5. "Little Joe," by Algis Budrys.

Not a bad or uninteresting story in the lot.

There was some talk a few months back about rating the stories on a basis of ten. This would mean the readers would have to do more thinking, but even aside from that I'm not too sure how good an idea it is.

For one thing—unless one's mind is static and unchanging, in which case he wouldn't be reading Astounding—there would be a tendency to rearrange the values of the points on the scale from month to month, partly through faulty memory, partly through the natural desire to correct and improve a system which can never be perfect. Assigning word-values to the numbers, i.e., 10=classic, 9=excellent, et cetera, wouldn't help, for the words would have as many meanings as you have readers. Nor would the gap between "classic" and "excellent" be the same in all cases. You'd get, I think, a less perfect picture.

For another thing, a ten-basis system would make us judge a story for all time after only one reading. In such a system a ten-story would be one that could be reread with pleasure many years from now; I question whether we are perceptive enough to estimate how well a story is going to wear. A few of the old "classics" seem rather inept now.

It's the old problem—oddly enough, I've never noticed it worrying anyone but science fiction fans—of assigning an arbitrarily-arrived-at degree of excellence to an artistic endeavor. You can check a technical report and correct any inaccuracies in the conclusion, but here we have too many unmeasurable quantities, too many variables, too many *x's*. Let's keep the old system. It's as likely a guide as can be devised.

Now a word about something else. I've been buying old Astoundings, and one of my chief pleasures in them is to pick out stories which belong in a particular series and read them, catching up on what I've missed. It occurred to me the other day that there's been a dearth of that sort of story lately: "Humpty Dumpty" is conspicuous by its presence. We haven't heard from Clane since 1950; Asimov seems content to let the Foundation go its own way for the next five hundred years; Heinlein's stream of Future History has dried up; Simak's Dogs have evidently solved everything but the question of where they came from. Only the Baldies carry on. (They *are* carrying on, aren't they?)

Circumstances alter cases, and it may be that the extended series of stories is no longer feasible. But here you have one vote in favor of them. Those that I mentioned were not just tacked-together adventures; they were coherent, logical, progressing stories. I mourn their loss and would rejoice at their return.—Dick Ryan, 224 Broad Street, Newark, Ohio.

Science fiction is undergoing major growths and developments; during the last five years, particularly, there has been quite a change of orientation. The "wild talent" stories which you favor, for example. During such a period of change of orientation, the series stories, having a fixed frame of reference, tend to drop out.

Dear John:

With the arrival of the September issue, my collection of Street & Smith's Astounding rounds out its twentieth year. So broad an historical sweep, spanned by the memories of an ever-decreasing proportion of your readers, surely deserves a brief pause of reminiscence. Wherefore:

THE EVOLUTION OF ASF

Publishing History: "Astounding Stories of Super-Science" published by Clayton (Editor: Harry Bates), from January 1930 to March, 1933. Street & Smith reissues it, beginning with October '33, under the title "Astounding Stories," continuing the volume numbering (with XII, 2) but increasing the size of a "volume" to a more respectable six issues. Publication begins—and never misses!—on a monthly basis. Editor: Tremaine (who remains anonymous until the 4/36 issue, pp. 151–2).

Physical description of the mag: It began "pulp-sized," with 144 pages and untrimmed edges—even with a semi-nude on the cover—at 20¢ per copy. But the gal vanishes—praise be!—after the second issue. Size jumps to 160 pages in 3/34; type-face improved in 9/34. Trimmed edges, 2/36. Changes in format in '37 and '38 . . . particularly, change in title to "*Astounding* SCIENCE FICTION" with the assumption of the editorship by Campbell in 3/38 (See 4/39, p. 161). A higher price (25¢) justified by larger ("bed-sheet") size (1/42–4/43), though fewer

(130) pages, but the price remained high when the paper shortage caused two successive shrinkages (5/ and 11/43) ending in the 178-page digest size with the rotogravure section. The paper slickens a bit (2/47), the pages are cut to the present 162 (3/47), and the title-emphasis changes from Asf to aSF (8–11/46). The price-raise to 35¢ (8/51) and the new bordered cover-style (11/51) are comparatively among the most recent changes.

Art: Covers were well-nigh monopolies for long periods: Howard V. Browne (1934–7; alternating with Wesso till '38); Hubert Rogers (1940–2); William Timmins (1942–6). Astronomical covers, beginning as MUTANTS in the "evolutionary" year of '38, got a post-war revival with Chesley Bonestell in '47, a month after the first symbolic cover (Alejandro) was published.

Interior artists have included Dold ('34), Marchioni ('35), Wesso and Schneeman ('36), Orban ('38), Cartier, Isip and Kramer ('39).

Departments: BRASS TACKS, appears 12/33; changes to Science Discussions, 2/37, but gradually re-asserts itself through '40.

The first editor's page—devoted, for a long time, to plugging for the mag—in 2/34.

"In Times to Come"—appears 1/38.

"The Analytical Laboratory," appears 5/38. Point-score system adopted: 12/40.

First Book Review: 1/41. P. S. Miller becomes review editor, 11/51.

"Probability Zero!", appears 4/42, ends 12/44.

Articles: The first was Fort's "LO!", serialized, beginning 4/34; the second, Campbell's astronomy-series (beginning 6/36). Most prolific authors have been Ley ('37), de Camp ('38), Richardson ('39), Coupling ('44), Locke ('48). Outstanding specimens: "Meihem in ce Klasrum" (9/46); "Thiotimoline" (3/48); "Dianetics (5/50). 'Nuff said.

Authors: (A few of the most prolific in ASF and elsewhere):

1933: Burks, Leinster, Schachner, C. A. Smith, Vincent, Wandrei, West, Williamson.

1934: Campbell and "Stuart"; also: Bates, Coblentz, Fearn, Gallun, Long, Moore, E. E. Smith.

1935: Binder, Hamilton, Taine, Weinbaum.

1936: Wellman; Lovecraft!

1937: Bond, de Camp, Miller, Rocklynne, Russell.

1938: H. L. Gold!; Ray Palmer! . . . Cummings, del Rey, Hubbard, Jameson, Kuttner, Simak, Williams.

1939: Asimov, Heinlein, Sturgeon, van Vogt.

1940: Brackett.

1942: Boucher, Brown, Cartmill, Clement, Hull, "Padgett," G. O. Smith.

1943: Bradbury!!; Jones, Leiber.

1944: Chandler, Geier.

1946: Clarke.

1947: Anderson.

1950: Blish, Kornbluth.

Story Types: A few of the favorite general themes (naturally it's impossible to mention individual titles!):

TIME: Its paradoxes formed one of ASF's earliest favorite topics. The first THOUGHT-VARIANT (12/33), the first MUTANT (5/38)—each the fruits of a new editor's strivings for innovation—dealt with time paradoxes of, respectively, past and future. Also deserving of mention is the "Sidewise" theme, another early TV, which is even yet being exploited. ROBOTS: We cannot avoid mentioning Asimov's series (began 4/41) on the fundamental laws of robotics. Modern developments have leaned more to cybernetically-based tales in this range. SPACE TRAVEL: The most *poetically* written of ASF's stories have, I would say, been on this theme. Closely linked with it have been stories dealing with problems of adaptation to nonterrestrial conditions, and of contact (or lack of contact!) with alien races. (Semi-specialists in the latter type of tale have been Clement and Russell.)

The remainder of the physical sciences account for but a small proportion of all stories. Notable, however, are the "gadgeteering" opera typified by George Smith's VE-series (began 10/42) and such. And one must not fail to mention the classic atom-bomb-predicting "Deadline" (3/44).

The last ten years of ASF can be distinguished from the first—among many other criteria—by a growing preponderance of stories based on other than the physical sciences. While biology—particularly evolution and mutation!—has long furnished SF writers with themes, psychology and sociology have but recently come into their own. As examples of the former we must mention Padgett; for the latter—the highest type of SF, in many opinions—we cite Asimov's "Foundation" series (began 5/42), Heinlein's Future History (5/41) and Simak's "City" series (began 5/44).

We cannot disregard entirely stories whose memorability lies, not in their intellectually-slanted plotting, but in their emotional appeal. We cite three main classes, with their foremost practitioners:

Humor: de Camp, Sturgeon.

Pathos: del Rey, Moore, Stuart.

Adventure: Campbell, Smith, Williamson.

FANTASY: Only four examples in ASF were labeled as such—see 3/38, 12/43, 3/51, 9/52. But to do justice to this "theme" we cannot fail to mention Astounding's long-lamented companion mag, UNKNOWN (WORLDS): 3/39–10/43. We conjure up the mood of the mag—those literary *Atlantic Monthly* covers! The departments: "Of Things Beyond"; "And Having Writ"; poetry—and the stories!! Fantasy being even more difficult to topicalize than SF, we must content ourselves with recalling the top authors: de Camp, del Rey, Sturgeon. The top series: Harold Shea; Fafhrd and the Grey Mouser; Fergus O'Breen; and (though never admitted) the quantities of pure SF (among the first few novels!) that graced UNK's pages. But I disgress!

I conclude: Though you seem to have gotten out of the habit of publishing (or perhaps your readers of writing) long-term story-evaluation letters, perhaps this general survey will be found worth printing on this anniversary occasion. Let me, in any event, end with a suggestion: If polls of the ten best SF books, why not a poll for the ten (or some such number) best ASF stories? Azriel Rosenfeld, 475 West 186th Street, New York 33, New York.

Though science-fiction is largely "out of this world" in avowed themes, the magazine and its authors are not. A lot's happened to the nation in those twenty years, too!

Continued from page 7

others are, or can be, contained in it. Like fire, electricity and nuclear energies, imagination, too, is a dangerous force. But a mathematician, with imagination and understanding, can explode an atomic bomb in safety, and determine whether it will start a chain reaction in the Earth's atmosphere. Such experiments as that must, obviously, be conducted out of Earth's atmosphere—in the atmosphere of imagination.

Man was, of course, the first of Earth's animals to experiment with that deadly dangerous force, imagination. The early experiments with fire undoubtedly killed many men; imagination has killed many minds. Stabilizing so powerful and fluid a force, channeling its immense possibilities into useful lines, is an exceedingly difficult business. Men have sound reason to fear it.

There have been quite a few sacrifices to imagination, both directly—the insane—and indirectly, as in the case of the victims of Hitler and other paranoid national leaders.

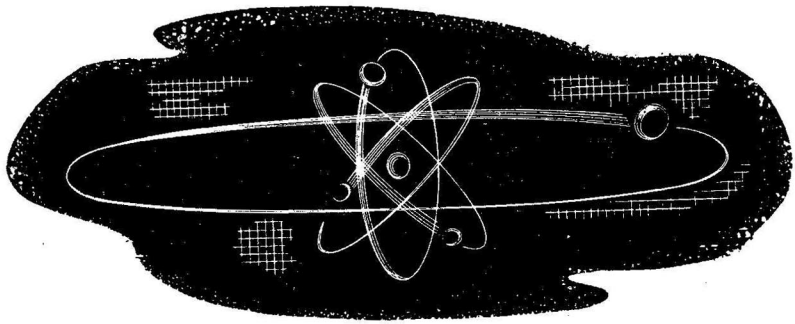
Man is the only animal who has had the cold courage to challenge that immense force. He's died, for his rashness, in droves.

But, over the centuries, we've used it to make gravity a tool, then to make fire a tool, and now electricity and nuclear forces. Gradually the mightiest of all Nature's forces, Imagination, is being investigated and channeled usefully. Its use is dangerous in the highest degree; investigating it is dangerous in the extreme.

But Man seems to be the one organism on Earth that has grasped the concept of the greater risk of not-doing. Not all men have grasped that, however. The essence of the science-fictioneer is, perhaps, in the fact that he has accepted the risk of imagination. Surely, the thing that makes a true genius is the willingness to accept an extremely high risk of imagination-burn.

In that sense, probably, genius is near to madness.

THE EDITOR.



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