FUTURE SCIENCE FICTION

JUNE

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POINT OF VIEW
science article
by
ISAAC ASIMOV

CARGO: DEATH
by T. H. MATHIEU

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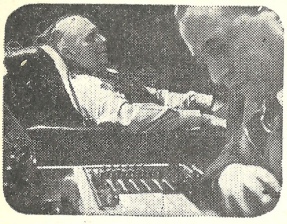

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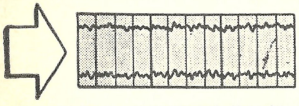

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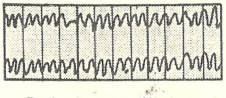
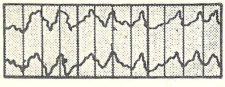


Brain in relaxation.



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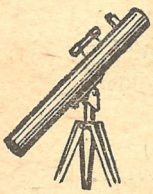

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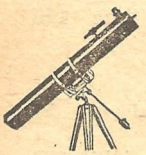

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EDMUND SCIENTIFIC CO., BARRINGTON, N. J.

FUTURE SCIENCE FICTION

No. 37
June,
1958
35¢

● *NOVELET*

● *SHORT STORIES*

● *SPECIAL FEATURES*

● *DEPARTMENTS*

Editor: ROBERT A. W. LOWNDES — DOROTHY B. SEADOR, Asso. Ed.
COVER BY EMSH — illustrations by Emsh and Orban

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TO OUR READERS **This magazine has been STREAMLINED for your convenience. It *contains the same number of pages and words as before,* but you will find that the thinner paper makes it easier to read and handle. We would like to hear from you, telling us whether you approve or disapprove of this change, so won't you please drop us a card? Thank you. *The Editors.***

AUTHOR, AUTHOR!

DAVID GORDON had a rather unique Christmas present, last year. On the night of December 25, 1957, his novelet, "Look Out, Duck!" was presented over the radio on the science fiction show, "Exploring Tomorrow", which is heard Wednesday and Friday evenings at 8:05 PM over station WOR, here in the East. Your votes showed that you enjoyed his "Bird in the Hand", in our February issue, as you'll see in "The Reckoning", this time.

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ISAAC ASIMOV has been appearing frequently in the last year in many serious scientifically-minded magazines, with articles on science fiction and science. We hope you saw him on John Winslow's TV show, where Dr. Asimov ably presented the case for science fiction and science-fiction readers. We think you'll find this new series quite unique.

When a civilization reaches the proportions of a Galactic Empire, it's going to take more than just faster-than-light spaceships and instantaneous communications to make it function. Not even the combined forces of the Galactic Navy and the Interstellar Police can beat this unseen enemy, because of their Intelligence Quotient ... and therein lies a double pun...

INTELLIGENCE QUOTIENT

by David Gordon

illustrated by EMSH

SPACE ADMIRAL BALDRICK woke up with a headache, but he was getting used to that, after five weeks of not having enough sleep. The tingler on his Personal robot shut off, and the Personal said: "I'm awakening you as ordered, my Lord, but I shouldn't have; your respiration is not in accord..."

"Shut up," snapped Baldrick. "I'm in no mood for

Her Imperial Magnificence's bright, green eyes blazed, and her anger seemed to fill the room.

stupid conversations this time of day, much less logical ones."

"...heartbeat. *Click.*" finished the Personal.

"Lay out my iridescent dress uniform," said the Admiral. "I'll have two minutes to shower. Don't let me go to sleep in the bathroom."

The Personal had no intention of letting Admiral Baldrick sleep. With a part of its robotic mind, it put together a new suit of dress iridescents, complete with Space Admiral's insignia, gold trim, and light blue cloak. With another part of its mind, it controlled the machines in the bath which massaged, prodded, poked, scrubbed, doused, rubbed, and dried the Admiral's body. As an afterthought, the Personal surreptitiously shotgunned a painless blast of spray through the Admiral's skin and dosed him with vivanol—a drug which the Admiral did not approve of, but which he nonetheless needed in order to stay awake and clear-headed.

The first time the Personal had given the Admiral a shot of the stuff, it had been done openly. Baldrick, in a high dudgeon, had told the Personal that vivanol was for weaklings. "And don't let me catch you giving me a shot again!" the Admiral had ended up.

The Personal obeyed, of course, as a good robot should; so far, the Admiral hadn't caught him.

BY THE TIME he was dressed in his iridescents, Space Admiral Bil Baldrick felt fine. He stood in front of his mirror and carefully brushed the gray-silver hair back from his strong, handsome face. As he moved, the color of his uniform seemed to flicker; it changed from a maroon to a brick red, to a rusty tan, to an orange red, and back again as the light moved over it. He hadn't worn iridescents in years, but this meeting was important enough for full dress. He grinned at himself.

"Fighting a diplomatic war takes a uniform," he said. "And the gaudier it is, the more impressive—and therefore the better weapon it is."

"Yes, My Lord," said the Personal noncommittally. Then it said, "Are you ready for the news?"

The Admiral sat down at a table. His face had lost the touch of humor it had had. A steaming cup slid out of the wall, and the Admiral started sipping at the hot, dark liquid. "Go ahead," he said, "give it to me."

ALL DURING the hours the Admiral had slept, the Personal had been receiving information on a special series of ultra-secret channels —coded information, secret intelligence from the vast interstellar network of the Galactic Navy. Now, having digested out the vitamins, as it

were, and filed away the rest, it was ready to report.

"Dating from the first engagement, the War has been going on for thirty-six days, seven hours, Galactic Standard. The losses to date have been four thousand two hundred eighteen major ships of the line, and nine thousand eight hundred fifty-six minor vessels, or an average of point one one two ships for every planet of the Civilized Galaxy."

"That's *known* information," said Admiral Baldrick. "What is your extrapolation of unknown, unreported, and otherwise missing ships?"

"The data is about ninety-seven percent accurate, my Lord," said the Personal. "I have already calculated in the maximum probable error." After a pause, the Personal continued: "Thus far, there have been only minor skirmishes, but if the curve continues as it has, there will be a major battle within four days."

"You said 'ten days' yesterday," the Admiral pointed out.

"I know," said the Personal, "but the c u r v e has changed."

"And if the curve keeps changing that way?"

The Personal paused. If it had been human, it would have sighed. "Tomorow," it said finally. "Tomorow we'll have the biggest interstellar battle the Galaxy has ever known."

Space Admiral Baldrick closed his eyes. "Tomorrow. That's very little time." Then he stood up decisively, his hard eyes narrowing in determination. "This will have to be settled, one way or another. I'm going to tell the Police—and if that doesn't work, I'm going to ask the Empress to tell the people that there's a war on!"

INTERSTELLAR WAR! The concept, even to those highly-placed officers of the Galactic Empire who conducted the war, was too big to grasp, too immense to imagine. It covers too much space and too many numbers of ships. Grand strategy can be plotted out, but it can never be up-to-date. The Admiralty of the Galactic Navy felt, collectively, like a single man trying to play a thousand chess games at once, with the additional complication that the enemy was allowed to make as many moves as he could before he was interrupted. And there was one other trouble: Nobody knew who the enemy was!

Assistant-Admiral Vaniss, also wearing his dress uniform, waited for Space Admiral Baldrick in the tower of the Admiralty Building and pondered deeply on the problem of conquering an unknown, powerful enemy with an unwieldy weapon like the Galactic Navy. He looked out of a broad window at the blue, cloudless sky of Pride-

hold IV, as if trying to pierce beyond the blue to the vast blackness of space, thinking about the problem.

"Dammit! It can't be done!" he said at last.

"What can't be done, Van?" said Admiral Baldrick, who had come up behind him.

Assistant-Admiral Vaniss whirled in surprise, gulped, saluted, grinned weakly, and said: "I don't think we can win the War, my Lord Admiral."

"I'll admit that it doesn't look as though we can, so far," Baldrick said. "But why can't we eventually gain an advantage?"

VANISS glanced at the floor and then looked back at his superior. "They have every advantage, Admiral. They know the location of our bases; we know nothing about theirs. They have attacked us on our own home grounds, and we don't even know where they come from. They know what sort of life-form we are, and we have never even seen one of them. They've got us, Admiral, unless we have luck and God both on our side."

Inwardly, Baldrick felt like agreeing, but he said: "It's not as bad as it seems, Van; so far, at least, we seem to have destroyed as many of the enemy ships as they have of ours. If the Galactic Navy can hold them to a stalemate, then with the aid of the Interstellar Police, we should be able to wipe them out."

"*If* the Empress approves," said Vaniss. "After all, sir, this isn't a problem of Police jurisdiction; it's strictly Navy."

Baldrick laughed—sharply and without mirth. "Is that the legal mind speaking, Vaniss, or just Naval pride?"

Vaniss stiffened. "Both, perhaps, my Lord. I must admit that I feel like a fool, having to ask the Interstellar Police for help."

"Hah!" Baldrick made the sound a sharp explosive one. "I'm the one who has to do the asking, remember! Now, let's get on with it; the meeting's in one hour."

FIVE MEN sat at the huge table. Three of them wore the uniform of the Galactic Navy, two of them were clad in the pure, almost fluorescent, white of the Interstellar Police. It was not an ordinary meeting; these men were not just sailors and cops. The gold and white and blue on the uniforms of the Naval officers and the violet-lined cloaks of the Police fairly shouted: "Top brass!" Nor was it a social meeting; this room was the Directive Center for the Galactic Navy, a room designed strictly for business. Here were the controls for the vast communication web that held together, however weakly, the monstrous fleet of the Navy.

The men sat so they could

see each other. To Space Admiral Baldrick's left, in resplendent white, sat Colonel-General Cramm, jowled, balding, and heavy-set. Next to him sat Assistant-Admiral Vaniss, with a slight scowl on his bulldog face. Beside Vaniss was Deputy-Admiral Grainer, looking rather at ease, as though he felt quite superior to the Police officers, but was being as full of *noblesse oblige* as possible. The last man was Captain-General Smed a Police officer with dark eyes, set deep in a square, muscular face.

"Gentlemen," said Space Admiral Baldrick, rising, "it is time to begin."

THE OTHERS rose and all of them faced the Imperial Communicator that glittered in the center of the ceiling. Every important room in the Galaxy held one of those devices. In some rooms they were easily visible—in others, they were hidden. Since the Empress could, at any time, see and hear through those devices, they were always treated with respect, as though Her Imperial Grandeur, The Magnificent Empress Lurissa, were actually watching at all times—although the odds were several billion to one against any particular communicator ever being used at all.

"Your Magnificence," said Baldrick, "with your Imperial permission, we shall proceed."

They paused for a moment, then sat down, taking silence for permission. Only very rarely was there ever an answer.

Space Admiral Baldrick cleared his throat in the time-honored manner, and said: "Well, gentlemen, suppose we begin."

The two Police officers looked at each other, then nodded at the Admiral in consent. One might almost have assumed that they had only made up their minds to listen to Baldrick at the last minute. Diplomatics is a subtle science.

"Very well, M'Lud Admiral," said Colonel-General Cramm, "let us suppose."

"Consider it supposed," said Major-General Smed, his deep-set eyes looking suspicious.

"Supposition moved and carried," Deputy-Admiral Granier intoned in a bored voice. "Meeting will continue."

BALDRICK leaned back in his chair, trying to look suave and somewhat *blase*—and succeeding very well. "My Lords General," he said smoothly, "we have, I'm afraid, a bit of a problem. The Empire—that is to say, the the Navy—is at war."

Cramm and Smed exchanged looks again, and Cramm looked at Baldrick. "War, M'Lud?" He sounded interested, but not shocked.

"Precisely, My Lord," said

Baldrick. He was a little downhearted in not having gotten the response he'd wanted.

However, he thought, *carry on!*

"In order," he continued, "that you may understand our position, I shall outline the incidents which have brought us to our—ah—rather unusual position." He steepled his fingers judicially.

"For the past two years, our Intelligence Service has been sending us reports of a most peculiar nature. At first, they m e a n t nothing—just scattered reports of irregularities here and there. No one report, I might say, disclosed anything at all of a suspicious nature. But the Naval Intelligence Service, scattered throughout the Galaxy, consists of several billion operatives, and their reports, when broken down mathematically and subjected to analysis, showed a somewhat frightening picture." He paused to let the words sink in, then said: "We found that throughout the Galaxy there is spread an alien spy network of tremendous scope and complexity!"

He waited for effect. There was none.

HE STARTED to go on, but C o l o n e l-General Cramm raised a finger for attention. Baldrick nodded in acquiescence.

"M'Lud A d m i r a l," said Cramm ponderously, "I'm well aware of the effort you are putting forth to undergo this—uh—sort of thing. It—uh—almost borders on humiliation. You are, I think, considering of asking us, the Police, for help."

"Well..." said Baldrick.

"No, no," Cramm said, waving a hand, "don't go on just yet; permit me to relieve your feelings at once. When you asked for this conference, we, too, had reached the point of wanting to ask for help. You see, our own Intelligence network uncovered that same group of alien spies!"

Baldrick exhaled slowly. "I see," he said at last. "Then may I presume that your own forces have also been battling them?"

"We have," said Captain-General Smed flatly.

Baldrick sighed. "That puts a different light on things, doesn't it? Traditionally, the Police and the Navy have had exclusively separate spheres of action. The Navy's job has been the control of interstellar commerce, whilst that of the Police has been the control of planetary crime. It seems that our spheres of action have suddenly overlapped."

"Not suddenly, M'Lud," said Colonel-General Cramm. "This has been building up for years. Only recently has enough data become available for us to act upon it." He paused, c o n s i d e r i n g his words, then asked hesitantly: "Would you tell me frankly,

M'Lud Admiral—have you discovered the identity of the enemy?"

Baldrick glanced at Assistant-Admiral Vaniss. "Van?"

VANISS licked his lips. "Frankly, My Lords General," he said, addressing both Police officers, "we have not. Since the outbreak of actual hostilities, their spy network has almost vanished into empty space, and we have been unable to capture a single one of their ships or take a single prisoner. We know nothing whatever about them, and any assistance you might give..."

"Tell them, Smed," said Colonel-General Cramm.

Captain-General Smed's deep eyes seemed to grow deeper. "They're like snakes," he said. "They have slithered off into dark corners where they can't be found. They pulled in their horns not long after we discovered their existence. We had pinpointed more than thirteen thousand different planets where they were almost blatantly active. Then, quite suddenly, they disappeared—as M'Lud General Vaniss said—into empty space. Within two days, actual hostilities broke out."

Baldrick nodded. "That was our experience exactly. And since our first encounter in space, we have had to throw more and more forces into the war. Tell me, My Lord General, have you thought of telling the populace?"

Cramm coughed slightly. "To be frank, M'Lud Admiral, we have. Normally, of course, we would never consider making Police activities public. When we run into trouble, we gather our forces, wade in, and wipe it out without disturbing the people of the Galaxy. After all, our job is to *keep* the peace, not destroy it by upsetting the public. And..." He waved a hand. "...I'm certain that's *your* way, also. But—well, this thing has become rather too much to handle alone. The invading fleet seems to be vast beyond anything that we've ever tackled before. At first, I'll admit, we considered it a simple criminal conspiracy. But it's obviously much greater than that."

DEPUTY-Admiral Grainer, no longer smiling his tolerant smile, raised a finger. Baldrick nodded.

"My Lords," he said, "has any of you considered that this might possibly be an uprising of some secret group against the rule of the Empress Herself?"

There was an intake of breath around the table. Then Captain-General Smed said: "If M'Luds Admiral will permit, I'd like to say that I, too, have considered that possibility. But since the last Galactic Census—having only been begun some two hundred years ago—is not complete yet, it is difficult to tell exactly what the feeling of the public is. And we have not,

of course, made general public opinion a part of our own Intelligence S u r v e y. We leave that up to the Political Corps. However, much as I dislike doing it, I think perhaps we might ask the Political Corps what their findings are." Then Smed looked straight at Deputy-Admiral Grainer. "Am I right in assuming, M'Lud, that you have found these invaders—or insurrectionists—to be human?"

Grainer nodded slowly. "They are either human or else they are a form of life which can successfully imitate humans. We have found not the slightest trace of any non-human activity."

Baldrick, a s s e r t i n g his chairmanship, said: "There is, I think, one other possibility. Suppose we are confronted with the type of alien which has often been theorized by our psychologists—that is, a life-form which can take over and control the minds of human beings. If so..."

SPACE ADMIRAL BALDRICK was interrupted by the sudden sound of a chime—a sweet, clear sound, as though made by a bell of clearest crystal.

Every man at the table stood erect, snapped to attention, and focused his gaze on the Imperial Communicator in the ceiling. It was glowing, surrounded by a cloud of white light.

A voice said: "Her Imperial Magnificence wishes to speak to the Lords Admiral and General of Her Magnificence's Forces."

There was a pause while the cloud of white around the Communicator s l o w l y coalesced and gained color. It became a three-dimensional reproduction of the beautiful face of Her Imperial Magnificence, the Express Lurissa. Her red hair shone with the care of the best hairdressers, and her green eyes glowed with something undefinable.

"You may be seated, Noble Officers," she said, in a clear, ringing contralto.

The officers sat.

"This won't take long," she continued. "I have received from both the Navy and the Police requests that I be notified of the existence of a vast, Galaxy-wide war which has been waged within my domain—heretofore without my knowledge. My Political Corps has also notified me of a tremendous network of secret, underground espionage agents existing throughout the Galaxy."

She smiled, but there was something in her smile that Space Admiral Baldrick definitely did not like.

"Nobles," she said smoothly, "I realize that running an organization as vast and complex as the Civilized Galaxy is no easy job. But do you realize how much time, energy, and money you have wasted—thrown away—on this stupid war? Do you realize what damage and destruction

you have wreaked in your bumbling endeavors?"

SPACE ADMIRAL BALDRICK stood up. "If your Magnificence will permit, I should like to point out that, had it not been for the efforts of the Navy—*and* the Police, we might already have been taken over by these invaders. I realize that the cost, to date, has been great, but I feel that it has been justified."

He stood rigid, realizing that, in speaking in his own defense, he had been guilty of breach of conduct.

The change that came over the Imperial visage was astonishing. Her bright green eyes blazed suddenly, and her anger seemed to fill the room.

"Justified?" Her angry voice rose in volume, and the Lords Admiral and General quivered inside. Baldrick, still standing, felt a sudden nervous tension over his body, like that of an execution beam striking the base of his skull.

Her Magnificence's voice became quieter, but there was still suppressed anger in her throaty tones.

"Police Intelligence has discovered the existence of Naval Intelligence. Naval Intelligence has found that Police Intelligence exists. Pah!" Her voice became high, harsh, and angry again.

"You blithering idiots! You feeble-minded, subhuman, bubble-brained, blot-headed, stupid sons of space rats! Don't you realize that for the past five weeks you have wasted the Galaxy's substance in the greatest war the human race has ever seen? In the name of humanity, call off your fleets before they do any more damage! *You've been fighting each other!"*

Space Admiral Baldrick sat down. "Yes, Ma'am," he said.

★

The astute punster has already seen that the word "intelligence" can be taken in two ways, in the title of this story. But did you also notice that "quotient" is the answer you get when something is divided?

Novelet

CARGO: DEATH!

by T. H. Mathieu

A pair of rabbits once got loose in Australia, and nearly wrecked a continent. And now, if this solitary mouse-like creature got loose on Earth, it would be far worse than the Australian rabbit situation. Rabbits don't bite people; this mouse-animal did. And its bite was fatal in twenty seconds...

"ALL RIGHT, let's face it: the damned thing is dangerous—deadly." Wiggins began the meeting that way, informally, startlingly; it was his manner.

The words evoked a graphic picture in Art Hamilton's mind, for he'd been there when Belcher got it.

It was no fun watching a man die, a man in pain. Sure, the Survey made no bones about it; when they signed you up they informed you of the hazards. But this was different—this was reality.

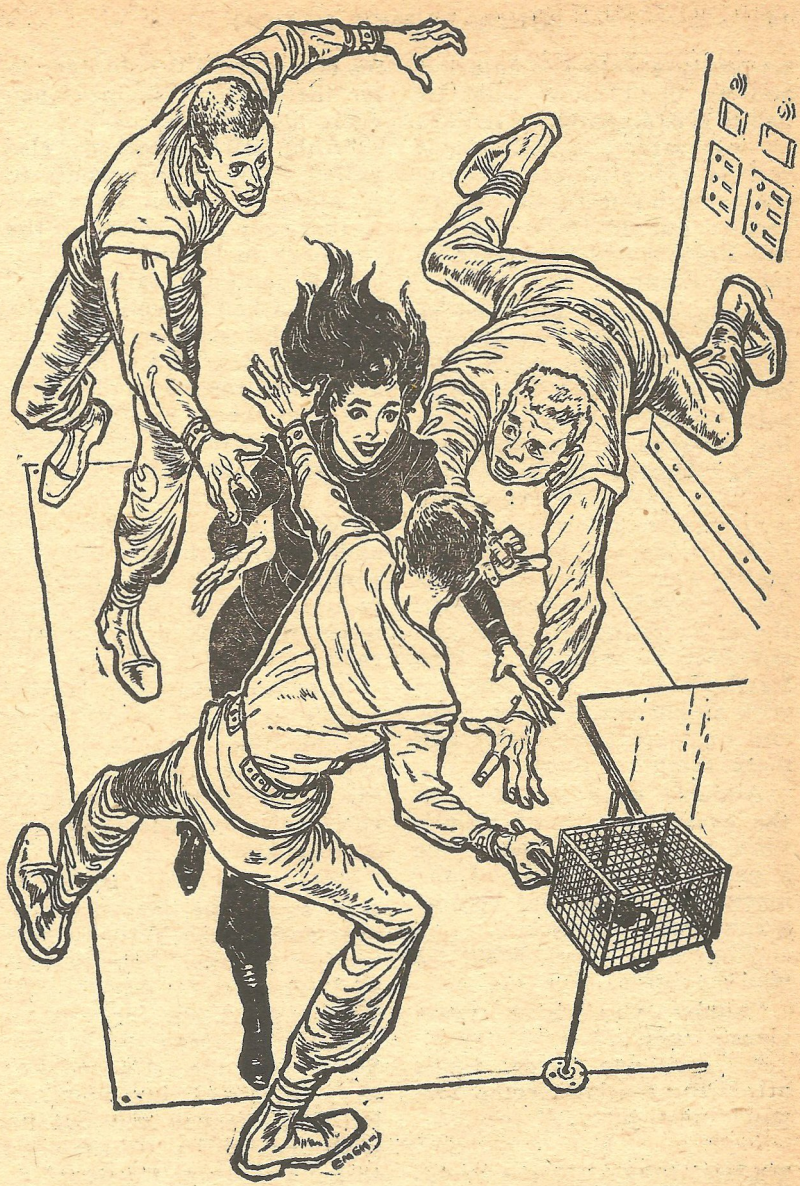
First there'd been the startled recognition. "Hey, the little thing bites," Belcher said. And then the amused defensive reaction to cover fear: "Got a nasty little nip," he'd grinned ruefully. Then the open fear as he realized something was seriously wrong. "It hurts... bad."

Swiftly came the sweating, the paroxysm of pain, the dawning recognition of death.

Lastly—death itself. Irreversible, final, complete in a little over twenty seconds.

The pattern left its mark on him. Wong, they could all be intellectual about; nobody had seen it—they'd just found him, countenance drawn, lying face down in the brush. But Belcher—Hamilton would never forget Zach Belcher.

WIGGINS continued: "It's our fault, the ecologists tell me. We've settled the coastal areas of this planet, and our little friends aren't coastal dwellers. So we come across a new life form when



The three men jumped Beverlee before her hand could touch the harmless-looking animal.--

we venture into the interior, and we don't know what its habits are. Apparently it likes us—or, rather, our food; it thrives where we are. Result: increased numbers. Secondary result: our interests clash—and Belcher and Wong are no longer living."

Wiggins' eyes glittered as he looked at the men seated around the rough table. The harsh glare of the Coleman solar-powered lantern, hanging overhead from the tent pole, reflected the annoyance in his eyes. "Temporarily we'll have to retreat—but not, I hope, for too long. We're taking steps." He nodded his head toward Hamilton, "Art, there, is going to take the specimen he captured back to Earth and try to come up with an answer. The facilities and equipment are better and more complete there."

Amiable envy appeared in the eyes and talk of Hamilton's companions. There was a pause in the tempo of the meeting, a pause that became a conversational hum.

"Earth! Boy what I wouldn't give..."

"Lucky you. Five years since I was..."

"...just one favor, that's all. Bring me back some kreplach soup, just..."

DICK ROYALE, the geologist and Hamilton's longtime friend, leaned over from the right and said, "Hey, Dad! Need an assistant? Take me along and I'll volunteer to let the critter bite me—once we're home."

"Ahh, hell!" somebody else yelled, "Royale just wants to go along so he can make love to that sexy stewardess on the run back to Earth."

"OK you guys, calm down!" Wiggins had to yell to make himself heard; then there was sudden quiet. "Both Royale's and Hamilton's glands aside, we have been hired by the Survey to do a job. Settle down; we have planning to do.

"We'll pull up stakes here and move. Perhaps our nasty companions are only local in nature. About a thousand miles north is a large lake that..."

But Art Hamilton really wasn't listening. It had been six months since he'd seen any civilization. He shook his head, grimacing, remembering the hangover he'd had in City One.

Somehow, after interminable ages, the meeting was over and Enoch Wiggins was talking to him. "I've contacted Headquarters, Art. They'll send a plane out for you tomorrow; you can leave then. Sorry it's the *Alexandrite;* she's old and inconvenient, but I guess you can put up with her. Will you have time to get your gear together?

Hamilton saw the faint smile around the other's mouth. "Yes, Doc, I think so," he said gravely.

"He thinks so! Get him!" Royale interjected, pointing a lean forefinger at his pal. "He'll work all night if he has to, and if he runs out of time, the swine'll leave the rest for me." But his smile told the others Royale's speech was banter, and it removed any possibility of sting.

WIGGINS' DEMEANOR changed; he became serious. "All right, at the risk of boring you, I'll repeat so you won't forget how important this is. First, get the beast home. Next, find some quick, inexpensive way of eradicating them. Maybe it'll be a chemical poison; I'd prefer it to be something bacteriological—start a plague among 'em. But it has to be something, and soon: we have to make this area fit for human colonization. Meanwhile, I'm turning in. G'night men." And he strode off, accompanied by Hamilton's wave and Royale's automatic, "Night, Doc."

The two men walked toward their tent.

"Still envy you, Art—and particularly that trip home with Beverlee. She's quite a gal."

"She sure is!" Hamilton's vehemence startled his companion.

"Whoa, Dad—how serious are you?"

"Enough, son, to warn you to keep your lecherous fingers to yourself. Don't even think what you've been thinking."

There was a serious undertone to it, so much so that Royale stopped and put a hand on Hamilton's shoulder. "Let's understand each other, Dad. You know me—*anything* pretty and I go agog. But satisfying my basic drives"—he stopped, rolled his eyes heavenward, interjected "Good God, Royale! You're talking dainty tonight!" and went on with the original thread—"satisfying my basic drives is one thing, and permanently hooking up is another."

"Is there anything wrong with my marrying her?"

"He voluntarily asks for penal servitude in this year of our Lord 2106 and then asks if there's anything wrong! O.K., Art, in the first place, that's a might popular young lady. You would be surprised at the number of rich and important guys that she meets on that run."

Royale brushed aside Hamilton's objection even before he made it, "Yeah, I know, money won't buy everything. Money won't buy poverty—but remember, you are nothing but a minor government worker.

"And maybe more important is that guys with our jobs shouldn't marry. We wander too much, are in the field too much. What kind of a life is that to offer a woman? Most baby machines want stability

—a settled home, a place to get production underway."

Hamilton said nothing, and the geologist noted the stubborn set of his lips. He smiled, stuck out a hand, and said, "Good luck, Dad! Hope you get what you want."

"Thanks." Hamilton relaxed. "Come on, let's get to packing."

II

"POSSIBLY may not be important at all, Mrs. Winters," he concluded. Captain Stevenson glowered down at the woman from his six-foot-three frame. His sideburns were completely gray; his hair had a sprinkling of pepper; and one of the reasons he would never rise higher than merchant marine captain was the brusque manner he exhibited toward his passengers—particularly the hefty, middle-aged, overdressed females. "But even if it isn't important," he continued sternly, "I'm afraid there's not much I can do. We have around space ports a little thing called 'Traffic Control,' and when Control tells me *'Hold the ship!'*, I hold the ship."

She turned a frosty shoulder and said, "Captain, I remind you that we are due in New York at 1820. We're past departure time, it's 1615, and you have some 683 light years"—she paused, and her eyes assumed the fanatic look given to a member of the laity who carefully memorizes a fact with which to confound the expert; then she continued triumphantly—"to go. I would suggest that we get underway. My relatives are to meet me, and they are"—again a pause, and triumphant look —"*very* influential in this company."

"I'M VERY much afraid, Madam, that we are going to be late." Stevenson kept careful control of his voice and temper, congratulating himself for so doing. The silly woman apparently paid no heed to what he'd just said. "This is backwoods country—this planet has not yet been officially named, it is that new to us—and we help each other as much as possible. There won't be another ship out of here for at least a month. Something important enough has happened to cause a request for a departure delay; I can't very well refuse, even legally..."

Stevenson broke off as the young man swung through the lock entry, greeted the stewardess with an effusive kiss on the cheek, waved to the bartender, who called the traditional "Glad to have you aboard," and began to approach. The Captain mumbled his excuses and went to him.

"Art! Art Hamilton!" The exclamation was made with pleasure as the two shook hands. "It must be six months

or better since they rolled us out of that bar in City One." A gleam came into his eyes, and he added, "God, the Survey must be hard up for bigwigs if it is sending *you* back to Earth!"

Hamilton smiled at him. "Hiya, Steve. And no, I'm going back because this is my baby." Gently he lifted his left hand and showed Stevenson the covered cage, about one and a half cubic feet, that he was carrying.

"That's what the delay was for?"

"Very definitely," replied the younger man, "I have some work on this at home. But first I have to *get* home." He broke off, s m i l i n g l y looked around the ship, and went on, "Haven't they retired this old gal yet, Steve? Thought they were going to do it some time back."

"YEAH." Stevenson uttered the word bitterly. "Each time they're going to decommission, and each time some other emergency comes up. Each time I have to pray a little harder. I guess we all have troubles, and it is"—he glanced at his watch—"now 1619. I have to have this tub in New York in two hours." He lowered his voice, hid with his body a hooked thumb pointed toward Mrs. Winters, and went on, "See, I have another old tub which is complaining."

Hamilton shook his head. "You haven't changed any, Steve." Then he glanced at the stewardess who had moved up to join them. He swallowed hard and added, "And you haven't changed, either, Beverlee Floyd."

Neither of them heard Stevenson stomp off as she gazed at him with cocked head. "Looks to me as though there are a few more crows feet around those eyes, Art."

"That's from squinting into the sun, hoping to see you from afar." Hamilton glanced at the girl's bright auburn hair; her just-over five-foot figure that had curves in the right places, curves which her uniform tried vainly to hide and failing, caressingly surrendered to. He wet his lips, ran the back of a clenched fist over his forehead, slowly as though reciting a catechism began, "I have been out in the field for six months."

SHE HALF-GRINNED. "You didn't have to say that. You didn't have to say that this whole flight. If I didn't know you, and didn't know where you were, you *still* wouldn't have had to say that: it stands out all over you."

"When are we setting the wedding date?"

"You know, I suspect you of asking all the stewardesses on this run that same question."

"You do me an injustice.

Kidding or otherwise, drunk and sober, you're the only one I've ever asked."

Lightly she laid her hand on his arm and said, "I know, Art. I believe you. Just say that it's me. I don't think I want to get married; at least, not right now..."

She was interrupted by a plain-looking, small woman. "Pardon me, miss. This is my first trans-continuum flight in ten years, and I'm feeling a little upset. Have you a foramine?"

"Certainly, Mrs. Drake," answered the stewardess. Then she said aside to Art Hamilton, "You'd better strap yourself into your acceleration couch; we're due to take off shortly." She left to get the pill which would help the woman's space sickness.

Art Hamilton went to the couch which Beverlee had pointed out, and flinched. His across-the-aisle travelling companions were a young mother and her small son, whose age he estimated at about three.

That's just dandy! he thought. Hamilton had travelled with children before and expected trouble.

HE PUT THE annoyance out of his mind; he had to take care of his own companion. Beside his couch, attached to the wall of the ship, were straps which passengers were to use for the belongings they carried with them—articles which were not placed in the storage compartment. Gently he eased the cage into the woven network seat. Stevenson's voice issued from the loudspeaker, "Please get into your couches. Takeoff in two minutes," but he ignored it. He was too busy working on the cage; too busy cinching straps; too busy checking and double checking their strength to hear. He was even too busy to be upset at the child's repeated, "Want to watch man, Mommy," and the mother's embarrassed admonition, "Hush, Dana!"

It was only after he was satisfied was he aware of Beverlee's shout over the noise of the warming motors, "Get *into* that couch—please—you're delaying things!"

He allowed himself to look chastised as he settled into the foam rubber padding. The girl fussed over his straps, saying, "I've seen children who were more subtle in birds for attention!"

"Sure," he replied, "but they hadn't been out in the..."

She put a hand over his mouth. "You could run that into the ground," she said and left.

He relaxed then, feeling the thrum of the motors, looking at the passengers and really seeing for the first time the mother and her child.

It came as a pleasant shock.

The mother was handsome with all the desirable feminine attributes, and the child! He was aware of a strange tropism. It is this, probably more than the sex drive, he thought, which assures racial continuation.

The lad was tow-headed, with crinkly, curly hair, pink cheeks, and a pixie grin. Art Hamilton grinned back idiotically.

. . .

WITH AN effort, he forced himself to think of home.

"Fifteen seconds!" blared the loudspeaker.

...I wonder if they were able to catch Morgan's cancer in time. Imagine, somone actually threatened with death over cancer. Almost a forgotten disease. Guess the doctors had trouble diagnosing it. Good man, that Morgan. Taught me an awful lot about taxonomy. He was even responsible for me getting this job...

"Ten seconds!"

...Look at that cage strapped there. Hope it takes this trip all right. Guess I shouldn't like it, but what's in there is responsible for me going home. What do I mean, "Guess?...

"Eight!"

...Nasty little beast. Could ruin all our hopes for this planet. Do you realize that little thing could do that? Could keep Man—capital Man —right off this hunk of matter...

"Six!"

...The Monster. The Survey ought to know better; it should name planets as soon as possible, not wait so long. The Monster. That's what the colonists have dubbed it. And now The Monster has a monster. Just a little monster, but...

"Four!"

...Let's see: we've been on The Monster for some 20 years now. We've established five cities...

"Three!"

...and have a population of 50,000. That doesn't include the estimated 75,000 natives. Sounds like a lot, but actually we've only settled a few coastal areas. A perfect Earth planet, rating double-A...

"Two!"

...and here comes a little monster which might drive us off. Why did it take so long for organized expeditions to get into the interiors? The Survey is doing things all wrong. And how about the nice people who are settled? The ones like Mrs. Drake?...

"One!"

...Where is that good pioneer stock going to go? Uprooting after ten or fifteen years, all because of you in that cage. You son of a...

The sudden shock of acceleration pushed him down into the couch with a grip more firm and far less gentle than Beverlee's.

III

IT WAS energy that gave humans the Universe. Boundless energy: energy to power ships which travelled through space. Energy to *move* ships—and note the distinction here. "Move" and not "fly," and "move" is about as close as you can come to describing it—through a ruptured space-time continuum. Energy to move from the region of Sol to, say, Sirius or Aldebaran or any of the unnamed receding stars at a theoretical time measurement of "zero."

No one, as yet, fully understood hyperspace; it was know empirically that, plotted as time against distance, the curve was asymptotic approaching zero, with maximum time something on the order of five minutes at distance googol or thereabouts. Hyperspace was not simply an upward extension of the physical universe, so that Einsteinian law held but was merely modified. It was not, for instance, simply a "place" where the limiting speed of light might be a million miles per second so that ships could travel at that speed, exceeding this Universe's 186,000 miles per second, and thereby getting where they were going in a hurry.

Hyperspace was a horrible philosophical concept come true, wherein our "time" became motion and its axis shortened until it blended with, at right angles to, our three physical dimensions; and "time" in hyperspace was foreshortened to duration and existed for roughly five of our minutes. Hyperspace was a ghastly physical concept come true with three and a half dimensions!

It was energy that did the job. Energy, and something else: Torps. Torps, short for Torpedoes, short for Toroidal Pedometers. Inventions are interlocking: the last in line is based on all that have gone before. The Torps were no exception, for they came along shortly after the discovery of efficient energy release. It was a circular series of conversions, the final isotope before complete disruption being close to the original material. Unfortunately the process was wild, uncontrolled. And it needed the Torps. They accomplished two ends. They were able, on a statistical basis, to determine at what stage the process was, and, in a certain sense, control it. They could, for instance, hold up the process until 38% of mass were in Step 5 rather than 36%. But this was an offshoot: originally the machines were designed simply to indicate at what step in the nearly circular chain things were. Hence the ungainly, palate rattling, but literally true name of Toroidal Pedometer.

SO TORPS and effective, efficient atomic energy gave the people of Earth the Universe. It hadn't begun to be explored, but Earthmen were quick to exploit any advantage. They were spreading out as fast as was possible, limited only by their own fecundity and logistics of the tools of manufacture. And why not? When a man could breakfast on Earth, lunch on the opposite side of the galaxy, and be home for dinner, why shouldn't he reach out for new frontiers? Earth wanted much, was willing to pay for it, and much was for the taking. Fortunes were made by pipsqueaks, malcontents, and even planners, too. Standards of living rose, and so did wages, except, of course, those of civil servants.

Those who wanted a fortune did not join the Planetological Survey; that body settled and studied. The fortune-hunter simply moved on to the next system when he became convinced the present one wasn't productive. Those who wanted adventure did not join. Who did? Those who wanted to classify and map, categorize and march. The ecologists, biologists, taxonomists, geologists—they were the ones who joined. They worked, underpaid, underprivileged, till they sweat blood and bled sweat—and did the job for the next wave.

The backbone of any ethnological expansion is the pioneer-farmer: in pre-history he carried a spear, wore skins, and marched up the Danube valley; historically, he lugged around a muzzle-loader, wore hand-made rough spun clothes, and discovered a continent; now it was a nerve gun; factory-produced, indestructible plasticloth; and apparently an unending source of worlds. But always he had the desire to find for himself that slightly better hunk of ground where he could settle down, live hard but well, and raise his kids in peace. He came on and was grateful to the Survey for those planets already classified. He was grateful for the knowledge of mature soils, water sources, and insect occurrence. Unfortunately, the Survey worked slowly, so that even the farmer struck out on his own. And sometimes, as in the case of the Drakes and Art Hamilton, that wasn't so good.

"CUTE LITTLE beastie. That all you guys on the Survey have to do—run around and cage harmless little pieces of fauna?" The speaker was Charlie Briggs, ship's navigator-engineer. He and Stevenson had gathered around when Art Hamilton came into the control room, carrying the cage. With perhaps an overly-dramatic gesture Hamilton had thrown the cover off and revealed the occupant.

For all the galaxy it looked

like a small mouse. It was some two inches in body length (with an additional three inches of tail), furry, and four-footed. The body was plump-fat and distended. Its color was a light purple. The eyes were large, much larger than its earthly homolog; the mouth was oversized, also. Its ears, more donkey-like than mouse-like, curved down and around the cheeks. It returned their stares with seeming insolence.

"I don't know, Charlie," Stevenson said. "It doesn't look like much to me. Certainly it doesn't look like enough to have delayed this ship. But Art here may know—correct that to *does* know more than we about the critter. And he says it is important."

Hamilton snorted, "You've understated it if anything. Important? Why— Hey! Stop!" He broke off when the engineer put forth a big hand as if to lift the wire, small-mesh container, and he slapped Briggs' hand away with as much force as he could.

"What the..." Briggs began.

"For Lord's sake, move it only by the handle there on top of the cage." Art Hamilton was grim. "Empirically we've found that it only takes about twenty-one seconds for you to go into coma after this baby has bitten. Apparently a neurotoxin."

BOTH THE engineer and captain stepped back from the cage in almost involuntary fashion. "And you brought *that* aboard *my* ship?" Stevenson asked in strangled tones.

"I've got to get it back to Earth for prolonged study. What could I do? I was in such a rush to let you take off; I couldn't take the time to reopen the storage compartment, even if I wanted to. See..."

Hamilton was interrupted by the stewardess' entry into the cabin. "Hi, fellas. Where's this biological bomb dingus of my taxonomist friend?" She spied the animal then, uttered, "Oh, how cute!" and reached for the cage.

What happened next was a bit of action torn out of a three ring circus. Hamilton split down the middle: his left arm grabbed for and caught the cage handle and tried to take the rest of him in one direction; his right arm stretched counter, palm out, in an effort to block the girl's body. Stevenson, meanwhile, had taken her arm and pushed, and she turned with the force. The engineer shouted, "Wait!" and he, too, tried to push her away. But he was a fraction of a second late, lost his footing, and sprawled out.

THE TABLEAU held for an instant: Art Hamilton with the cage held out be-

hind him, as though denying candy to a reaching baby; Briggs sprawled out between him and Beverlee; the girl's shoulder practically under Hamilton's chin while she faced Stevenson. And then she said, "There's an old proverb to the effect of relax and enjoy it, but this is utterly ridiculous!"

And then it broke into little pieces which fluttered around their ears as they all spoke at once. Stevenson said gruffly, "Always some goddamned flip comment you have..."

Hamilton began, "We were just trying to keep you away from this..."

Briggs picked himself up and brushed off his knees. "I'm getting too old for this sort of thing."

"Would someone like to explain?" asked the redhead, adding, after a slight pause, "And this had better be good!"

"Well, Bev," said Hamilton, "it's really pretty simple. That 'cute' little beast is about as deadly as anything we know. Don't expose yourself to it. Don't hold the cage except by its handle: *Pseudomus* may bite right through the mesh."

"Pseudomus?" grunted Stevenson, "So that's its name? *Pseudomus* what?"

In a small voice Hamilton answered, *"Pseudomus floydensis."*

"I'm damned!" muttered Stevenson, catching the implication.

The girl's eyes danced with pleasure. "How sweet of you, Art. You've named him after me."

"It isn't definite yet." He was still embarrassed. "It'll still have to be ruled on by the International Congress, and..."

"Well," interrupted Stevenson, "regardless, you just can't expect a man to go around pronouncing mouthfuls like that. To me it will remain simply 'mouse'."

HAMILTON continued, "Anyway, the customer is bad; killed two men in our party before we realized the danger. I did the work on it and was finally able to trap it. I know, I think, as much about it as anyone."

"But why is it so important?" asked Briggs.

"*Pseudomus* is a lesson in ecology, underlined home to us humans. Our party was one of the first to start exploration away from the coastal areas of The Monster. We went into the interior, camped, began working, and, in so doing, attracted our little purple friend. Apparently they like our food very much. They began to breed like"—he searched for the word, found it, and continued—"mice. They finally became common enough to do damage to us by biting; now the inevitable inter-specific war has begun."

"But Art," Stevenson inter-

jected, "no animal has ever beaten us before."

"Sure, and what was good enough for your grandfather is good enough for you!" Hamilton strode back and forth, expostulating. "You want me to pick out the million and one holes in that statement? In the first place, just because no animal has ever done it before doesn't mean that no animal is capable of doing so. Next, someday we *will* lose to an animal, be it Homo superior or simply some life-form which lives more efficiently than we. Maybe it's in the unexplored regions of space; maybe it hadn't evolved yet; but you can bet your bottom dollar on one thing: Mother Nature has never yet backed one life form to the exclusion of all others.

"And lastly, we've been beaten on a local level lots of times. Could you stand up to a lion? Or a Procyonian skivver? No, but ten men could. It's a question of numbers—and we may not have enough on The Monster to fight on *Pseudomus'* terms."

BRIGGS glanced nervously at the chronometer and said, "1651. I've got to make some log entries." He began to move away, and the others followed suit, with something akin to relief.

Art Hamilton went back to where he'd put down the animal, picked up the cage as though to leave, and stopped. He refused to let them off the hook, but held the animal out to them. "You are still thinking of this as a mouse. That is a mistake, the same mistake we made for a while. Aside from its terrific offensive weapon—its ability to kill swiftly and easily—it has a few other things that scare me. It is smart. I don't mean wild cunning or feral shrewdness or any other qualifying forms of smartness. On a primitive level, it can think. And those teeth—why, metal is the only substance we've found so far that it can't chew through. And to add fuel, take a good long look at the forelimbs."

The three bent closer and stared. Comprehension dawned, even as the animal stared back. The girl said, with indrawn breath, "Opposable. The sixth digit is opposable!"

Hamilton said in a wry voice as he stepped through the door of the control room, "Yeah. See you later."

WHAT SERVED as the bar—the almost closet-like cage towards the rear of the ship—was not crowded; Hamilton sat there, morosely turning the drink in his hand. His mood—the gala, festive, home-coming mood—had changed with his explanation of the mouse's danger to the others. Things looked black.

"Mr. Hamilton?" It was the bartender.

"Yes, John."

"You look terrible, and I hope you'll pardon me for saying so. I've never seen you in such shape."

"I've an awful lot on what is presumed to be my mind. Things like history and humans and survival. Sounds good, huh?" He broke off, grinning, and continued, "You can even throw in manifest destiny, socio-economic masses, and...and..."

"And Beverlee?" added the other.

Art Hamilton nodded, his expression quizzical. "Partly. I always seem to come off second best when I lock horns with her."

"Don't we all." He leaned forward and became intimate. "You'd be surprised at the number of passengers—some important people, too—on this run who've varied all the way from an unsubtle pass to honorable offers in her regard."

Hamilton's mouth turned down at the corners, and he ran his finger across the wet bar, leaving a trail behind it. "Yeah, I've heard this routine before. Well, chalk up another. One slightly tarnished, disillusioned taxonomist to join ravening throng. Honest, capable, intelligent. Object:..." His eyes widened, slowly he put his elbow on the bar and cradled his chin in his palm. "Object: matrimony," he finished, surprised at his intensity.

JOHN NODDED. "I hear it all; I'm the bartender, y'know. There was that geologist, whatzisname? The assistant to the Director of the Survey..." He trailed off when he saw the look in Hamilton's eye and then hurried on, "And even that blonde congresswoman who was investigating..." The look didn't improve. ".. uh, well, I hear it all; I'm the bartender."

His voice lost its conspiratorial air as the object of the conversation approached. "Then do your duty and fix me something," she said.

They sat and looked at each other while John fixed the drink; nothing was said. Art Hamilton's mood hadn't improved with the knowledge that the girl had overheard them talking about her. He wanted to pick her up and shake her. He looked up to see her wink at him, slowly.

"Stevenson is right: you are too goddamned flip!"

"What brought that on? You just weren't being good company, sitting there thinking all by yourself, and I thought I'd liven things up by winking. Didn't think you'd snap my—" She was interrupted by the bartender putting down her drink. "Thanks, Paul."

"Paul?" asked Hamilton. "I thought your name was John."

"It is," he nodded, happy to see the break in the tension,

"John Paul Jones. I was named for some famous ancestor in one of the North American histories."

"Oh? You're of American descent?"

"Yes, I can trace my lineage back for more than three hundred years. But my ancestor didn't have the opportunities I have; I'll make him look like a piker."

HE MOVED away and Beverlee caught the puzzled look in Hamilton's eye. "Didn't you know? All officers on this line have to serve hitches at a spaceman's level. Jones is called a 'ship's aid.' Adds a little dignity."

"Say, that's right. Steve mentioned that he began as a wiper in the engine room on one of the old fashioned big ships."

There was a pause in the conversation. Then Art Hamilton smiled and said, "I shouldn't do this: I should assert my independence; I should let *you* worry, but... Well, I'm sorry I growled at you. Really sorry. I don't see you so often that I can afford to waste time being nasty. Gotta spend it productively. impressing you with me."

"You don't have to do that. Besides, you have a lot on your mind with that beast you're carrying around."

"Wish I could convince you—ahh, L i n n a e u s! I'll make small talk instead. What's the flight plan?"

"I think Skipper's cutting this half short," she replied. "We'll accelerate for 40 minutes, go into hyper for four, and come out about an hour from Earth." Then she added grimly, "That is, if Steve can squeeze enough juice out of this old ship." She sipped her drink, finally said, "Anyway, Art. I've got to get back."

"What's b o t h e r i n g you, Bev?"

"To tell the truth, it's Mrs. Drake. She doesn't look good to me."

"That all? Don't worry about her; she's good pioneer stock. It's a touch of space sickness. Bet she outlasts us all."

"Still..." She stood up, "I'd better go. Thanks for the drink." She winked again, smiled, and entered the main portion of the cabin.

HAMILTON was about to leave when the ship's intercom warmed up with the usual rumble. Then it said, "This is the Captain speaking. In a moment or two we will enter hyperspace. I have turned on the distance viewscreens, and you may watch the transition. You are among the relatively few people who can say they've actually seen this effect first hand; consider yourselves lucky. Even we in the service never get used to the sight. If you wish to speculate upon the causes of what you are about to see, bear in mind that it is related

to the optic nerve and the inability of the mind to comprehend what it observes. It is now 1702. We go in in one minute."

Art Hamilton stayed at the bar, watching the screens up ahead. He saw the usual assortment of stars; the crazy yellow holes in the sky behind which the gods frolicked; the truly random pattern of atomic furnaces that radiated life to the planets around them. It was a sight which, though beautiful, anyone could, and usually did, get used to. It was the hyperspace effect that he loved to see. Perhaps it was because of its brevity; after all, no one had any reason to stay in hyper longer than five minutes. In a civilization based on scientific materialism—translated into terms of "efficiency"—no one *dared* stay there longer than five minutes; it was wasteful of energy. And even in a society where energy could be wasted, this was a sin.

More probably, he decided, it was the positive aspects of beauty rather than the relatively negative one of brevity. For the sight he was about to see was beautiful, he knew from experience. So he relaxed and waited.

THERE WAS no physiological effect attendant upon "going in." In a completely closed system, the chances are that the passengers wouldn't even know that the transition had taken place. But Stevenson, with fine showmanship and a sense of the dramatic, cut the interior lights and let the viewscreens glow brightly attracting all attention.

On the screens the transition was abrupt: there had been stars—yellow, blue, red, and white. The color differences were, as in any sky, not too marked. Suddenly they shifted position and adopted motion; they moved, as units around the screen. A second component of motion became evident. It was more subtle and not as fast. The hyperspacial star equivalents had interior movement that affected the exterior shapes. They became amoeba-like, but with one important difference: their shapes were more angular, with far fewer curves. Sinuousness developed, but only long enough to evolve into geometric form. They could better be described, perhaps, by the phrase "kaleidoscopic units" rather than "amoeba-like." Both motions were affluent, smooth, and continuous.

THE SIGHT of such motion would, by itself, be recompense for entering hyperspace; however, a dimension of color was added—a variable dimension, wherein no color remained for more than fleeting seconds. Some of the colors were actually

impossible to name, for they'd never been seen before. Some were p a s t e l s, some deep shades. And none of these colors were produced by man, so none were forced to fit into an arbitrary pattern. Deep greens s u r r o u n d e d, shared, and streamed through ultramarines; pinks and purples flirted with one another and then played tag with mauves.

Not all the effects were beautiful—particularly in the major direction of movement, when the colors would begin to pile upon each other until the result was a bilious grey-green flecked with spots of pale red. These were relatively rare and could not detract from the overall picture.

It was, as Art Hamilton was smugly fond of telling himself, a perfect ballet of motion and color and form. It was uninhibited and abstract; it was what artists had for hundreds of years attempted to put on canvas and had failed. It was the epitomic blend of sex and spiritualism and thereby appealed to all watchers. It held them all, relentlessly spellbinding.

He sat there, hardly breathing, watching; and he was suddenly aware that something was awfully, awfully wrong. That he had time to notice. The all too sudden drop-down on the screens indicating that they were again in normal space. That, too, he had time to notice. And the fact that he was flying head over heels through the cabin: that finally he had time to notice. He was unconscious before he could be aware of the screams and sound of w r e c k a g e w h i c h rang throughout the ship.

IV

FOR A SPLIT second before full consciousness returned, little black, sharply-defined waves —like those in a child's drawing of the sea—paraded before his eyes. It was actually a preconscious state and led into a drowsy awareness. Hamilton opened his eyes to see the stewardess kneeling over him. She was applying a compress to his forehead, and she said in low, controlled tones, "You're all right, you know. Just lie still for a moment; there may be some shock."

Things snapped into place then, and he came fully awake. "We seem to have had an accident. Anyone hurt? Is the ship all right?"

She nodded. "We did; and, amazingly enough, you were our worst casualty. As far as the ship is concerned, it is all right and it isn't. Things don't look so good." Nausea swept over him, shock-induced nausea. He knew, frustratingly, that there was nothing to be done but wait; so he fought his stomach until the spasm passed and finally

raised his head to look around. A sharp pain lanced through his forehead. He winced, put a stray hand to his right eye, and felt the lump over it.

The girl was—he had to search for the right phrase—properly clinical, and in view of what she'd said about the ship, he appreciated the lack of panic and drew comfort from it.

IN COMMON with most members of the Survey, Art Hamilton's cooperative sense was well developed; it had to be in a job where team work was more than a collection of semantic symbols, where life and property often were completely dependent upon it. That sense began to bother him now. Help was needed, so he struggled to a sitting position to see where he could be of use.

His first reaction was to blink and turn to the girl with a puzzled look. "Did that bump on the head affect my seeing, or is it just plain dim in here?"

"There's nothing wrong with your eyes." She lowered her voice. "We are on emergency power."

"Emergency...?" He whistled softly as the implication struck him. "Emergency power! Then the pile..."

"Is out," she finished for him. "Broken, kaput, gone. Power is being rationed: Steve doesn't know how long we'll be stuck here, and we can't take any chances."

Something cold gripped Hamilton's spine and wrote, with icy fingers, nasty implications on his back. "Bev, 'Here' is...interstellar space, somewhere between the Monster and Earth, right?"

She nodded slowly and said, "We're playing a game with the passengers. No one talks about it, but I imagine everyone realizes what has happened."

"What if things can't be fixed?"

"That seems hardly likely..."

He interrupted her quickly, "Drop the professional manner, please! This is me, Art Hamilton, you're talking to, not Mrs. Winters."

FOR A MOMENT her nerve almost went; she shivered and drew closer to him. "There have been ships lost before out of hyper, Art. We don't know what happened, but I think they...they let the air out, fast. Talk to Steve; he's the only one who actually *knows*. He's been instructed."

Hamilton slipped an arm around the girl. "Take it easy; we don't know how bad things are yet."

He was rewarded by a quick smile and return to the calm manner. "Who's the patient here?" she asked rhetorically and went on, "Feel well

enough to get up and go to your couch?"

He nodded and got slowly to his feet, checking the time as he did. "1713. I wasn't out too long." His eyes swept the cabin, and he stopped, startled. It was, in a word, a mess.

Visual habit is ingrained. Humans grow used to certain sights and continue to see them, even if they no longer exist or are altered. Sherlock Holmes called this a lack of observation and proved it to Watson by asking him about the number of front steps to their rooms.

Holmes knew nothing of the gestalt. Art Hamilton, however, had been used to air and space craft all his life—particularly passenger interiors with their lengthy hallways, neatly carpeted, surrounded on either side by acceleration couches. He was used to the uncluttered simplicity and smooth curves going up and over head. He was used to neat luggage racks beside the couches. What he saw he couldn't comprehend, at first.

The bar had torn loose and strewn itself and its metal containers up and down the aisles. Most of the luggage had been torn loose and was scattered randomly about. The passengers added to the confusion, milling around in s h o c k e d fashion, feebly plucking at the luggage in an attempt to do something—anything.

HE REALIZED what had happened; the data he'd received from the girl, and from what he observed before him, had been integrated on a subconscious level. No human had ever seen this before—at least, seen it and reported back to civilization with it. Something had happened to the pile; a major source of energy had been disrupted and cut off; and the ship had dropped out of hyper. Since "rate" had no meaning in hyperspace, it wasn't as bad a catastrophe as it would have been had the ship actually been travelling faster than or somewhere near light speed. The energy failure *was* bad enough to cause considerable buffeting, and result in the damage around him.

Weakly he sank into his couch and relaxed. He still felt slightly woozy and conceded to himself that it must have been quite a crack across the head. In addition to the trouble and worry into which they'd all been plunged, he was v a g u e l y discomfited. Something bothered him with an elusive mental irritation. Something that should be done...

His reverie was interrupted by Stevenson on the intercom. "We are," the Captain said, "in serious difficulty, as you all must realize. Full assessment has not yet been made; I'll let you know as soon as it is. However, I am about to add to your"—he paused

slightly, then continued sardonically—"non-comfort. We are cutting off all motivating power. This means that we will no longer be accelerating, which in turn means that you will feel no effects of gravity. It has been a long time since such has been the lot of space travellers, and you probably won't enjoy it. I'd suggest that you stay strapped down in your couches; it'll help. The stewardess will pass out foramine among you; I hope that will also help." Abruptly he cut off.

HAMILTON tried to clear his head.

"...dreadful, simply dreadful. First they throw us around; then they cut the lights way down; and now they're trying to make us all sick. *I'll* see that proper punitive action is taken when we get back to New..."

That's that old Witch Winters. Don't even have to look to know it's her. Never'll forget that voice again as long as I live.

"...and what's more, Mrs. Winters," the flat calm tones of pioneer-farmer's wife, Mrs. Drake, came through, "no one is deliberately doing this to you. I'm sure most of us around here are sick and tired of your complaints. Why don't you wake up to the simple reality that the Universe was not established to please you..."

Go get her, Drakesy! Take out all your aggression and fear on her. She deserves it—even though in a sense she's right. Can you imagine what this ship is going to be like in dim lights, free fall, and the fear that we are doomed preying on every mind. Steel yourself. We'll all have to steel ourselves.

Steel? The cage...

HE SAT UP abruptly, the mental itch gone. So that's what it was. He'd forgotten to see if his traveling companion was all right. He wondered how he could have been so stupid, but there the cage was, all o.k. Or was it? Someone else's luggage had piled against the cage, jarring it; some of the straps were broken. He moved over to it to cradle it better and stopped, stunned.

It was one of those million-in-one shots. There had been a grip thrown up in front of the cage, and the luggage coming down had slammed it against the grip. It was only a small, tetrahedral-shaped indentation, about an inch and a half across. The cage was, of course, empty.

How does this happen, he wondered. If the damn lights had been on, someone might have seen it. Now it was too late. How could things start to snowball the way they do? Things which were supposedly beyond control. One disaster is an accident; two, a coincidence; and three?

The mouse is out. The mouse is raus. The louse. Splendid. Here we are going to hell in a bucket, and you make like a rhyming dictionary.

So start to wait, fella. Wait for that startled "Oh!" which'll mean that someone has felt the quick prick of those poison fangs. Wait for the succeeding twenty-one seconds, one following the other like the footfalls of a giant coming closer and closer. Wait for the cry of anguish as the sufferer realizes what is happening. Wait for sudden sweating, the chill of paralysis that moves outward from the bitten area with incredible speed until it affects the lungs and heart. Wait for death.

Or maybe you won't be so impersonal about it; maybe it won't be someone you don't know. Suppose it's Bev? Or Steve? What would the ship do without him? Sure, sit around and wait. Wait for the pallor of non-life. Or get up off your butt and do something.

Art Hamilton arose, swiftly, and made his way toward Stevenson's cabin. Fear lent him strength, and he ignored the remarks of the passengers to stop moving around.

STEVENSON looked up from his charts, briefly. "That's what I get for allowing lax discipline on this ship. You"—he pointed a bony finger at Hamilton—"are now relegated to the status of passenger. Get out of my cabin!"

"Look, Steve, I know you are busy..."

"Busy!" Stevenson snorted, "Busy! What's with you? Don't you realize that I hold the responsibility for this ship and her passengers in my hand right now? I am the Captain, the Lord High Executioner, and the Almighty, rolled into one. All of a sudden I've got to do things that no Captain has had to do in years. Gotta navigate: think that's easy out here in the middle of nowhere? Have to make a decision on Charlie's data. Have to ease my passengers. Have to keep this ship alive. And have to decide whether to give her and the passengers the coup de grace if she can't be fixed. Would you like that decision? Busy!"

Jones came hurrying in, brushed by the taxonomist, and reported to the Captain. "The stock is all O.K., sir." There was a change in the man's demeanor that Art Hamilton felt immediately. There was an air of excitement: it was not an adolescent, devil-may-care emotion, but one tempered by the seriousness of the situation. He realized that he had observed the crux incident where a child became a man. "Good thing that we have it in plastic bottles. But I don't know

if we've enough to supply the passengers in the quantities you want. Enough to get them drunk if we have to."

STEVENSON nodded. "You had some conversion engineering and atomics in school?"

"Only survey courses, sir."

"Better than nothing; get down to the Drive Room and see if you can help Briggs."

As the young man left, Stevenson glowered at Hamilton. "You know what I have to do if we've really broken down out here?"

The other nodded lightly. "Rumors get around."

"Regs are pretty specific; I've just checked them. 'In the event,' they say, 'of a hopeless situation (e.g., a breakdown in interstellar space) a Captain is empowered to dispatch'—honest to God, they use the word—'his passengers and crew. The most efficient and humanitarian means available is to remove the air suddenly from the ship at an unspecified time. It devolves upon the Captain to choose this time. Procrastination to starvation in a vain hope of rescue is not recommended, but the Captain is cautioned to exercise and exhaust every possible means of bringing his ship safely in.'

"What do they think I am?" he muttered. "It'd have to be an idiot who wouldn't 'exercise and exhaust' all possibilities before dying by his own hand. But humanitarian?" He grimaced. "Well, the least I can do is get everyone as drunk as possible; strangulation may be fairly quick but it isn't pleasant."

HE SEEMED to be lost in a reverie, but he pulled himself out with an effort, shaking his head slightly. "I don't like this, Art. Of all the decisions I've ever made in my life, this one will be the roughest. Anyway, I have to put this ship into free fall; better get back outside."

Hamilton hesitated. He'd come in here with big news, news of ship-shaking import. He was the harbinger of evils tidings, and he suffered from the human failing of deriving more ego gratification from announcing bad news than good. Every second he did nothing increased the danger to them all and yet—and yet, he hated to hit his friend with something else. It was to his credit that he did hesitate, that he saw *Pseudomus'* escape in perspective as part of the generally-bad situation, and not the whole.

"Maybe you'd better hang on for a second, Steve," he said. "Brace yourself for some more bad news. *Pseudomus* is out."

Stevenson leaned forward over his desk, put an elbow down, and rested his head in his hand, massaging his brow with his fingers. The strain

showed in his face and in his eyes, the way he slowly blinked them as though too tired to make a normal effort. "Out?" he asked, dully.

Hamilton n o d d e d. "Escaped. Seems a grip did the damage; it tumbled on to the cage when we dropped down out of hyper. I just noticed the break." He waited, but there was no reply, so he continued, "Hell, Steve, I don't like to rub your nose in it; but the responsibility for the passengers is yours..."

"I know it!" the Captain interrupted angrily.

HAMILTON held up a hand. "Their *safe* return guy. In spite of what's happened, you still have to assume that we'll get through. And you've got a deadly animal running around loose back there—or in here or anywhere. We've got to find it."

Stevenson picked up two crimson pills of a group before him. As though he'd never received Hamilton's news he said, "Foramine. Taken yours yet?" And at the negative answer he handed the drug over. "Better take two; they'll help. And that's about all we've got on this ship according to Bev: foramine and aspirin. But what would you expect? We're ill prepared for breakdowns. Why carry drugs? We move so fast, we can get to medical help quickly—or so the theory went."

The schizophrenic, split-personalitied scene played to its conclusion then as the weary man straightened and returned to the subject, "I really don't know what to do, Art. I don't see how this changes things much; we'll go into the free state on schedule."

"But we'll all be relatively helpless—at least, our mobility will be drastically reduced."

"So will your friend's," Stevenson came back.

"Not as bad. *Pseudomus* has claws and can grasp—and is capable of quick adaptation."

"So's a man" Stevenson's reply was rapid.

THE CAPTAIN shook his head. "Sorry, but as you said, my responsibility is to the passengers. I am not helping things by wasting power." He flipped on the intercom and announced, "We will go into free fall in two minutes, at 1729 Galactic. Please stay in your couches; do not move about. The stewardess will help you when you need it. You'll find relief sacks in the arm on your right."

Then he called the Drive Room. "Charlie?... We're going free... Get set... How's it going? ...OK, as soon as possible." He rummaged in one of the desk drawers and brought out a battered cap which he flipped to the other.

"What's this?"

"Put it on; people like to see hats. Hats represent

Authority, and people respect Authority—especially in a tight situation. I'm giving you semi-official status. You may move around—and I'm ordering you to look for that damned mouse."

"OK, Steve, but why not announce it to the passengers?"

"You c r a z y? Look—all those people out there are in a frustrating, terrifying situation, over which they have no control and to which they can make no response. So they'll remain passive. But give them something nice and concrete and juicy like that animal, and all bounds go down. We'll have a fat old panic on our hands, and *that* might finish the job. There's your second order—don't say anything about this to anyone!"

He rose, muttered "Hang on!" and killed the drive at the master control.

V

HAMILTON felt that it really wasn't so bad. After the first shock, and a few moments of reorientation and adaption, it could be borne. There was some slight nausea, but the foramine was taking care of that. Physical motion was, of course, difficult; but because of the very nature of the trans-continuum craft, it was more easily undergone than might be supposed.

Men moved, if it could be called that, fast. They ate distance, cheated time, had interstellar space for tea, and tossed off intergalactics during the cocktail hour. One, two, three hours? Five at the outside, for a long voyage. What need for large, bulky craft? Ships, on the long runs, carried dinner for their crew and cargo and some mail. But their size was limited by the number of passengers they were to carry.

They were e s s e n t i a l l y cylindrical, with passenger space arranged down the long axis. Fairly narrow, it consisted of a central aisle and acceleration couches paralleling it on either side. In front, the Captain's cabin; and at the rear, the Drive Room.

As he grew accustomed to the gravity-free state, and making constant use of the couches as handholds, Art Hamilton gained a certain degree of facility. Soon he was able to move as well as the crew, who'd had yearly training under such conditions.

The stewardess had been horrified to learn of the creature's escape and had suffered the same agonies Stevenson had: those of being pushed down by a great weight to which an idiotic, fickle Fate kept adding from time to time. But she, too, like Stevenson, had a certain pride in her job and recovered fairly quickly. She was frightened, yes, but she converted that fear into positive action. Between tending the needs of

the passengers—she referred to them, cynically, as her "flock"—she joined Art Hamilton in the search.

"IT WOULD be nice," he muttered when they'd reached the bar, "if we could see what we were doing."

"I agree." Her whisper was soft in his ear, and she was disturbingly close. He caught a faint trace of her perfume and shook his head, exasperatedly. "What's the matter?"

"The irony of it. Finally I am alone with you in the dark..."

"We're not alone."

"...and what am I doing? A man could go mad, mad..."

"You're nothing if not persistent."

"...mad, I tell you. Alone with The Girl in the dark..." He heaved an exaggerated sigh. "I tell you, it's a taxonomist's fate. Hunting mice. Under different circumstances..."

"Under different circumstances, maybe yes. However, right now you'll be *wearing* a mouse"—her voice tightened—"if you don't keep your hands to yourself."

"What the devil are you talking about?" He stopped whispering angrily and spoke the last of the question.

"Something was touching me..." Comprehension dawned. "Something. Art! Something is crawling on me."

"Don't move!" His command was whispered, urgently. "Whatever you do, don't move. Now, where?"

"My back—no, left side near the ribs."

"Easy. The light is so crummy in here...wait." Suddenly he laughed. "You can relax, now, Bev. What was 'crawling' on you was the visor of this hat Stevenson said to wear. I took it off when I bent down to go under that chair; guess it must have floated up."

The girl breathed deeply in relief. "You know, I was scared."

"You had every right to be. I was, too."

SUDDENLY she linked her arm in his and leaned against his shoulder, relaxing. It was one of those infrequent moments they'd had together in the past. The feeling was one of completeness, and both of them had learned to recognize it. It had all the plus values of telepathy with none of the disadvantages such as lack of privacy. There was understanding—integrated understanding—that bridged the semantic gap separating all humans. It was this feeling in the past that convinced him this girl and no other would be his wife.

"Art?"

"Hmm?"

"Times like these I feel like chucking the whole works and letting you make me an honorable woman."

He drew her close and kissed her—almost politely. There was a great reluctance on Hamilton's part to transgress their rapport; however... He leaned toward her again...

"Art?"

"You talk too much."

"Mrs. Drake's light is flashing. I've got to go to her..."

HAMILTON groaned an interruption. "And Art," she continued, "for what its worth to you, this is once when the usual interruption annoys me more than you." Then she was gone, leaving him to get his blood pressure to normal, smooth out his hair, and continue his hunt for the Mouse.

It was to no avail. Frustratingly, maddeningly, the animal had disappeared somewhere in the ship. He tried to think. It could, of course, be in plain sight, but he doubted this; in the past, it had exhibited too much shrewdness for that. Besides, movement in free fall was difficult, at best. Hamilton thought that it probably was clinging to something, not moving at all. What worried him was the possibility of its hiding in someone's coat, or holding on to some other clothing. Under the present conditions it would be nervous and even more inclined toward offensive action.

The general lack of motion throughout the ship, the dimness, and the gravity of the situation had all combined to produce a certain lethargic attitude toward their danger in the passengers; Hamilton himself felt this; he had a tendency to theorize rather than hunt. So it was startling, like a book dropped in a library, when the intercom again came to life. "Will all ship's personnel report to the Captain's cabin."

HE WAS ABOUT to continue hunting again when he realized that he was included in that grouping. With something of a wry smile, Art Hamilton put on his cap and moved down the passageway. He'd almost reached the cabin when the thing of which he'd been afraid happened. There was a cry from the rear—and the sound of it told him it could have come only from one passenger. The boy!

Whirling, Hamilton forgot he was gravity free. Cursing, he felt himself being carried to the top of the passageway, felt himself smash into the ship's alloy. The blow was hard, but he paid no attention. He concentrated on getting back, running through taffy, oblivious to all but the child's cries.

They ceased before he could reach the couch.

Hamilton continued bracing himself for the mother's shriek.

But there was none, and when he arrived, the boy was

all right, two tears glistening in the corners of his eyes.

"What happened?" Hamilton burst out and then paused, feeling foolish. It might have been a diaper pin. Wait, kids of three didn't wear diapers—or did they?

"Scaired yew, scaired yew." The words were staccato, the talk-and-cry noise of the very young.

Exasperatedly, the mother asked, "*What* scared you, Dana?"

"No, no, mommee, Yew scaired.. yew scaired animul," he finished triumphantly.

"Don't be silly, there's no animal here." The boy's face clouded up again, and the taxonomist was struck with an inspiration. He was still wearing his field clothes, having had no time to get his stored things in City One. Reaching deep into a pocket, he drew out a piece of hard candy all team members carried. It was handy when water was scarce. His questioning look was answered by a nod of the mother's head. Hamilton gave the youngster the candy.

"Which way did the animal go?"

"Don't noe. Want it."

"But you say your mommy scared it?" At the boy's affirmative, he went on. "Where was it?"

"Rite heer." He pointed to the arm of the couch. "Prittee animul. Want my animul."

"How big was it, Dana? As big as a kitty?"

"No. Litl wun."

THE MOTHER smiled at Hamilton. "It must be the strangeness, the dark, gravity-free state, and all. He has a very active imagination; is always telling me about the dinosaurs he sees."

Hamilton nodded, cold sweat on his back. He straightened from where he'd been kneeling and tousled the youngster's hair. "You're a good boy."

There was another admonition from the loudspeaker for all personnel, and reluctantly Art Hamilton left. The youngster's voice reached him as he manuevered down the aisle. "*Like* that man, mommee."

Briggs was already there, discussing something in low tones with Stevenson. Hamilton came in, nodded, and stood, feeling somewhat useless. He was followed by Jones who looked as though he alone was carrying full responsibility. Finally Beverlee appeared, concern written on her face.

"Steve..." she began, but he interrupted her with a wave of his hand.

"In due time, Bev. We'll all get a chance. But I want to get this." He turned on the recorder and spoke into it. "Informal log entry, Transcontinuum Ship Alexandrite, 1812 hours, Galactic Standard.

Entire ship's company present. Stevenson, Captain; Briggs, Navigator-Engineer; Jones, Aide; Fleet, Stewardess; and Hamilton"—he paused for a moment, apparently looking for the proper phraseology, and an evil smile crossed his face as he apparently found it—"semi-official Mousetrap. This will be a further report on the situation as outlined in log entry, timed 1710 Galactic." Then, with the machine still going, he nodded toward Briggs. "Go ahead, Charlie."

"WELL," Briggs rubbed the back of his neck with his hand, "things still don't look good as I see them. We seem to have about three alternatives: dying here, dying on the way home, or maybe making it back. But at least we do have some sort of a chance. And you can thank Jones for that; it was he who found the inbalance between the pile-converter and the torps."

Jones shot Briggs a look of gratitude that was expressive of his thanks. To be given commendation, even in an informal entry, meant a lessened period of apprenticeship.

"We can fix it—temporarily. But here's what will happen: the torps are out of whack and cannot exert complete control. Once we go back into full conversion and enter hyperspace, trouble can start at any time. And there won't be any second chance. With too much mass in Step II you get sort of a pre-ignition. Energy there'll be, only it will be heat energy—in a hurried damn sudden."

"Are you trying to say politely that we'll become an atomic explosion?" asked the stewardess.

"NO," BRIGGS answered, "Not exactly; it'll just get tremendously hot. Certainly hot enough to melt this ship; possibly hot enough to cause complete vaporization. In any event, the degree is purely a matter of theoretical concern. By then we won't be around to appreciate it."

"And there's nothing you can do?" she asked.

"No, Bev." Briggs was grim. "I'm not trained to deal with this heavy stuff. Navgineers go along to repair leaks, not dykes. And even if I were capable of knowing what to fix with a hairpin, I still can't do it out here. I've got to have the hairpin—which is a figurative way of saying that I haven't the tools."

"Charlie's right," Jones put in, "even though he underestimates his own ability. He's familiar with the theory of the thing, just as I am. Only we need micro-techniques, and all we have available are megatools."

"So, what's to do?" Hamilton asked.

"As I said before," Briggs

answered, "I can put things right temporarily. We might make a run for it. However, once I start it I can't stop it. And I don't know how long the equipment will last."

Stevenson said abruptly, "I have to have some time with which to plan; you've got to give me an estimate."

"I know, Boss, I know." Briggs rubbed the back of his neck again and squinched up his eyes. "Well, say about an hour and a quarter—plus or minus half an hour."

INVOLUNTARILY, they all glanced at the time. It was 1816. Art Hamilton wondered what thoughts were going through Mrs. Winters' head at that moment. They were due in New York in four minutes; they should have checked with Station One some fourteen minutes ago. Obviously they were going to be late.

"Not enough time," the Captain muttered, "not enough time. I can't work with that kind of a margin. It only gives me thirteen minutes, assuming Charlie's mean is correct and not his minimum. Still, there's not much I can do. We'll go ahead and take our chances. Any questions? Charlie, what about you?"

Briggs shook his head. "Nothing, only remember those torpedoes."

"Jones, what do you say?" John Paul Jones, Ship's Aide, had leapt to his feet, his eyes glittering, his psyche seemingly not his own. "I say damn the torpedoes; full speed ahead!"

The girl's head snapped up.

Stevenson snorted, "What do you mean, 'full *speed* ahead'?"

Briggs turned slowly to stare at the younger man; then he shook his head in Hamilton's direction.

Jones reddened under the onslaught. "I...I don't know; the words just seemed to pop out."

HAMILTON felt the younger man's distress and broke the tension by recalling their problem. "I'll buy it, too, Steve."

The Captain nodded and looked at Beverlee.

"Steve, maybe I'm being optimistic, but I don't see why you *can't* do it, assuming we've those thirteen minutes extra."

"Because I can't land at New York, that's why. You hear what these men have said. This ship will be a lake of several tons of molten metal shortly after we arrive. Can you imagine what that will do to the landing area of the world's biggest port, to say nothing of the local traffic snarl it'd cause?" He smiled nastily. "If it happens shortly *before* we arrive, then we have no problem."

Hamilton asked, "What about throwing us into an or-

bit that matches Station One's? Then we could radio them to come out and get us off. That might work. Maybe we could even leave the ship in suits if we had to—as long as we were close enough."

Briggs looked at Stevenson, and at his nod, said, "That won't work for several reasons, Art. In the first place, we haven't got any suits; liners don't carry them any more. In the second, have you checked the navigation area? It is an electronic junk heap; the only way we could communicate with the outside world would be by wig-wag semaphore. We haven't any radio."

HE STOPPED and turned toward Stevenson. "There's a germ there, though, Boss. If we went into an orbit close to the Station, eventually they'd come out for us, radio or no."

"No!" Stevenson said. "At least, not in thirteen minutes. I think we'd better put down, all the way. But it's a lucky thing we haven't any pregnant women aboard. In view of everything that's happened, they'd probably be birthing by now. Nothing else could possibly go wrong this trip."

"Steve, I'm sorry." The stewardess touched his shoulder. "I tried to explain when I first came in. There's another reason why you have to go directly in. Why, even if the radio was working you'd still have to land at New York and not in the wilds—melting ships or not."

They were all listening to her then. They'd heard it many times during that "routine" flight, that certain tone of voice that said something was wrong. She continued, "I'm not sure; I couldn't possibly be. But a stewardess' training touches on a lot of subjects: first aid is one; we put in many hours in its aspects and ramifications. It's Mrs. Drake..."

She paused, and Stevenson asked brusquely, "Will you make some sense? What is it? What's the matter with Mrs. Drake?"

In a flat monotone, she replied, "She needs emergency medical care—it's her appendix. I'm afraid it may have burst."

VI

THEY PUT Mrs. Drake in a couch, and made her as comfortable as possible. They had ice—from the bar, used for a purpose never dreamed of by the original planners of the ship. They packed the inflamed area in it. They had foramine and aspirin; the former completely useless in this instance, and the latter administered, albeit indiscriminately to bring down the fever. The sensation of gravity returned

with the torps working again, and this seemed to help. They made Mrs. Drake as comfortable as possible...and stood there, making the fussing, helpless motions afforded the ill without benefit of medicine.

She took it well, they all thought. She was, they knew, frontier stock with all the phrase implies; she was used to more hardship than a city dweller. In spite of her actual physical condition—and this was something they didn't know—she was bound and determined not to complain about anything. At home, she would not have been such a stoic—frontierspeople feel pain—but here she was showing her contempt for her despised "civilized" counterpart, Mrs. Winters. Unfortunately, the subtlety was lost: that worthy was almost completely unaware of the state of the Drake appendix. She looked upon it as merely one more annoyance in a very disturbing trip.

So they were engrossed; they had something to do. They had to worry about the sick woman, and didn't notice the passage of time. Stevenson made no attempt at show. The ship went into hyperspace for two minutes and dropped back down to normal an hour's flight from Earth. Not one of the passengers was really aware that, if they made it, they would be the first in history. A ship that had broken down in hyper and come back to tell about it! There was much to be learned from this simple fact alone, perhaps something which would save lives in the future. Of this the passengers were unaware; they were even unaware that they were still in very great danger.

STEVENSON was completely aware—Stevenson, who, in spite of annoying, sarcastic manner, had fought for his passengers, crew, and ship. Stevenson, who even now was planning his course in, bitterly realized he had to destroy a large part of the New York landing area if he got that close. He was aware that the odds didn't favor this ship.

Beverlee was aware. Beverlee, who on a professional level never let things bother her, was ministering the wants of the patient. Beverlee Floyd, angled at, ogled at, and wanted by a hundred passengers—predominantly male—knew and was aware that if they made it, she had a major decision to face.

Jones was aware. Jones, late bartender, ex-adolescent suddenly come of age, who was more recently schooled and perhaps of all of them had more knowledge of the potential destruction they were and actually, they could become, was calculating. Jones, who still retained his dreams of glory and was hop-

ing to correct the trouble with a hairpin, who—if they made it back—could possibly get a navigator-engineer rating on one of the "automatic" freighters, he was aware.

Briggs knew. Briggs: solid, sturdy, always-a-first-mate-and-never-a-captain, was aware. He felt, perhaps correctly, that getting them home was his job. It was Stevenson's responsibility, but his work. Briggs, closer to the source of trouble, was frightened, scared clean through. Briggs, who never before had faced this, bore out the confidence company officials had had in him, worked a minor miracle in fixing things temporarily with nothing.

ART HAMILTON continued to patrol, especially after he'd noticed the time. It was 1854.

Be in soon. Time is passing. Lucky Briggs will be able to wire that cage together. You: you'll be held responsible for the animal's escape. Avoid that—bring it back to captivity.

Know who'll be held responsible if it bites? You: you'll draw the blame. In a sense you'll deserve it. But face facts. It isn't the responsibility that's getting you down. It's the thought of The Bite. Can you look again at the process? Can you stand watching another human die the way Belcher did? It isn't pretty to watch, is it? Avoid that—bring it back to captivity.

That's not so easy. Where is it? Come on, bright boy. You have an instinctive way with animals, don't you? Don't all dogs lick your hand? And the cat that walked alone walks with you. Come on! Where's Pseudomus hiding? And is she staying in one spot? You've got to find her—for the Monster—and, now, for Earth!

He passed Briggs during the search. They paused briefly, lighting cigarets. Briggs' hung loosely in the corner of his mouth; he drew deeply upon it. Some wisps of smoke curled up and around his nose, and passed his eyes; he squinted to avoid smarting. But Hamilton was surprised to see no real exhalation as such—it seemed as though the other were simply ingesting the smoke.

"The cage is done, Art. I left it at your couch," Briggs said in a tight voice. Hamilton studied Briggs' visage more closely. The man was tired; he could see that in the frown, the negatively curved eyebrows. Dirt and oil were spotted randomly across one cheekbone and ascending ramus. But something else was present, too. There was tension, expressed in little beads of sweat across the forehead and drawn whiteness around the lips.

SUDDENLY it struck Hamilton.

"You're absolutely right," said Briggs, following his line of reasoning. "You are on borrowed time; it is now 1859 BBT."

"BBT?"

"Briggs Borrowed Time. From here on, we can fry at any moment."

"You know, Charlie, I'd almost forgotten. Got a problem of my own. What'll it be like when it comes?"

"Fun—lots of fun. The temperature will go up slowly. You won't even know it at first. All of a sudden you'll feel the increased heat. And from there it begins to speed up, but not so fast that it won't cause a lot of suffering. Depends on how far away we are. If we've a reasonable chance, the Boss'll try to bring her in. Otherwise—well, we can still let all the air out in a hurry."

"This is the damndest thing for a routine trip. I've never lived so close to so much violence for so long."

"You sure have, fella."

"What do you mean, Charlie?"

Briggs threw the answer over his shoulder as he walked away. "You're a man, aren't you?"

A SMALL scream from Mrs. Winters brought Art Hamilton up short. It was the sort of noise she might have made if she'd been stuck by a pin—or a pair of twin, poisoned pins. He rushed to her, a stride ahead of the stewardess who came from the opposite direction. The passenger was white.

"What is it, Mrs. Winters?" asked Beverlee, her nervousness revealed by the way the words came tumbling out. Hamilton dreaded what he was about to hear.

"I...I...saw it! I saw it—a...a mouse, a rat!" exclaimed the woman.

Hamilton and the stewardess exchanged glances. "Are you all right, Mrs. Winters?" he asked.

"Of course I am." Then, she misinterpreted his question, thinking the taxonomist thought she was having hallucinations. "I tell you, I saw a mouse, right down there in the aisle. What kind of a line is this that allows those creatures aboard its ships? I tell you..."

"I'll see if I can locate it," Hamilton interrupted quietly. Actually, he was relieved. The woman was obviously unhurt, and Pseudomus, while still at large, was somewhere in the vicinity. Perhaps the next few minutes would bring results.

In spite of diligent searching, they didn't. Earth grew larger on the viewscreen. Now they were in sight of the goal, and if the passengers were not aware of what was driving the ship, Art Hamilton was. He was part of it. It was not power; it was simple human urging, the mentally

expressed *"Go!"*, the speeding to get to a refueling point before they ran out of fuel. Hamilton ground his teeth and refused to allow torps to get out of hand.

ONCE MORE he was cognizant of Beverlee by his side. They smiled at one another, but worry clouded the warmth.

"How's Mrs. Drake?" he asked.

"Pretty good, I think. And how's the search?"

"Haven't found it yet."

"I think you will."

"Thanks for the vote of confidence. Anything I can do in return?"

"Yes." Suddenly he felt that she was close to the breaking point, as she'd been when she told him about the pile. "Will we make it? Seeing Earth is almost more than I can stand..."

"I know how you feel," he interrupted. "It wasn't so bad when we were out there; you could be fatalistic about it. But here—it's so close. You can almost reach out and touch it. But I'll tell you this, Bev. If human will has any effect, then Steve, Charlie, Jones, and I—and you—will bring this baby home."

She straightened. "Thanks, Art. I can..."

Again she was interrupted, this time by the mechanical tones of the intercom. But regardless, the excitement in Stevenson's voice came through: "We have just passed the orbit of Station One. Landing in eighteen minutes."

HAMILTON sighed deeply. "Got to go," he said to the girl and began searching again. Now the tension began in earnest. Eighteen minutes! Their fate depended upon the capriciousness of the gods—that, and the statistical fusion of atomic particles. Briggs and Jones were in and out of the Drive Room with amazing frequency. He realized that it wasn't actually amazing: thinking back he knew it was only once or twice. But he was, at that moment, extremely sensitive; and every time he saw one of them, it seemed as though it was for the hundreth instance.

What he couldn't understand was the indifference of the passengers. Surely they could see that things weren't normal. Nevertheless, their talk was of landing, of being late, of hotel reservations. It was grim—that talk might suddenly evaporate into screams of pain. Was it, in fact, growing warmer? No, it was his imagination.

But with it all, the excitement, the fear, the tension, and the worry, the escapee was uppermost in his mind. It was necessary that he find it, and he only had eighteen minutes; no, less, now. Why hadn't it bitten? He was pretty sure he knew. But what if

he were wrong and it bit in the next few minutes? Wouldn't that be the biggest tragedy of all? Possibly, but it would only bite one person —if he were correct. And he *had* to be right; there could be no other answer. If there were, it might mean that Man had lost.

So he began to make the last checkup. And was interrupted.

"YOUNG MAN!" It was the imperious voice of Mrs. Winters. "Young man, you make me exceedingly nervous. Why have you been wandering up and down the aisle ever since this trip began?"

"I'm sorry, Mrs. Winters, but I haven't time to discuss it now." ("Sixteen minutes!")

"I insist you take the time! First, this trip was held up for you. And then we run into all sorts of trouble. We could have died out there—and how do we know that you didn't cause it?"

Person from Porlock! It was a mental curse. *Let me go.*

"You haven't answered me, young man."

"Your allegations are obviously ridiculous. Now, if you'll pardon me..."

Stevenson's words came over the intercom, each one sounding like a sentence of death. "Will all passengers and crew strap down, please. We are about to decelerate.

Too late? Mankind too late by the space of one Mrs. Winters? Impossible; there was still action that could be taken. He raced for the forward cabin, for Stevenson.

The Captain looked up as he entered. "Still disobeying my orders? I wasn't fooling. Get out and strap down; you know the situation. I haven't a moment to spare jawing with you."

"Steve!" Hamilton's voice carried the sincerity of desperation. "Steve, when you get down, don't open up. *Don't let 'em out!*"

"You're crazy. Your mouse isn't that important."

"It is..." ("Thirteen!")

"It isn't!" Stevenson roared and began strapping himself down, checking the control panel. "And I'll give you thirty seconds to get the hell out of here and into your couch. Or don't—you have my permission to break your neck."

Hamilton got.

THEY WERE down.

It was that simple. They were down, safe, alive. There had been no tell-tale rise in temperature, no throat-catching realization that they were to die in space. Earth—home and mother—had received them with open arms.

Nearly open.

Station Three had seen them go past and had gotten no response to frantic radio and viewscreen signals. Like all the stations, Three had the

equipment to destroy derelicts, meteors, and such which might threaten populated areas. Originally all stations had been established for a far less peaceful mission, but the days of intra-specific warfare for man were gone.

Their fate awaited a decision by the man in command of Three—a decision made in micro-seconds. They went on—never knowing that it was a small incident in his background that saved them.

As a young lieutenant, he'd often asked himself how he could tell the difference between a derelict and a ship in trouble. Of course, it was a theoretical question: nothing ever happened to ships. But just suppose... Well, a ship in trouble, without ability to communicate, would move just so.

That rationalization arose from his subconscious then; he called it a hunch. But he gave the order—in the face of incredulity of the Station's crew—not to destroy.

Three passed the news on, and the animal which had learned to communicate better than any other on its particular speck of cosmic detritus moved that news from city to city. Emergency warnings set off chains of reaction, and they were ready and waiting long before the ship arrived.

It was obvious she was heading for New York, and the field there was in a flurry comparable to that of Brownian Movement. Traffic control was more frenzied, perhaps, than other departments, Crash wagons were alerted and luggage carriers. Loading operations were interrupted: if she were derelict, there was no telling what she'd hit. Personnel were evacuated—and the city itself was warned.

But soon it became apparent that the ship was under control. She came in for a normal landing, settled, and stopped firing. Only, observers asked, why did the rear end continue to radiate heat?

ART HAMILTON was out of his couch even before they'd come to rest. He ran to Stevenson's cabin, in time to stop him from opening the egress doors.

"Steve, wait!"

Stevenson paused. "We're sitting in a time bomb, and you want me to wait. No."

Hamilton held up a hand. "It could get out in their luggage—their clothes, even."

Briggs suddenly burst into the room. "Boss, move 'em. For God's sake, move 'em! It's started; the temperature's up."

"Steve!" Hamilton's voice brought both the others up short. "Don't do it—the fate of this planet may be hanging in the balance. I only need a little time—moments."

"Listen!" Art Hamilton's voice carried the desperation he felt. "If it were a question

of just the mouse, I'd say we could take our chances. But it is more—much more. The beast isn't a him, it's a her. And, she's about to give birth!"

Setvenson laughed, a staccato, barking, nearly-hysterical laugh. "I knew it, I knew it! I did have a pregnant one on board."

"I didn't tell you because it seemed a minor matter, then and I didn't want to add it to your troubles. But now, don't you see?" The taxonomist gripped the Captain's shoulders. "They're small; they can go anywhere. They thrive on our food. If this one gets out in the luggage, tomorrow there'll be three—or ten. There'll be a hundred thousand in Shanghai next year. And these aren't mice with no means of striking back. These are deadly—a slight touch...deadly, Steve. Steve?"

THE CAPTAIN stared at him, and Hamilton met his gaze. They stood outside themselves for a moment, spectators to a silent battle of will existing between them. Finally, Stevenson looked away at Briggs. "How much time, Charlie?"

"God—I don't know. Maybe six, seven minutes. But you aren't going to let this maniac argue you into it—we've got to be away; far away. It'll be hot."

"We can use the luggage carriers for transportation," Stevenson said. "You get four minutes, Art."

Hamilton raced back into the passenger area. He picked up the cage and turned to Mrs. Drake, still strapped in her couch. He was in an airless, non-material void—this had to be the answer—but dimly he heard Stevenson's voice in the background.

"Something has come up which prevents our immediate disembarkation. Please stay where you are and don't move. But be prepared to when I say so—and be prepared to move fast..."

He stopped listening and concentrated on the immediate task. Bending over Mrs. Drake, Hamilton said, "I need your cooperation: fast, and with no questions."

"I thought something was wrong—something apart from the ship—from the way you've been acting. What can I do?"

"Don't move—just don't move. There's a small but deadly animal loose on board. I think she's somewhere in your vicinity." Hamilton, while he talked, began to remove the coats they had placed over the woman to keep her warm. He worked slowly—in his mind it took forever—but deftly. He begrudged each passing instant as an enemy that was beating him.

AND HE was aware, also from the background, of

two voices, each one of which gleefully joined hands with the enemy against him.

Mrs. Winters': "Let us out —it's getting warm in here."

Stevenson's: One minute's gone, son. Three to go."

He removed the last coat, took a cursory glance, and felt the blow in the pit of his stomach. He didn't see it. He'd missed—and maybe ended man's domination of Earth. Defeat swept over him, so bitter he shook with the taste of it.

"Two minutes." Stevenson, calling the roll for Homo sapiens. Art Hamilton shrugged, ready to leave. *And then—and then!*

"Nice amimul, mommee."

Again, it was the boy's voice from the rear. Desperation hurled Hamilton back to the youngster even before the mother finished saying, "Captain! There's a mouse here!"

Both of them had been sitting in their couches, preparing to leave. The boy's coat was thrown across his lap, and it was on the coat that Pseudomus had jumped.

IT WAS A picture Hamilton would never forget: the mother instinctively knowing something was wrong, her face reflecting doubt and fear; the youngster, a wonderful new pet literally dropped in his lap and a wonderful grin of appreciation lighting his eyes as he reached for it; and the beast, purple head up, a concentrated dose of death.

"Don't move!" Hamilton's command was throaty. "Dana! Don't move!" It was the voice of authority that a small child particularly understands. The boy was motionless.

Without turning his head, Hamilton said, "Steve, move 'em from up front—but don't allow any activity back here." He began to edge nearer.

Why did it have to be the boy? So young! It was the penultimate occurrence on a lousy trip. One slip—but he couldn't afford one slip.

It *was* warm in there. He felt the sweat gather on his forehead and cheeks and wished he could take time to wipe it off. It formed and drenched his shirt under his arms. It trickled down his back.

"Three minutes, Boss."

He paid no attention to Briggs' voice. Instead, he said to the youngster. "You only think it is a nice animal; it isn't. It's a *bad* animal and should be spanked.

"No don't move! . . . Dana, I have to take the bad animal away."

"No! Want my amimul. *Want* it, mommee."

The sweat now began to run off his forehead; it cascaded over his nose, dropping across his lips and chin. He was barely conscious of the sounds from up front—the noises of hurriedly departing passengers. Then he was back

in the pool of intense emotion concentrating only on the task of saving a life.

ONCE MORE came the inspiration. "Tell you what I'll do, boy. Remember the candy? I'll give you a box of it if you let me take the animal."

"*Beeg* box?" Then seeing his mother's stern face, he recognized the inevitability of adult victory. "All right."

Hamilton came up for another breath and was suddenly cognizant of the circle of spectators which had formed and which realized that an unnamed struggle was going on. Then, at that moment, they must have understood in some tension-engendered telepathic fashion, that his fight was theirs. None of them interrupted his concentration with speech or movement. He took another look at his antagonist, and it glared back at him.

Nobody's going to do it for you. Get going. Nobody's here that can do it for you. Move your arm up. Slowly...slowly.. not too fast...it sees you coming...slowly...careful, remember it jumps...easy ...Belcher said it hurts... easy...concentrate...now!

He lunged and caught the purple beast on the skull immediately behind the ears. There was an agonizing moment when he felt the head turn in his sweaty grip. Then he tightened, and despite the squirming, quickly dropped it into the cage.

THE PASSENGERS were all out, leaving in luggage carriers commandeered by Briggs and Jones. The three of them—Beverlee, Hamilton, and Stevenson—were the last on the hydraulically operated platform which extended upward to the unloading port. Even as they settled down into the carrier with the other officers, the tail end of the ship began to glow cherry red.

The color continued to brighten as Jones drove away. And Art Hamilton, who thought he'd experienced all the violent emotion he could take in any one day, recognized a new fear. Would they be far enough away in time? It was anti-climax; his mind simply couldn't maintain the level he'd forced on it the last few hours. Bone tired, he relaxed and watched.

Stevenson saw their faces and wouldn't let them think of failure, not with safety so near. In exaggerated tones he said, "Hmm—1924 Galactic. Not bad, that. Only sixty-four minutes late, and considering what we've gone through..."

Briggs interrupted, "Damn these slow carriers! Can't we get more speed?"

In fascination they watched, slow-motion spectators to a heat process gone amuck. The ship was glowing brightly, carmine-streaked

against a sky beginning to darken. Not carmine, really. More the color of the gem for which the craft was named. The Captain tore his hypnotized gaze from it. "What about this thing, Art?"

Wearily Hamilton forced himself to make conversation.

"I finally began to think—to use my 'animal sense'—when *Pseudomus* didn't bite anyone. I couldn't be sure, of course, since I really knew nothing of her habits. But an awful lot of mammals will seek cover during the birth process; they want to be by themselves. It seemed a good guess that she was doing the same.

"You can see what a spot I was in. If she had given birth aboard the ship, then the little ones might have scattered all over—and it would have been easier for the little ones to get out. If she hadn't given birth, but had been able to get out, things would have been just as bad."

IN SPITE of the soothing effect of Hamilton's flat monotone, none of them could completely ignore the situation from which they ran. It was there: the honed razor-edge, the breaking-point tautness of the rubber band. Ahead of them was safety; behind, flaming destruction.

In quiet tones, Stevenson suggested, "Go on."

Again the young man disciplined a mind that wanted none of it. "Can you imagine what would have happened? I suspect the animal has an awfully short gestation; no more than four or five weeks. With no natural enemies of which we know, with the mouse's equivalent of Eden being in association with man and particularly his food, with a deadly offensive weapon, and with, albeit primitive, reason, I think it could have jeopardized our position on this planet."

Stevenson looked at Hamilton with something more than skepticism and less than pity. "You honestly believe that?"

"I'd hate to have had to put it to the test."

They were interrupted by the clanging sirens of the crash wagons, the fire engines, the hastily gathered cars which sped to them. Transference to the faster vehicles was accomplished quickly, but Hamilton moved in a dream-like state. He only partly recognized Briggs' stentorian shout, "Dammit, don't *try* to put it out. Just get us the hell outta here!" He only partly realized the intense heat rolling down at them. It was all over; they were safe.

AT THE EDGE of the field they disembarked, milling about, but with all eyes on the ship. In spite of the distortion caused by heat waves, Art Hamilton could

see ridges and bumps beginning to form. In a few seconds they had become molten droplets which coursed down the sides. There was, here and there, a shower of sparks as though some gigantic cutting torch was being employed from behind.

It was white now and getting harder to watch. The droplets beginning to hit the concrete did not break up when they splashed. He was puzzled until he realized that already a molten pond had formed. And then one of the tripodal supports melted through at the base. The ship shook slightly and with a screech of rent metal, fell heavily over upon its side, sending up a huge spray of magma. It became too hot to look at.

Stevenson said, with a touch of sadness, "There's the end of Trans-continuum Ship *Alexandrite*—a fine lady, even if she was stubborn at times."

Jones added, "The end of an historical era, too, Steve. With what we've learned, no ship will ever again break down in hyper."

Hamilton stumbled away; his fatigue merely accentuated his mental distress. He was so depressed he almost didn't hear Beverlee's soft voice in his ear. "Wait, Art; don't run out on me now!" He stopped speechless, surprised to see her in the confusion.

"What about your pregnant girlfriend?" she asked.

"In our half million years or so, we haven't yet failed to come up with a solution of some sort to what's been bothering us." The young man straightened, and drew his shoulders back. "There'll be problems, but I'm sure we can work something out."

She'd drawn very close to him; with an ache he realized the rapport suddenly clicked back into place: they were a unit again. That old clarity, of knowing what the other partner was thinking, was back.

"Bev?"

"Hmm?"

"Bev, back in the ship you said..." His voice trailed off.

With a twinkle she turned her face to his, nodded, and said, "There'll be problems—but I'm sure we can work something out."

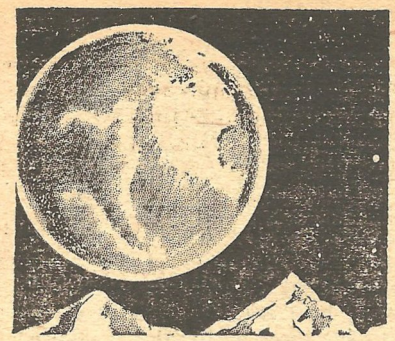
★

Next Issue

THE EARTHQUAKE REMEDY

A Sequel to "Cargo: Death"

by T. H. Mathieu



Special Feature

POINT OF VIEW

by Isaac Asimov

How would the Sun appear to you if you were on, or near one of the other planets? First in a series of articles on the Solar System.

IN HAVING their characters waltz about the Solar System, science fiction writers sometimes pay their respects to the Sun by referring casually to the Sun's "shrunken globe" or "swollen globe", depending on the point of view; that is, on whether the space-traveller is outside or inside Earth's orbit. Rarely or never do they (and I include myself, I add hastily) give even a faint notion as to how shrunken or how swollen it is. And yet this is the sort of thing that can be figured out; so we, as science fiction fans, ought to know such things and not have to endure the humiliation of waiting until real space-travellers come back and tell us.

TO BEGIN with, the method of measuring the brightness of any astronomical body—the Sun included—dates back to ancient Greek times. Hipparchus of Nicaea first came up with the notion of "magnitude" at about 140 B.C.; but Claudius Ptolemy, the Alexandrian astronomer, popularized the notion and affixed it permanently to the stars in about 150 A.D.

The "magnitude" system, in ancient times, involved a visual division of the stars into groups according to their apparent brightness. The brightest stars were said to be of the first magnitude, while those just barely visible were of the sixth magni-

tude. Spread evenly between these limits were the second, third, fourth and fifth magnitudes.

Modern astronomers accepted this principle but made it quantitative. The light emitted by the twenty "first magnitude stars" of the ancients were individually measured by instruments, and the average was fixed as magnitude 1.00. This average brightness was found to be about a hundred times that of the dimmest visible stars, and this they divided up equally among the magnitudes. A star of magnitude 1 was set 2.512 times as bright as a star of magnitude 2, which in turn was 2.512 times as bright as a star of magnitude 3, and so on. In this way, a star of magnitude 1 is 2.512 x 2.512 x 2.512 x 2.512 x 2.512 times as bright as one of magnitude 6; and if you multiply all those 2.512's, you will come out with a product of 100.

(Notice that the magnitude system is a logarithmic one. That is, the steps of brightness progress by equal *multiples*, rather than by equal additions. This is the way our sense-perceptions happen to work—which is fine, except that it means that calculating magnitudes involves working with logarithms. But then, we can't have everything, can we?)

OF COURSE, once the light delivered by a star is measured accurately, it is bound to turn out that the star isn't 5th magnitude on the nose, or 4th magnitude, say, but somewhere in between. Each magnitude was divided into tenths and hundredths on a logarithmic scale, so that a star of magnitude 4.6 is about 1.096 times as bright as one of magnitude 4.7; and one of 4.66 is about 1.009 times as bright as one of magnitude 4.67.

(These fine distinctions are blurred by the fact that the human eye is more sensitive to yellow than to red or blue; a photometer is generally more sensitive to blue than to yellow or red, so that it doesn't see the same brightnesses we see. Furthermore, stars are emitting radio waves, infra-red, ultra-violet, x-rays so that *visual* brightness may not really measure the total activity of a star. However, this is a worry we can leave to the astronomers; they are welcome to it.)

Naturally, there is nothing that restricts the magnitude system to visual stars only. We can include the stars visible only by telescope, by the simple expedient of carrying the system through magnitudes 7, 8, 10, 15, and well into the twenties. Anything past 6.5, however, is not for the naked eye.

THE MAGNITUDE system can be (and is) extended upward, too.

Let's start with Polaris (the Pole Star). This is a

typical 2nd magnitude star—magnitude 2.12 to be exact. Aldebaran, in the constellation Taurus (the Bull), is sufficiently brighter to make a typical 1st magnitude star (1.06).

But 1st magnitude was set as the *average* brightness of the twenty brightest stars. Some of those stars are therefore brighter than 1.00. For instance, Vega, in the constellation Lyra (the Lyre), is about 2 1/3 times as bright as Aldebaran, which brings it down to a magnitude of 0.14. Although it is still spoken of as a "first magnitude star", Vega is actually a "zero magnitude star".

There are two stars so bright that one must pass the zero mark and move into negative magnitudes. Canopus, in the constellation Carina (the Keel) has a magnitude of -0.86. It is a star of the southern hemisphere, and never visible north of the latitude of Philadelphia. Sirius, in the constellation Canis Major (the Great Dog), is visible in the north and is the brightest star in all the heavens. It has a magnitude of -1.58, so that it is twice as bright as Canopus, five times as bright as Vega, and eleven times as bright as Aldebaran.

The list of magnitudes must be extended still further into the negatives if we are to consider the planets, three of which are—at one time or another—brighter than the brightest star.

TO BE SURE, Neptune is never brighter than 7.6 in magnitude and Pluto is much dimmer still, so both are invisible to the naked eye. Uranus has a magnitude of 5.7 which makes it visible as a dim "star"; it was, in fact, recorded as such a number of times by innocent astronomers who did not realize they were looking at a planet. It was only when Sir William Herschel, in 1781, noticed that it (Uranus) kept moving against the background of fixed stars, and that the telescope made a perceptible globe out of it, that the fact became obvious that this was not a star. And even Herschel thought that Uranus was a comet, at first.

But the other planets are bright objects. Mercury, the dimmest of the planets known to the ancients, occasionally reaches a brightness of 0.16, which makes it as bright as Vega. (It is nevertheless rather difficult to observe, because it never moves very far from the bright glare of the Sun; thus, even at best and brightest, Mercury is quite close to the horizon behind which lurks the setting, or rising, Sun.)

Saturn, with a maximum brightness of -0.2 is as bright as Canopus, while the other three planets, at their respective bests, are each brighter than Sirius. Mars has a maximum magnitude of -1.8 (1.22 times as bright as Sirius). Jupiter can reach -2.2 (1.77

times as bright as Sirius). Venus, at its brightest, is a spanking -4.1, which makes it just 10 times as bright as Sirius, and almost 6 times as bright as Jupiter. Except for the Sun and the Moon, Venus is thus incomparably the brightest object in the sky.

But how about the Sun and the Moon? Can they be fitted in the magnitude scale? Sure. Why not? The half-Moon is about 250 times as bright as Venus at its brightest which gives it a magnitude of -10.1. The full Moon presents twice the area of the half-Moon and, moreover, is not obscured by mountain shadows as is the half-Moon which receives its sunlight slantingly (as seen from Earth). The full Moon is therefore about 9 times as bright as the half-Moon and has a magnitude of -12.5. The Sun, finally, is 465,000 times as bright as the full Moon and its magnitude is -26.7

THE NEXT step is to calculate how bright the Sun would seem from some point other than Earth. This is fairly easy to do, once we remember that the brightness of an object varies inversely as the square of its distance from the eye. (That is, if the object is three times as close as it was, it becomes 3 x 3, or nine times, as bright as it was; and vice versa if the distance is increased. If my reading light is 3' away, and I move it to 9' distance, I will get 1/9th the amount of light I had before.)

An example— The Earth's orbit about the Sun is not a perfect circle but is an ellipse. This means that sometimes the Earth is closer the Sun than at other times. Since the ellipse is not very far from a circle, the variation in distance isn't very great. On January 1 of each year, the Earth is 91,342,000 miles from the Sun; and on July 1, it is 94,452,000 miles from the Sun. These are the extremes. Working the inverse square business, it turns out that the Sun is 1.07 times as bright on January 1 as it is on July 1. Luckily, this difference isn't great, so that it doesn't complicate the weather situation unduly.

Consequently, we can consider the Sun to be of approximately constant brightness as seen from the Earth. The same is true of almost all the planets, the orbits of which, generally, are ellipses only slightly removed from being circles. There are two exceptions among the major planets, however; Mercury and Pluto. The orbits of these two are so elliptical that there are pronounced variations of the apparent brightness of the Sun with time.

Now we can prepare Table 1, giving the brightness of the Sun as seen from the nine planets. For Mercury and Pluto, the distance closest and furthest from the Sun are both given. For the other

TABLE I — BRIGHTNESS OF THE SUN

Planet	Distance from the Sun (miles)	Apparent Magnitude of Sun	Brightness in terms of Earth's Sun	Brightness in terms of Earth's Full Moon
Mercury (closest)	28,566,000	- 29.3	10.6	5,100,000
Mercury (farthest)	43,355,000	- 28.3	4.6	2,150,000
Venus	67,000,000	- 27.4	1.9	885,000
Earth	92,900,000	- 26.7	1.0	465,000
Mars	140,000,000	- 25.8	0.44	205,000
Jupiter	485,000,000	- 22.9	0.036	17,000
Saturn	880,000,000	- 21.8	0.011	5,100
Uranus	1,775,000,000	- 20.3	0.0027	1,300
Neptune	2,790,000,000	- 19.3	0.0011	510
Pluto (closest)	2,770,000,000	- 19.3	0.0011	510
Pluto (farthest)	4,560,000,000	- 18.2	0.0004	185

planets, only the average distance is given.

AS YOU CAN see from the Table, the Sun's light gets pretty attenuated out past Mars; but even Pluto, at its furthest still gets enough sunligh to make up about 185 full Moons. (Note that Pluto at its closest is closer to the Sun than is Neptune. In the 1980's and 90's it will be in that region of its orbit; and the proper answer to the question "Which is the planet farthest from the Sun" will then be "Neptune"—unless a tenth planet, beyond Pluto, is discovered in the meanwhile.)

In fact, in order to get the Sun down to a brightness equal to merely that of our full Moon, we would have to get out to a distance of 62,000,000,000 miles, which is 13 1/2 times further out than Pluto at its farthest. To get it down to the brightness of Venus, at its brightest as seen from Earth, we must get out to a distance of 3,000,000,000,000 miles (a trifle over half a light year).

Even at a distance of over one and a half light years, the Sun would still be as bright as Sirius appear to us. (However, since Sirius does this at a distance of 8.8 light years, it is quite obvious that Sirius is intrinsically much brighter than the Sun.)

THE NEXT question concerns the apparent size of the Sun, as seen from the different vantage points of the Solar System. To answer

that, let's consider first the units of measurement of such sizes.

By a convention as old as the Babylonians, a circle is divided into 360 equal arcs called "degrees". This holds for a circle of any size, whether it is a circle drawn in a book; a circle, like the equator, drawn about the Earth; or a circle like the Celestial Equator, drawn about the vault of the heavens themselves.

No matter how big or how small a circle is, the radii drawn from the center to the ends of an arc measuring 1/360th of its circumference (1 degree), will form equal angles at the center. This angle is also said to be 1 degree in size.

A degree is divided into 60 sub-units called "minutes". Each minute of arc (so called to distinguish it from a minute of time) is divided into 60 "seconds" of arc. (The use of minutes and seconds as units of both arcs and time is confusing; but quantitative notions of time first arose from the movements of the heavenly bodies through arcs of imaginary circles in the sky, so you can see the connection.)

Now as seen from Earth, the apparent diameter of the Sun averages about 32 minutes. The diameter is greater when we are closer to the Sun, and smaller when we are farther; thus, on January 1, the Sun's diameter is 32 minutes 35 seconds and on July 1 only 31 minutes 30 seconds. It's a safe bet that you've never noticed any difference in size. I know I never have.

THE MOON is, on the average, about 31 minutes 7 seconds in diameter. Nothing else in the heavens, except for an occasional comet, approaches either Sun or Moon in apparent size. Venus, at its closest approach, has a diameter of about one minute of arc; but it then presents its night face to us, and can't be seen. Jupiter, at its closest approach, has a diameter of about 46 seconds of arc. Both are seen as dots of light, whenever visible. A diameter of at least 3 minutes of arc is required for an object to be detected as a globe.

To determine the apparent diameters of the Sun from a point at known distance from the Sun—provided one also knows the real diameter of the Sun, or its apparent diameter from another point—all that is required is some simple trigonometry; but then, into each life some rain must fall.

Sparing you the trigonometry, Table 2 presents the necessary data.

As you see, by the time the outer planets are reached, the Sun is quite a small object. It is only 1/5 the diameter of Earth's Sun when the view is

TABLE 2 — APPARENT WIDTH OF SOLAR DISC

Planet	Apparent Width of Solar Disc	Ratio of Diameter of Disc to That Seen from Earth
Mercury (closest)	1 degree 44 minutes	3.25
Mercury (farthest)	1 degree 10 minutes	2.18
Venus	44 minutes	1.41
Earth	32 minutes	1.00
Mars	21 minutes	0.66
Jupiter	6 minutes 6 seconds	0.19
Saturn	3 minutes 24 seconds	0.11
Uranus	1 minute 36 seconds	0.050
Neptune	1 minute 3 seconds	0.033
Pluto (closest)	1 minute 4 seconds	0.034
Pluto (farthest)	39 seconds	0.020

from Jupiter; and by the time the orbit of Saturn is reached the Sun is certainly at the lower limit of globe-hood. It can just be made out as a tiny sphere.

From Uranus, Neptune and Pluto, the Sun would look like a point of light. From Pluto at its furthest, the Sun would seem no larger than the planet Jupiter does at its closest approach to Earth. Still, it would be a *brilliant* point of light even from Pluto, probably quite uncomfortable to look at directly. Probably no observer, even if he were ignorant of astronomy, could fail to realize that there was something special about this one point of light that was so much brighter than the total brightness of all the other points of light he could see.

~ Next Issue ~

Having set up the basis for his series in the above article, Dr. Asimov starts his examination of the Solar System as Spacemen may begin to see it in the not-too-distant future. Don't miss

POINT OF VIEW: MERCURY

by Isaac Asimov

TIME OF THE TINKERS

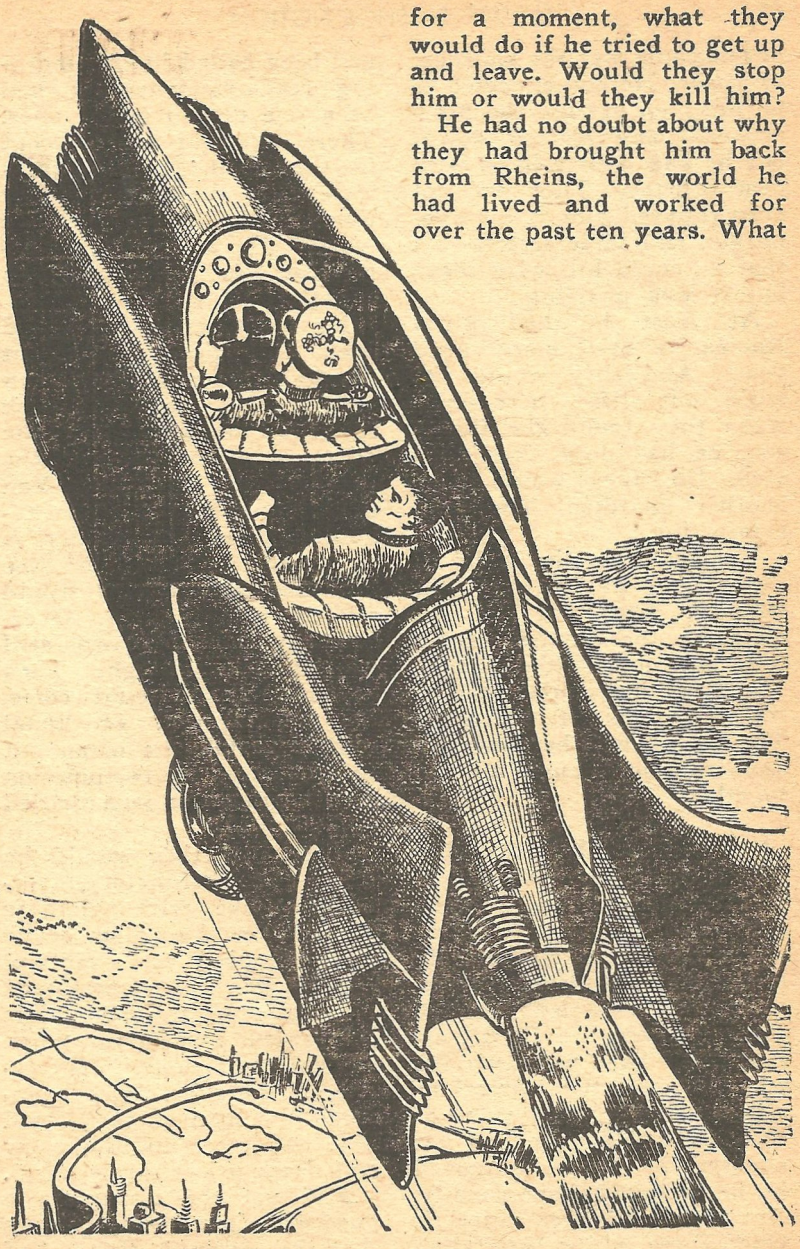
by Joe L. Hensley

The principles taught in the academy for the Guardians of the Law were fine. MacIver had tried to apply them to Rheins, and had aided this world to notable improvement. But MacIver hated the brutal training system, the vicious punishments for slight infractions of the rules. And now, he was being brought back, his work unfinished...

GUARDIAN of the Law, James MacIver waited in the anteroom outside the Dean's Office. Stolidly, he kept his eyes off the two sheriffs who stood nonchalantly near the Dean's door. He wondered,

for a moment, what they would do if he tried to get up and leave. Would they stop him or would they kill him?

He had no doubt about why they had brought him back from Rheins, the world he had lived and worked for over the past ten years. What



puzzled him was the slowness of action. He had expected to be lined up against the nearest wall and blasted down; but he had been treated with near courtesy. They had not even relieved him of his hypno gun and force screen—not that he could kill with them, but it was puzzling.

At least he had given Rheins a few more good years. And they would not wipe out life there—even when they found the things that he had done that deviated. No, they would send another guardian. That was comforting.

He could see the walls of the school outside the big window. They cut off the view of the further world that surrounded the school. The Dean was titular head of the guardians of the Law. The school was headquarters and training ground all put together.

A FEW MINUTES earlier MacIver had witnessed the morning routine that he had come to know so well when he was a trainee. He had seen the students line up, as once he had done, on the grinder below the Dean's office. He had watched the whips punish the infractions against the complex rules of the school. His face had not changed or his body moved as he watched impersonally. But there had been reaction. Once those whips had fallen on his back. Once his name had been called in that morning read-off, when he had been one of the guilty ones. There were no scars except in the mind, but the scars were deep there. How many times had he faced those whips? He had tried to remember, but there was no counting.

He remembered how it had been. They lined you up out on the grinder. A loud siren would shrill from the black tower of dread that was the center point of the barracks and school buildings. You made sure your feet were together—precisely together. A command—and you and the thousand around you would stiffen into rigidity. Overhead it was a dawn still shaped by the night. Then the inspectors would come, the taut sound of metal against metal, the scrape of boots against the composition grinder that the men drilled on.

And then they would be past. A perfunctory, all-knowing eye, with splotches of gold on the collar below it that looked you over and passed by. He remembered his elation on the days when he passed inspection, when he had committed no infraction of the rules. He remembered the hate of the school that had come to him early and deepened—and deepened.

And yet the classes were good and right and the things that he learned there had helped him on Rheins. It was

the things that the school surrounded him with that were wrong.

THE WHIPS were not the worst thing. There were other more subtle tortures, inside the darkened, closed rooms of the black tower. They were the things to be afraid of, for sometimes a man, or boy, did not return from there. Yet the thing he had hated most, was the unclean thing of letting a thousand watch the few be punished.

Once, he had wanted to cry out and attack the punishers—do anything to stop them. But that was when he was very young. After that he had wanted to run—to get away from a place where these things happened. But there was no place to run. When you entered the school you became a part of it. You lost your identity. You gave up the right to see your parents or they to see you. It was a high honor. The school was on a remote planet. The only ships that called there were the ships of the Guardians themselves.

And so, you retreated into impassivity, hating them with a fierce hatred, no less intense by the thwarting of it. And you watched it for the eight years of school. Eight years of watching—from the time you were twelve years old—it was a long, lonely time to hate.

And then one day you reached the end of it. You had become a Guardian of the Law. And the Dean stood on the platform and read his last day speech and you listened and hated. And you looked around at the hundred or so survivors of what had once been a proud four hundred.

Guardian of the Law James MacIver. The sound had a sick taste in his mouth.

NOW, AS HE sat looking out of the office window at the grinder below, along with the remembered hate and distaste, there was something else. He was thirty years old, past the age of youthful impression. It had been ten years since he had been back to the school. Ten years in which he had brought Rheins from a place of savagery up along the road back. It was a long road yet, but it had at least been started. But in watching the scene on the grinder when the whips had begun to fall there was a feeling of wrongness, a note that sounded off key. It was as if he was watching a play where all of the acting was overdone—and he both a spectator and one of the actors.

He sat pondering that for awhile. The sheriffs kept their negligent watch. They were the overseers, the lackeys. They did the school's bidding, kept its regulations; clad all in black, with the scales of justice embossed on

their tunics. Most of them were, in one way or another, mentally defective—not startlingly so, but apparent after awhile.

Once the door to the Dean's office opened and MacIver waited alertly. But then it shut again.

He kept remembering Rheins. They had landed him there and stayed with him for a few days. After awhile the people had begun to gather, a few, ragged survivors of the wars that had racked Rheins. A people that had retreated back into near savagery, that had forgotten the days of the first empire.

And he had taught them—not harshly the way the school had taught him, but kindly and with patience. He had taught them the simple things first. How to do the bare things that kept a race alive, the planting and harvesting. They knew those already, but he had taught them better ways. After awhile he had recruited disciples, who had learned from him and gone out to teach on their own. He had taught them how to build strong buildings to stand the wind and weather. He had taught them that it is wrong to kill, that it is wrong to take that which does not belong to you. At first they had been merely tolerant. Now they respected the laws he had laid down, and they searched his mind eagerly for more things that they could do to help themselves. Two years before, he had unearthed a great cache of books from an underground library. Now there was a school that was already too small. Next year there would be another—and then another.

And they had begun to love him as he loved them. The days of the school had begun to disappear from his mind—for he had found a new home. Then the ship, that he had hoped never to see, had appeared.

THE DOOR opened again. "The Dean will see you now, Guardian MacIver," one of the black-clad men said.

The Dean rose from behind his littered desk, holding out a hand that could be taken or ignored. MacIver ignored it.

After a moment the Dean smiled and sat back down. "Please take a seat, Guardian MacIver," he said courteously. He fumbled among the papers on his desk and finally found the one he wanted.

"You've been recalled from Rheins. There are some things that we want to talk with you about—important things."

MacIver looked into the Dean's eyes. He could see nothing there but a little tiredness. There was no cruelty or kindness, just nothing at all. The face was lined and old, but still preserved well the planes of strength that MacIver remembered.

"You left the school ten

years ago," the Dean said. "You were assigned to the corps, as almost all of those who graduate are. You were given an assignment, according to my information, to a planet named Rheins, on the near edge of the barbarian worlds that we are currently re-integrating..."

A BELL RANG somewhere. It was a loud sound, one that demanded attention. The Dean paused.

"I am sorry. I thought that I would have time to talk to you before I had to attend exercises." He leaned forward. "We have a class graduating today." He got up slowly from behind the desk. "You will please come with me and sit on the platform. I have to make a speech." The Dean smiled. "You may remember it."

MacIver felt his hands clench involuntarily. "All right, sir."

He walked with the old man on out of the room. The sheriffs still guarded the door. They went down the corridor toward the assembly room, the Dean leading, MacIver slightly behind.

As they walked, MacIver's mind raced, attempting to puzzle out the motivation behind the treatment he was receiving. Could it be that they did not know what he had done on Rheins? No—that was impossible. If they had done any checking at all (and he assumed that they must have), then Rheins would not fit the specifications of government that they had taught were ideal. But perhaps their investigators might have thought it *substantially* conformed. The *substantially* was a big word.

For Rheins was a good world. He had known that when he first set down. The air was cold and clean, the earth fertile, though the growing seasons were short. He had been unable to enforce harsh, and sometimes stupid rules on its people, who, in the time of darkness between the crumbling of the old empire many thousands of years before and the rebuilding of the new empire that was still in its infancy, had built themselves an unorthodox, but workable type system of living together. He had always believed that eventually they might catch up with him.

The question was: Had it been worth it?

HE KNEW the answer. A small touch of personal fear came to him. What preyed on his mind most of all was the cat-and-mouse game they had played with him since the ship had landed to pick him up.

He rubbed his hands together, but no heat came. He remembered the little rooms where they had taken him for "tests" when he had been here in school—the almost endless lights and question-

ing, the sleeplessness, that were almost worse than physical torture. He remembered the whip and the thousands of pitiless eyes that watched. He remembered his own eyes, as pitiless as the rest, on those days when he was not among those guilty of infringing the rules—when he had watched some other poor fool whipped.

And yet the things they taught here in school were mostly right. The great systems of law and democracy, with their concepts of tolerance for all. It was the *way* they were taught that was harsh and terrifying, the idea that enforcement, if not possible without force, must be accomplished by the very force that law and democracy abominated. It was like teaching a man to be a priest and then giving him a gun to make sure his congregation agreed with him. The picture was wrong.

THERE WAS a correct posture for sitting too. MacIver and a hundred graduating students sat in that posture. The Dean's voice droned on:

"We have taught you, in your eight years here, what government can mean—we have taught you by the rules you have lived by here and will continue to live by, what we consider a sound sort of standard."

The Dean paused. MacIver was sure that his eyes were directly linked to his own, realing every thought, knowing the disgust and hate there.

"The history of the Guardians of the Law is a short one," the Dean continued. "We were formed about four hundred years ago, when the renaissance began to bring communications back between the millions of worlds of the old empire. Social scientists, searching for a reason for the breakdown of the old empire, decided that a great part of that breakdown could be traced to the fact that the myriads of world governments observed different legal and social codes. What was a crime on one planet might not be a crime on its next adjoining neighbor. With faster than light travel available and much used, this sort of situation was bound to give rise to confusion and hatred. The traveler for business or pleasure who stopped on a planet and found heavy gaming legal there, no enforcement of contractual rights with off-planters, plural marriage or no marriage at all, or found his life in danger because there was no law against the killing of another human, was sometimes more than indignant upon his return to his own planet.

"But it was on the government level that such things brought final chaos and empire-wide war. If one planet treatied with another, accept-

ed the benefits of the treaty, and then failed to carry out their own obligations because the law on their planet did not compel them to, then a dangerous situation could arise..."

THE DEAN lowered his eyes. "Such situations did arise as trade relations grew more complex. Planets fell into the hands of one man, or one group of men, who were more dedicated to serving their own means than those of the empire. The empire hal grown soft from continued expansion, complacent from the thought of its own hugeness. Methods of enforcement, never well worked out, fell into complete ruin.

"And so the collapse. Interplanetary and intersellar wars broke out. For every one that the empire smother, two more raged unchecked. Intrigues within the empire officials, as groups vied for power, contributed. Finally there was nothing but a great group of planets, each holding to its own ways—no trade. The things of knowledge and right were forgotten."

"When the renaissance began four hundred years ago, we evolved a new method of control. Instead of allowing each planet to decide its own method of government, its own social customs, we decided what kind of government was ideal. Our men—you men—control that government. You decide whether a particular practice—whether it be a social or legal one—falls within accepted levels. Many of the things that we have taught you here may seem harsh, but the planets that most of you will be assigned to are barbarian worlds where our standards will seem both light and right by comparison. If a planet fails and refuses to accept the codes that we have set up, and a show of force cannot force this acceptance, then we wipe out civilization on that world and re-colonize from worlds that have accepted us.

"Each of you knows the code we live by, the rules of law and government that we have taught. You will be expected to improvise with the things that we have taught, and build your own particular assignment into a world that can take its place in the community that we are building slowly. We insist that you follow our teachings substantially. We realize that differences in climate, racial background, and a million other factors can lead to slight variances. We will condone slight variances."

He looked out at the hundred faces. "You will be landed on the planet we have assigned you with a great show of pageantry and force. You will be the representatives of the new empire. You will be given certain defensive weapons. You will have

the fleet of the empire at your call as an offensive weapon. All dealings of the planet you are assigned to with other planets as to trade will have to be cleared through you. It will be a lonely and dangerous job. But you, and each of you, will do it. You will substantially conform the planet you are assigned to with the scheme of empire or else we will wipe civilization on that planet out."

The Dean stood quietly on the raised platform. For a long time there was silence while the old man's eyes bleakly swept the room. Then, finally, he turned away. MacIver shivered.

"YOU HAD a difficult situation on Rheins, Guardian MacIver," the Dean said, reading from a report on his desk. "I see here that you lowered the death rate better than two percent."

MacIver nodded guardedly. "It was a strong agrarian civilization. Land clans that lived on and tilled the same piece of ground for generations. There was not enough and that was fertile. To trespass on another's land was death. I changed that."

"How did you do it?"

"Well, they couldn't very well kill me; my screen made it impossible. So I went from clan to clan, showing them improved ways of tilling the soil for more production. Later, after they were used to me, I recruited a number of helpers who did the same thing I had done."

"Broke down the custom, eh?"

"Well, it's not completely gone yet," MacIver said and then stopped, cursing himself inwardly. To tell the dean that was an almost irreconcilable admission that substantial compliance was not being adhered to. "Almost gone, though," he added.

The Dean nodded. MacIver tried to read something in the lined face, the hooded eyes, but there was nothing. "Certainly a small thing like that would not lower the death rate a full two percent," he said.

"THERE WAS some nomadic tribes that fought the land tillers. Once the trespass thing was broken down, because they were growing enough food, they could trade instead of fight. The change was beneficial to both cultures."

He watched the Dean silently. It sounded cold and textbookish when you talked about it now— Rheins; but it wasn't that way at all. A few hundred years before, Rheins had been driven all the way back to savagery by a war that raged through a group of stars four hundred light years wide. To have come back, in a few hundreds of years, to have found stability of culture was more than remarkable, even though the

culture was a bit bloody. It would be ready to take its place in trade with other planets soon.

He almost did not hear the Dean's voice repeating an already asked question. "I said, do they think you are some sort of deity? Do they worship you?"

"No—of course not. I've never attempted to make them think that I am anything but a man from an advanced culture. They have legends of the old empire days, though none of the technology is left and their civilization springs from about twenty survivors. You wouldn't be able to fool them long if you tried to make them believe you were some sort of a deity."

"It has happened before," the Dean said.

MacIver raised his eyebrows.

"Not with the Guardians, but with a similar organization a long time ago." The Dean lowered his head and was silent for a long moment. When he raised his eyes they skipped away from MacIver's as if some reason had occurred, why the opened subject should no longer be pursued.

"HAVE YOU any reason why you are here, Guardian MacIver?" the Dean asked.

MacIver kept his face as normal as possible. "No, sir."

"None at all?" the Dean persisted. "Not twinge of conscience?" He smiled a small smile. "How about Rheins? Does it meet ideal planet classification?"

MacIver said nothing.

"You think you were brought back here to face punishment, don't you?"

MacIver refused to change expression.

"Where is your planet of origin, Guardian MacIver?"

"Edinboro Two."

"A good planet—a most enlightened form of government. Equality for all races and creed, true representative government, well safeguarded by checks and balances." He sighed. "All of the boys that go through this school and others like it come from planets like that. I came from one." He smiled, "there are a great many more planets like that than there once were."

"You were roped in here with a lot of well-done propaganda—men in beautiful uniforms, courteous men—men with a hypnotic quality that not only sold you, but also sold your parents, even though they knew that once you came they could not expect to hear from you again until the Guardians released you. You were brought here in the formative period of your life expecting a great thing, but finding something that was not great, nor even decent. And you learned to hate and to fear and to lie. We taught you to do those

things even as we were taught, and we are proud of it. You saw boys who could not stay within the rules or conceal their transgressions against those rules be punished very severely—sometimes even die."

THE DEAN turned away and went to the window that looked out on the grinder below. "Or did you see that?" he said slowly. "Come here to the window, MacIver. Look out and tell me everything you see out there."

MacIver came slowly out of his chair and to the window. He looked out the window, his face puzzled.

"Go ahead," the Dean said. "Tell me what you see."

"A grinder—some school buildings." MacIver paused. "The punishment tower..."

"And walls a hundred feet high—no tree—no blade of grass," the Dean added. "Most depressing, but very effective."

MacIver continued to look down at the scene below him. The feeling that he had had earlier returned, the idea that the whole thing was a little overdone.

"Those buildings, the walls, the punishment towers, all of it," the Dean said softly, "were done from the master plan that was laid out for us and which we have followed and will continue to follow.

"That plan is over four hundred years old now, and in that four hundred years since the establishment of Guardian law there has not been a major war within the re-taken area. Planets like your own home, Edinboro II, were once planets like Rheins. There's no guardian on Edinboro II now; it will probably be only a few years until Rheins does not need one."

He smiled at MacIver. "Perhaps you would like to meet the culprit who set this plan up, who made ten years of your life a real misery? You'll have to meet him sooner or later—for you will be working here in this school."

MACIVER was dumbfounded. "You want me —here?"

"Our orders were to recall you and to have you teach a course on practical application as you used it on Rheins." He pushed a button on his desk. The wall to the right of his desk slid smoothly and silently back. A great bank of control dials, winking lights, and complex machinery banked beyond that wall for as far as MacIver could see.

"This is the last gift of the first empire," the Dean said. "It could not solve the problem of how to stop the first empire's destruction, for such problem was unsolvable. But, fed with all the knowledge that we can feed into it, it could set up a way that such future wars could be prevent-

ed. And because it has done that job we do not argue with its decisions that conditions here at this school remain as they have been for many years. They are harsh and it is hard on the failures who do not make it. It is even hard on the ones who do graduate. But the fate of billions of people is more important than the discomfort of a few."

MacIver watched the banks of blinking lights in half awe and half anger. "You mean that this machine decides the policies of the Guardians?"

"I AM NOT exactly certain what it does," the Dean said. "Our social scientists and psychologists who have looked at it and seen the history of the Guardians back over the past few hundred years think that it teaches what it wants known by negative application. In other words, you are forced into a course of action here at school which is repugnant to your personality. Yet the rules that you live under and hate actually are the minimum rules that a world can live unler and exist at peace with its neighbors. *Any improvement* in such minimum rules is all for the better. And if you, at any time during your stay here, decide something—or do something—that falls below those minimum standards that the machine has set up, then the machine eliminates you. For example, if you liked the sight of seeing other men beaten, then you would not be a fit subject to be a member of the Guardians."

"And so the machine kills those that do not come up to its standards?" MacIver said bitterly.

"That machine never killed anyone," the Dean said.

"But I saw many of my friends die."

"No you d i d n' t. Your friends merely failed to return from the black tower. They didn't die; some of them are in the recruiting services for the school, others are crewmen on our ships. But none of them are dead—I give you my word on that."

MACIVER looked at the Dean. "I don't know whether I can believe this."

"It's true," the Dean said. "If it wasn't true wouldn't you be dead by now?" He paused and MacIver felt the probe of his eyes. "You violated many rules of the school while you were on Rheins. But your violations were upgradings of what is a minimum standard."

MacIver felt the excitement grow in him. "If this is true then I want to teach here—give the things that I have learned to boys like I was, who will listen and remember and use them. But I cannot understand why the system must remain so harsh, why boys must go out of here

hating this school and all that the Guardians stand for."

The Dean looked away and his voice was so low that MacIver could barely hear it. "I do not understand it myself; but I cannot and will not argue with something that is successful. And the system is successful."

AFTER MACIVER had left, the Dean sat somberly at his desk for a long time. He hated to lie to these people, but that procedure also had been set up by the machine.

His head had ached all morning, and it was worse now. It always was bad when he got a returnee back.

He went to the machine and pressed a much-used button on its panel. In a few moments a message clicked out of the machine. It said only: "No change in proceedure for handling failures at present time."

If he could have kicked the machine then with any hope of satisfaction he would have. But he had kicked it before and there had been nothing satisfying about the pain in his foot.

The deaths of the failures must continue. Some of them could be absorbed as sheriffs after alteration of their minds; some could be put in the recruiting corps, but some of them must die. There was no prison that was escape-proof and no mind could be altered enough to take away all of its memories. You can't alter a boy's mind and then return him to his own people for they will see that something has happened, and the whispers will begin.

SOME DAY, MacIver would have to be told, but only after he began to suspect. Let him put roots down in the school first, let him see the empire, which grew more complex each passing year, continue to live in peace. Then there was a time that he could be told.

For the machine was right and had always been right. No human being shows its instincts and deepest thoughts except at the time of death, or sight of death, or under the great emotional stresses that the school forced. The machine ran the school and the school turned out no dictators, no petty Gods; it turned out only men who hated it and yet had learned to live above or at its minimum standards.

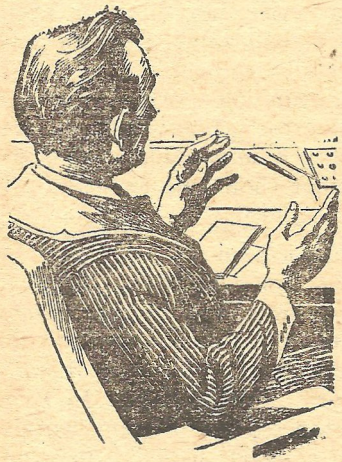
The Dean sat back broodingly in his chair. His own friends had died—many of them. Time after time he had come into this office prepared to tear the roots out of the machine that sat imperturbably behind its vast panel. But he had not. He suspected that even if he tried he would not succeed, but that was not the reason he had not done it.

For you cannot argue with success, no matter how erra-

tic and wrong that success is. You build a machine to do a job to save a billion billion lives and the machine does that. And along the course it takes a few lives of its own. The machine builds clean, good worlds, and it builds them with the lies that it forces others to live by, it builds them in the unclean atmosphere of a school of fear. But it builds them. Who, then, do you worry about? The few or the many?

There was really only one answer. The Dean put his head back in the chair and tried to sleep. For sleep sometimes cleaned his mind of the blood in it and he could awake refreshed and with confidence renewed.

But, then again, mostly he could not.



Editorial

YESTERDAY'S WORLD OF TOMORROW: 1928 II

AS HAS BEEN indicated in previous installments of this series, the scientifiction story with serious scientific or logical flaws was not unknown in Uncle Hugo's glorious days. However, something new was presented with Geoffrey Hewelcke's "Ten Million Miles Sunward", which lead off the March 1928 issue of *Amazing Stories*. (Unless otherwise specified, all stories mentioned in this section come from *Amazing Stories*, March or April 1928, or *Amazing Stories Quarterly* Spring 1928.)

After praising the story's cleverness, the blurb writer* ends with, "Frankly, though, there is something wrong with the story. See if you can find out just what that 'something' is."

Briefly, the story deals with an attempt to alter the Earth's orbit, in order to avoid collision with a comet (yet again! Well, it wasn't quite so hackneyed in 1928.) This is not the "something wrong". The plan is to flood the Caspian Sea, which requires a tremendous ditch-digging job. Dr. Gant explains:

"... The Caspian is eighty-six feet below the level of the Mediterranean or the Black Sea. A gigantic canal cut for three hundred miles, from the Black Sea to the Caspian, would raise the latter to its former level and submerge, in addition, a very large area of land, surrounding it."

THE ASSEMBLED experts have pretty much agreed that the transfer of about "thirty million million tons of matter for at least three hundred miles" would result in shifting the Earth's orbit sufficiently to avoid collision with the forthcoming comet. The story fully lives up to the editorial promise of being "absorbing", and the readers were assured that "next month" the explanation of what was wrong would be forthcoming.

This seems to me to be an entirely defensible practice, if not overdone. When marvels are not multiplied to the point that either anything or nothing is believable, you can have a really enjoyable and plausible-sounding story—even with one error which would, in fact, make it impossible. —But the reader should be warned.

The "find the error" story has not been too frequent since this first specimen, although there was Roy Avery Myers' "Into the Subconscious" in the October 1929 *Science Wonder Stories,* for example. In some instances, an author worked out a good, logical story, unaware of its fundamental flaw; and the editor accepted it with the idea of using it to test his readers' scientific knowledge. In other instances, the author planned it that way in advance. But most published specimens of science fiction containing such clinkers were written and published with author and

*Probably T. O'Conor Sloane, Ph. D., who did much of the editorial work on *Amazing Stories* during this period, as did Sam Moskowitz on *Science Fiction* + in 1953. Mr. Gernsback, of course, had the final say as to whether stories were accepted, and often worked out plots, etc., with authors. But Dr. Sloane's style is evident in many of the blurbs and the editor's comments in the letter section.

editor unknowing, or uncaring, or both.

"Lakh-Dal, Destroyer Of Souls", which was the cover story for March, is notable for its variety of horrible and wonderful rays; the story is far too much of a melodramatic silliness to warrant examination on grounds of plot and style, but Dr. Macklin will probably want it for his article on rays in science fiction, so I'll let it alone. However, the use of weird rays as torture devices had a long and inglorious career. I'm partial to the ones on George Paul Bauer's "A Subterranean Adventure" *(Wonder Stories,* June, July, August, 1930). The first when played upon the victim's eyes, made them expand until they burst...

CHARLES CLOUKEY'S "Sub-Satellite" was the first tale to have a villain foiled and done in by a bullet he fired at the hero.

Consider the tremendous power of the Marvite gun. Long ago men calculated that a bullet shot from a gun with a muzzle velocity of 6,500 feet a second would, if there were no obstacles in its path, completely encircle the moon! And that is what happened! One of the bullets Duseau shot from the summit of "Mount Olympus" traveled all the way around the moon, and hit him in the back!

The author doesn't say how long this took, but he does say that Duseau (not entirely *compos mentis)* was up there on "Mount Olympus" with a Marvite machine gun, firing at random, apparently for some time. At any rate, now you know how moth-eaten that gag is.

IN THE APRIL issue, Prof. W. J. Luyton (at the time) of Harvard College Observatory, Cambridge, Mass., explained the fundamental flaw in "Ten Million Miles Sunward":

"Astronomically speaking, the thing is totally unsound; it is entirely impossible to change the course of the earth (I mean in its path around the sun) by doing anything from the earth itself. To change the earth's orbit would require a force coming from the outside. At the most, we could do a little toward it by breaking the earth in two, then the two bits might very well pursue another orbit. The fundamental law of mechanics is that the centre of gravity of the earth will remain in its orbit *so long as only interior forces act,* and in the case of the Caspian adventure we are dealing with a purely interior force. Besides, the shifting of

the centre of gravity on its account would be very small.

If the water flowed from the Black Sea into the Caspian at a tremendous rate of speed, it might for the time being slow down the *rotation* of the earth a little and make the day a few seconds longer, but would have no further effect. After the Caspian had been filled up the rotation would come back to practically the same value it had before. Also, in such a case, if the earth swerved at all from its course, it would do that gradually, and not suddenly...

THE APRIL issue is also noteworthy for being the first science fiction magazine to have a symbolic cover. Frank R. Paul, who painted all of the covers, (and drew a majority of the interior illustrations) for *Amazing Stories*, the single *Amazing Stories Annual* (1927) and *Amazing Stories Quarterly* from the issues of April 1926 through April 1929, symbolized "Scientifiction" as a huge eye. And Editor-in-Chief Gernsback offered $300.00 in prizes for a symbol for "scientifiction" which could be run on each cover as a sort of trademark.

With Volume 3, Number 1, most of the stories were new, only the two serials (Wells' "Story of the Days To Come" and Gernsback's own "Baron Munchausen's Scientific Adventures") being reprints."

"The Yeast Men" by David H. Keller, MD, is the first of a basically-fascinating category in science fiction; and it ought to be good so long as human beings have resort to warfare. It is the story of the war-winning weapon which (a) does not seem to be dangerous at all (b) does not kill (c) makes it impossible for the enemy to start or continue hostilities. (The first item isn't requisite, but the other two are.) The list of stories which would fall into this category is too long to think about, but by no means too long, as each one requires a new idea. Just to mention a few:

The device which broadcasts some sort of wave, or whatever, so that anyone who so much as thinks of making war, or engaging in lethal activities against his fellow man, gets a splitting headache ("The Master Minds of Venus", William K. Sonneman, *Amazing Stories*, September 1934); the device which disintegrates paper, so that the enemy's communications, records, and general organization are *kaput* ("The Perfect Weapon" Poul Anderson, *Astounding Science Fiction*, February 1950); the otherwise harmless gas which makes it impossible for anyone to say anything he knows to be untrue ("The Awful Weap-

on", Alfred Coppel, *Future combined with Science Fiction Stories,* May 1951).

THE YEAST MEN, when full grown looked like:

...a six-foot man of dough, with a crust hard enough to hold it erect, yet viscid enough to allow it to move forward. A creature with a head but no face, with spade-like hands without fingers, and instead of two legs and feet, simply—simply a body like a skirt, which rested firmly on a two-foot base. It was the convulsive movement of the base and the mass of fermenting yeast above it that in some way enabled it to move s l o w l y along the ground.

Shot out of guns, these little blobs of yeast started moving slowly across the enemy terrain. But what did they do? The inventor, Billings, explains:

"...I have tried to make that plain to you. They die and rot."

"You mean they decay?"

"Exactly. They dissolve into pools of slime. They form a puddle about three feet in diameter and weighing about thirty pounds."

"How would such decaying masses stop an invading army?"

"It is the stench that will stop them. The yeast is mixed with the culture of Bacillus Butericus and other foetid germs. Those grow in the dying and dead yeast, and produce the smell."

THE KING of Moronia seems dubious, so Billings calls for a volunteer to take a couple of sniffs from a bottle containing one thousandth of a drop of decaying Yeast Man. The volunteer gets deathly sick at once and is clearly incapacitated. The stuff also kills plants.

It all sounds somewhat dubious, no doubt, but the author has sagely refrained from telling us exactly how the Yeast Man is made, so we'll have to allow him his magic. (Just as well, too; if Dr. Keller has any ideas, better they should not become public knowledge, lest someone shoot them over here before we can shoot them over there.) All we know is that they grow and moved (and any which are cut in pieces grow and move) until they have attained full growth—about six feet—in a matter of three days.

Needless to say, Eupenia has no idea that these harmless-looking creatures are dangerous. They make good bread, too. So, all Eupenians are encouraged to make pets of the Yeast Men.

Three days later, Eupenia is

prostrate and those of its citizens able to move are fleeing for the hills...

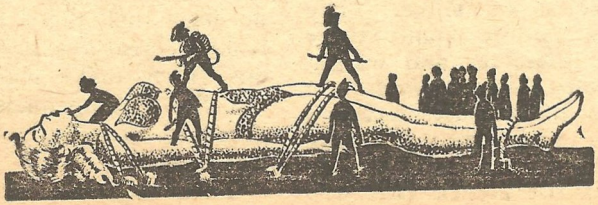
CLARE WINGER HARRIS' "Miracle Of The Lily" was the first story that goes like this: men get in "Radio" contact with intelligent creatures of another planet; friendly intercourse follows, and we learn that this other world is plagued with insects. Our aid is implored. At the end, video communication is established and we learn that the beings on the other planet are insectoid and the "insects" they want us to help destroy are human.

It was rather good, the first time...

The Spring issue of *Amazing Stories Quarterly* featured "A Modern Atlantis" by Frederick Arthur Hodge. This is not an "Atlantis" story but a novel of espionage and threatened war, taking place on an artificial island. In 1928, these structures seemed to be a likely thing for the future—mid-ocean ports for ships, with landing space for planes—and photos of Edward R. Armstrong's model and drawing of such an island made it look quite feasible. But the airplane carrier ship made the artificial island obsolete before one could be built, just as the subway and surface bus made the equally plausible-seeming "moving sidewalk" obsolete before any were made.

No need to discuss Homer Eon Flint's "Nth Man"; we've covered the reasons why he's nonsense in discussions of giant ants, etc. The square-cube law and the mass-weight ratio make it impossible for anything that size to look like a human being, or to carry its own weight, despite the author's glib talk about glands. (The blue whale is the largest living animal known, past or present; a full-grown specimen could not live out of the water, even in an oxygen tent.)

As we go on with 1928, you'll find more evidence of how much we take for granted in science fiction made its first appearance in its earliest years.



THE BACK OF A HAND

by Theodore L. Thomas

The Earth Colony on Canopus Six was doing very well — nothing wrong with it at all. And that was the trouble — why? All the other colonies had all kinds of difficulty...

THE ADMINISTRATOR shoved back a huge sheaf of papers, pushed a button on his desk, and roared, "Conners, to me." Then he sat back in his chair and began drumming his fingers on the desk top.

There was a hesitant knock at the door. The Administrator glared at it disgustedly and shouted, "Come in." A young man slipped in through the door and closed it quietly behind him. Then he crossed the large office toward the Administrator making an obvious effort to be quick, quiet, and pleasant.

"What kept you, Conners?" snapped the Administrator.

"Sorry, Sir. I was in the files in the..."

"Never mind the excuses. Why haven't I been informed about Canopus Six?"

"Canopus Six, Sir? I don't understand. What is..."

The Administrator's ham-like hand banged down on the desk top with a sound like a small explosion. Conners visibly jumped. "By Gad, Conners. What's the matter with everybody around here? Doesn't anybody use his head for anything besides wearing a hat? Do I have to do everything? You don't know about Canopus Six, eh? Well, I'll just show you."

THE ADMINISTRATOR pulled a file off the top of the huge sheaf of papers and opened it. He lifted the top

sheet of paper out of the file, threw it across the desk at Conners, and said, "Read that."

Conners caught it before it fell to the floor and started to read. He tried to read fast, so the Administrator could not accuse him of being slow. He tried to read thoroughly, so the Administrator could not accuse him of being slipshod. The result was that he could not read at all. Halfway through, with his mind in a turmoil, his eyes dropped to the last sentence in the report. Its meaning penetrated just as the Administrator lost patience.

"Well, well, well, Conners. What about it?"

"It seems to be a well-balanced planet, Sir."

The Administrator stared at him in surprise. "By Gad, Conners, you *can* read. All right, it's a well-balanced planet. What does that mean to you?"

Conners stared at him blankly.

THE ADMINISTRATOR leaned forward and planked his elbows down on the desk. He put his face in his hands and a muffled "Oh Gad" squeezed out between the fingers. Then he reached out and pulled the entire pile of papers toward him. He lifted off the top file and said, "Deneb Two, planetary war raging, got fifty of our agents there trying to stop it." He lifted off the next file. "Castor Four, in a planet-wide depression, ten agents there to help pull them out of it." The next file. "Capella Three, health problems, four agents."

On he went through the files. "Rigel Five, trying to pull out of the Galactic Union, six agents. Altair Three, getting ready for war with Altair Two, eight agents. Spica Seven, lackadaisical, two agents. On and on it goes. One hundred and eighteen planets we've colonized from Earth so far, and every one of them has troubles, big troubles. Except one.

"One little third-rate planet runs its affairs better than we do here on Earth. Canopus Six. On Canopus Six business is good; people are content and happy; there's no war or threat of war, and they are advancing at a prodigious rate. One planet—and not a very good planet at that—seems to have what it takes to get along well. One planet out of one hundred and eighteen. Now does that suggest anything to your feeble brain, Conners?"

Conners stared at him a moment, and then just before the Administrator unleashed a remark, Conners said, "Yes, Sir. Let's find out how they do it and then have all the other planets do it too."

The Administrator's voice was softer. "By Gad, Conners, you are coming along. That's

very good. Now tell me. Who is our best team of available agents?"

"Well, I can't say offhand. I'll have to go look it up."

The resulting roar forced Conners back a step. "Look it up! Don't you know anything about what's going on? You're supposed to have these things at your fingertips. I'll give you just three minutes to find those names. The best, mind you. The best team we've got available. Go."

CONNERS went, sacrificing quietness for speed. The Administrator sat back shaking his head slowly from side to side. A buzzer on his desk sounded.

He reached out and touched a button. A crisp feminine voice said, "Your wife is on the phone, Sir."

The Administrator looked at the clock. Two-thirty, time for the third daily call. He took a deep breath, blew it out, and flicked a switch. The small screen came to life and showed a large-jawed woman sitting in a deep-cushioned chair. "Yes, Dear," he said.

She talked, while the Administrator nodded. She listed half a dozen things that had gone wrong since the last call. She described half a dozen recent stupidities of the children. She stated half a dozen errands for him to run on his way home that evening. Then she refreshed his memory concerning the information she had given him during the day's two preceding calls. He nodded his head while she talked.

Conners burst into the office without knocking, a little behind in his alloted three minutes. Since his wife had paused for breath, the Administrator nodded to her pleasantly and said, "Fine. I'll call you later, Dear." He turned off the switch, looked up at Conners, and took a deep breath.

Conners saw it coming and began to talk quickly. "We're in luck, Sir. One of our best teams has just finished an assignment. They are resting now and won't like going out again so soon; but, at least, they are available. Here's their file, Sir. I knew you'd want to look it over and see for yourself."

CONNERS put a file into the Administrator's hands. Thus distracted, the Administrator glanced at the names on the front of the file and read *David and Jean Weaver.* He had heard of them; he had heard many things, most of them good. He glanced up at Conners and said, "Have the Weavers report here tomorrow morning first thing."

"They are vacationing in Mongolia, Sir. I may take a little time to locate them and get them...". The Administrator's head came slowly erect and his nostrils flared. Conners' eyes widened and he

said hurriedly, "Yes, Sir; yes Sir. They'll be here in the morning." And he turned and fled toward the door, once again sacrificing quiet for speed. The Administrator began to read the Weaver dossier.

Good physical specimens, both of them. He stood six feet and she was only an inch shorter. Both were lean, with the piano wire-type build, and both had red hair. Each was a skilled technologist in several and different fields of science, both physical and social. *Humpf*, thought the Administrator, good background.

He turned to Personality Evaluation and read on. David Weaver was generally a slow-spoken man although his mind functioned swift and true. His patience was good; he could bide his time until the right moment came to do the things that ought to be done. Jean was different. She was quick-spoken and volatile and ready to act right now. In fact it was Jean more than anything else that tried David's patience.

The verbal battles between the two were famous; even the Administrator had heard of them. About the only time that David broke out of his shell of deliberation to talk fast and loud was when he and Jean were having one of their arguments, which was often. But the one seemed to balance the other. The result of the relationship was that the combined efforts of the two of them seemed to produce the desired results in the end.

Humpf, thought the Administrator. David and Jean Weaver might be just the team to find out what was going on on Canopus Six.

"I DON'T know why you don't stand up for your rights," said Jean. "We were entitled to a three-month rest."

"I didn't hear you standing up for much of anything," snapped David.

"I thought you were going to do it."

"Oh, stop it. You never in your life heard anybody stand up to the Administrator."

"That old tyrant. You're afraid of him, that's your trouble."

"Look, Jean, stop it; you've done nothing but complain this whole trip. Let's talk about Canopus Six; we'll be there soon. Anything we missed so far?"

"Don't try to get me off the subject; you're afraid of him. And no, we haven't missed a thing. We've been over everything that has ever been written or said about Canopus Six. I might also add that we don't know a thing more than we did when we started."

"That's all right, that's all right. We'll find out what's going on after we get there."

"Well, we always do. But we shouldn't even be here. If

you had only stood up for your rights we would not..."

THERE WAS a knock, and the tiny door flew open. The purser squeezed in and said, "Coming-out in five minutes, folks. Strap yourselves in, please." He waited and checked the straps. Then he touched the visor of his hat, said, "Pleasant landing, folks," and went out the door, pulling it tight behind him.

"Won't be long now," said David.

"I hope not," replied Jean.

A low, whining sound filled the little room, seeming to come out of the very walls. It mounted slowly in pitch while they listened, fascinated, waiting, as it rose higher and higher. The sound posed for a moment at the top of human hearing and then suddenly passed beyond. There was a breathless instant of eternity, then the colors of the cabin flashed down through the spectrum into a perfect black. There was a violent twisting sensation, a spinning, and then with frightening suddeness everything was back to normal.

David and Jean Weaver lay and stared at the low ceiling while they oriented their senses. David shook his head and said, "I'll never get used to that." And he slowly began to unstrap himself. Once out, he helped Jean release herself.

"Let's go watch them juggle into orbit," said Jean.

"Good. I also want to get a good look at Canopus Six before we land. Who knows, maybe we can learn something."

Hand in hand they squeezed out into the corridor and went to find a viewport.

EIGHT HOURS later, they stepped out of the shuttle and set foot for the first time on Canopus Six. Eagerly they looked around, seeking with trained eyes to create what they had learned was so important in their work—an accurate first impression. They breathed the cool air deeply and drank in the sights and sounds.

Directly below the platform on which they stood was a moving belt that travelled silently into a low-lying building that was obviously the Customs Building. Men worked on the concrete apron in front of Customs, handling freight, inspecting papers, tinkering with engines and equipment, doing all those things that have to be done to keep a busy spaceport in smooth operation.

Above and beyond Customs lay the city. The buildings were broad and not so high, clean-looking, with spotted shining rows of windows that gleamed in the afternoon rays of the sun Canopus. The buildings were all tinted in soft pastels calculated to absorb the heat of the distant sun and to present a pleasing

effect to the eye. The deep-blue sky was flecked with patches of downy clouds and sprinkled with slow-moving aircraft in flight.

To the right and left of the city the broad buildings gave way to groves of trees underlined with soft grass. Glistening ponds and whitish ribbons of walkways gleamed in the cool green of the grass.

David turned to face Jean and she looked at him. He shook his head and she nodded, and they turned and went down the ramp and stepped onto the moving belt.

IT WAS THE same thing all over again, and they both felt it. Men leave Earth and go to a far-flung planet and settle there. In the course of time, a new civilization appears, nourished on a fresh young bosom. Yet the tie-strings of Earth are strong and they reach out and enfold the children in a tenuous web of culture and tradition. And when the sturdy youngster reaches maturity he often—so often—turns out to be the image of his Mother. David and Jean Weaver got their first impression of Canopus Six clear and sharp. The impression was that of Earth; Canopus Six had the feel of Earth about it.

The Weavers walked up to the counter in the Customs Building and gave their name. The clerk's face lighted up and he said, "Oh yes. We've been expecting you. Just a moment, please." He picked up a phone and talked softly for a moment. He hung up and said, "We have appointed a man to guide you around and make your stay as pleasant as possible. He'll be here in a minute. Now let's clear your baggage."

The check was swiftly completed and the luggage was piled onto a servocab. David glanced through a city directory while they waited. Just as the last piece went on a young man came up to them. He was tall and at first glance he looked skinny. Closer scrutiny showed that his neck was big and his chest deep. The shoulders were broad but they sloped and so subtracted from the appearance of breadth. The eyes were blue and far apart and wide, and they snapped with a perpetual twinkle. He stepped up to them and held out his hand and said, "My name is Peter Downes and I'm supposed to do what I can to help you while you are here."

JEAN TOOK his hand and shook it, saying, "I'm Jean Weaver and this is my husband David. We are glad to meet you, Mr. Downes."

Downes looked at her strangely and then shook hands with David. Downes said, "I have made reservations for you at a hotel nearby. Perhaps you'd like to stay

there until you find a place you prefer more."

"That sounds fine to me," said David. "Thank you."

"Good," said Downes. "I see you are all ready, so let's go."

They climbed into the servocab and Downes dialed the address. On the way, he pointed out various sites of interest in the city. When they arrived at the hotel Downes made the arrangements that quickly settled them in a suite of bright and cheerful rooms. Then Downes said, "Well, you probably want to rest a bit after your trip. I'll pick you up in three hours for dinner. We can talk then about your plans and how I can help you." He waved and went out the door.

THE INSTANT the door closed David and Jean leaped over to it and pressed their ears against it. As soon as they heard Downes turn the corner they slipped out the door and headed in the opposite direction down the hall. They found another escalator to the street and hailed a servocab. David dialed the address of the public library and sat back to wait.

"Well," he said. "What do you think?"

"I don't know. He might really be someone assigned to help us; but then again, he might be assigned to steer us to the things they want us to see. This is the best way to find out."

David nodded. He and Jean had worked out this little stunt long ago. People always assume that travellers are tired when they arrive at their destination. Custom everywhere demands that the travellers be given a few hours to rest up; no one expects them to launch out immediately on their business after a long and arduous journey. But by doing just that, the Weavers had found that they could dig up information on their own and then contrast that information with what they were shown later. In that way they could check on how candid their guide was.

They arrived at the library and went right to the Reference Room. Each swiftly scanned through books of his own specialty, making an occasional note as he read. Half an hour later they switched to the technical reading room and did the same thing.

AFTER ANOTHER half hour, David said, "That's enough here. This city is a prominent spaceport. It must have some fuel processing plants around. Let's see if we can learn anything at one of them."

Jean located a directory and looked up the nearest fuel processing plant. They climbed into another servocab and soon arrived. They wan-

dered into the working portion of the plant, keeping clear of the well-marked hazardous areas. An occasional foreman came over to them to explain a particular phase of the operation, but other than that no one bothered them, no one questioned them.

Jean glanced at her watch and said, "We'd better get back. Downes will be showing up soon."

In ten minutes they were back at the hotel. They returned to their suite the back way and just had time to throw cold water on their faces when there was a knock at the door. It was Downes. "Feel better?" he asked.

They said they certainly did.

"Look," said Downes. "I'm on an expense account for tonight and I'm supposed to spread the red carpet for you. Let me pick the place to have dinner and let me order for you. I don't get a chance to eat like this very often and I'd like to run wild, if it's all right with you."

There was something in the way he said it, an earnestness, an eagerness, that struck the Weavers funny. They laughed, and when they did a bewildered look came over Downes' face. Instantly Jean put a hand on his arm and assured him that they would be delighted—that they weren't used to such treatment themselves. Downes' face cleared and he stepped over to the phone and called a restaurant and made reservations and ordered dinner.

THEY STOPPED for a drink in the hotel bar and then went on to the restaurant. Dinner was delicious; the three people got along famously. During dinner Downes made it clear that his government was as anxious as Earth to find out what it was about Canopus Six that made it different from the other planets.

The Weavers were surprised at the reaction. They had known that the decision had been made to inform the government of Canopus Six of the purpose of their visit; the agents always operated openly where possible. But nevertheless governments often do not like to have their affairs investigated no matter how friendly the purpose. Yet Canopus Six seemed to be in complete accord with the goal of their visit. Such cooperation might be just another instance of the excellent balance of the planet. Or maybe it was just a sham.

The Weavers talked it over in their rooms after the evening had ended—talked it over under the covers where no prying microphone could reach. They decided to go ahead with their testing of Downes just to prove to themselves that he was what he said he was and not a counteragent to keep them away from something.

The next morning they asked Downes to show them the public library. He took them to the same one they had visited the afternoon before. Then they asked to see a fuel processing plant and Downes took them to the same one and guided them around and showed them things they had not seen the day before.

A glance between the Weavers confirmed what each was thinking—Downes seemed honest, and they would trust him until they had reason to do otherwise. Then they got to work.

With Downes to smooth the way they started by interviewing several of the leading scientists in the physical sciences. By the time they had finished they were calling Downes by his first name, but they had learned nothing toward solving their problem.

THEY SWITCHED to the leading social scientists and again got nowhere. Their travels took them far and wide over the entire planet and everywhere they went they saw signs of happy, contented, and efficient people, but they could find no particular reason for it. A month passed.

David and Jean were back in their hotel suite, talking. The big question was—*where do we look next?* Jean wanted to start detailed analyses of the foor, air, and water on the planet. David wanted to look very closely into the operation of local government.

"Look," said David. "If there were anything chemically different on this planet, the scientists here would have found out about it long ago. They know what it is all about. Why do you want to waste time repeating their work?"

"It isn't a waste of time. No one has actually made a detailed comparison before, looking for a difference. Waste time? This stupid idea of yours is the time-waster. What can you possibly gain by inspecting local government? Ridiculous."

David's face flushed and his voice rose a little higher. "Use your head, will you? You're not going to find what we're looking for in chemistry. Don't be so bull-headed about it. If you'd just..."

"Bull-headed! Don't you call me bull-headed, Dave Weaver. You're just being stubborn because you can't have your way. You're acting like a spoiled brat. You can't even think straight anymore and you try to put the blame for your stupidity on me." Jean was shouting.

"That's the second time you've called me 'stupid' and I won't have it. Just who do you think you are?" David's voice was loud, very loud.

"I'll tell you who I am. I'm the only one with sense in

this room. Of all the stupid, incompetent..."

There was a knock at the door. David strode to it and angrily flung it open. Peter Downes stood there. The twinkle was gone from his eyes; his fists were clenched at his sides. "David," he said in a low voice. "David, may I speak to you alone out here in the hall for a moment?"

David stepped out and closed the door behind him.

THE ADMINISTRATOR sat at his desk, scowling at an unfavorable report from Rigel Five. There was a loud crash and the door burst open. The Administrator looked up and saw David Weaver standing in the doorway holding a large bundle of files in his arms; he had obviously just kicked the door open. The Administrator took a deep breath to say a word or two to Weaver, but Weaver spoke first.

"My wife here yet?" he asked. Then he glanced around the office and said, "Well, she'll be along in a minute." He walked toward the Administrator and dropped the pile of files on the edge of the desk.

"All right," he said, cutting off the Administrator again. "I've got the complete answer on Canopus Six. It's all here." And he waved at the huge bundle of files.

The Administrator choked off the words that were rising in his throat, looked first at the pile of files and then at Weaver, and said, "You've got it? The answer? Good man, Weaver. By Gad, good work. Tell me about it."

Weaver put one hand on the edge of the desk and the other on his hip. "Well," he said. "It's a very simple thing and it will be kind of hard to believe. That's why we stayed a year and gathered all these data." He waved at the pile. "You probably won't believe it until you've gone through all of this."

"Tell me what it is."

"Well, Canopus Six all along has had a custom that died out on Earth a thousand years ago. That one custom is the cause of everything that is good on the planet."

"What's the custom?"

"LOOK HERE." Weaver picked up the top file and glanced at the label. "This shows how the custom eases all the tensions that can exist in life in the home." He slapped it down in front of the Administrator. "This one," he picked up the next one, "shows the beneficial effect of the custom in raising children." *Slam*, it went down in front of the Administrator. "This one shows how it smooths out community life." *Slam.* "This one proves it reduces the accident rate in every phase of life. This one shows the effect on religion. And this one..." he lifted the

biggest of all—"shows how the custom increases the efficiency, speed, and cooperation of the people who work in offices and factories. All tensions of life eliminated, that's what the custom does. Here's the file that shows the effect on government." And that last file slammed down on top of the heap.

"By Gad, Weaver. Will you tell me what this custom is?"

"Wife-beating."

"*What?*"

"Wife-beating."

THE ADMINISTRATOR roared up out of his chair. "Weaver, I'll break you for this. How dare you come in here with this ridiculous and purile joke. I'll see that you..."

Weaver reached across the desk, placed a hand on the Administrator's chest, and pushed. The Administrator flopped back into his chair.

"Now look here, my good fellow," said Weaver. "You turn your analysts loose on these data before you start yelling at me. I'm telling you straight, the custom of wife-beating has a profound effect on a culture, all good. You have any idea what it means to a man to take a job he likes and keep it without having some woman nagging at him, pushing him on? You take good men, and keep the women off their backs and the world is their oyster. Wife-beating does it. And here's one more thing." Weaver slammed a single paper down right on top of the pile. "There's our resignation. We're through."

"You...you..."

"Never mind the arguments. We're going to live on Canopus Six. Maybe I'll see you there some day—after you've had the opportunity to study these files. You just..."

A soft voice spoke from behind Weaver. "Shopping's all done, darling. I'm ready anytime you are."

They turned and saw Jean Weaver standing in the doorway. She looked radiant. The very room became filled with the warmth and love that glowed in her eyes, even though one of them was blackened.

★

Do You Agree With The Majority?

The ratings of stories in our last issue represent the majority opinion of those readers who took the trouble to let us know. In some instances, just one vote can make a substantial difference, when the race is close. So your vote — whether by coupon, postal card, or letter — really counts. Why not send it in today, and join the elect in electing?

PCM1

by Walter Maneikis

Their IQ's were impressive, but their social responsibility virtually nil—that is why these men were leaders of the penal colony. And they put on a big show of constructive scientific research, but . .

"WELCOME, gentlemen." Hitchens bowed at the waist and pointed his finger at the wall behind his desk. *WELCOME* glowed in red. After the light disappeared, there was no sign of tubes or wiring. "A new gadget to amuse the boys."

"This is Dr. Jerome Wald." The inspector gestured at an eager young man who had just flipped off his helmet. "Jerry, Mr. Hitchens."

"I've heard about you." Wald shook hands. "I took the liberty of reading up on your career."

"Your successor, I presume?" Hitchens arched his eyebrows at the aging inspector.

"A candidate." Helmut Darin sighed wearily. "He just has picked up his Ph. D. in applied observation. Before that, he had a brace of them—one in chemistry and another in physics. Watch your step."

"Ha! Ha!" Hitchens, a florid, self-satisfied man with a handsome head of graying hair, patted Wald on the back. "You're young and unwrinkled—not the taciturn visage of our angular friend Dr. Darin." In a glance, the head of PCM1 appraised Wald. "I'm certain we shall get along famously."

"If you don't mind, we'll take our suits off and retire for a while; the braking process was a bit of a strain."

Without listening to the deluge of words, which the chief knew by heart, Hitchens led his younger colleague into an underground room, off the reception center. Finding a cot, he struggled out of his envelope.

"Where did the crew go?"

"They're shunted off to Level 3. Hitchens is hardly democratic. In fact, he runs a tight little Nietzschean state, ruled by the wily and the clever, muscled by the goons he has working under him in the shafts and machine shops. He drinks his ersatz champagne, and they get their ersatz beer." Darin laughed shortly. "He says the beer dulls the faculties of the submen and encourages them to work."

"I'VE READ everything I could lay my hands on, but..." Jerry Wald began.

"But you will learn." Darin nodded. "I'm not supposed to tell you anything except that, for all practical purposes, you are head of this visitation." With apparently aimless gestures of his fingers he flashed a message: "We can't talk freely here. Watch your own step on this globe and take your cues from me." He hoped the neophyte would not be influenced by the bland facade.

"I'm ready to start the inspection." Wald jumped up from his cot and looked around the bare cubicle. "Back to the reception room?"

"The protocol is that Hitchens will meet us with his aides and take us around to explain things. We may abstract what information we wish from them, if we can get it." Darin smiled. "Don't worry that anybody will overhear. The ruling powers on this satellite are aware of more than I can relay to you anent this topic. Hitchens made billions; Zegerian once owned the power to start a chain reaction that could have cracked Earth wide open in at least two ways; Procis has connections on the home planet and could exterminate the head man with impunity and take over—but his influential relatives would have to disown him. Without their aid, he might be helpless."

"I guess I'll have to learn by feel," Wald said.

REFRESHED, they entered the reception room, a windowed portion of the outer blister of PCM1. There, suave and sleek as before, Hitchens introduced Wald formally to the other two of the triumvirate.

"Dr. Wald, please meet Dr. Zegerian." Jerry shook hands with Omar Zegerian, who had the face of a zealot and burning eyes that not even years in space had dimmed.

"Dr. Wald, Mr. Procis." Hitchens chuckled heartily. "He's only an M. A. I'm only a B. A."

"We shall be happy to see you again, sir." Once a general, Procis retained the formal mode of address. His sunken eyes in a high forehead gave a quick inspection. His pointed ears seemed to twitch a fraction. "We thought our old friend would never desert us." He inclined his head at Darin. "We always look forward to his visits."

"Dr. Wald will be acting chief this time," Darin said. "For two years you have produced nothing. He will try to appreciate your latest sensation."

"Unfortunately, we have little to show. Report negative, much as it hurts us to say this. Earth is spending its money on us in vain." Hitchens seemed the epitome of dismay.

"Not even an artificial element?" Darin asked dryly.

ALL PRESENT knew from experience and reading—young Wald mostly from reading—that PCM1 had made other discoveries and inventions. One year it reported an artificial element that, combined with iron, could withstand pressures equal to those at the core of Earth. On the next trip they had revealed a new fuel for a thrust motor. On the following inspection they offered a tranquilizer, vinoalin, that enabled pilots to live amicably with their crews for months on end, without loss of mental keenness. Then for two years nothing. Now again nothing.

All the previous formulations had drawn one step higher toward a vague goal expressed in technological randoms, though the cost of maintaining the satellite, where men of genius but peculiar ideas of morality could work, was beyond the immediate returns. Of course, the inhabitants of PCM1 were not expected to evolve anything toward social unity or psychic ease Their mentalities were aggressive and often so violent in their expression that the ordinary rules did not hold for them.

NOW, FACING, a third bleak visit, Darin had to draw the proper inferences. After Jerry Wald got through, the older men had to make recommendations to a variety of Earth bureaus and justify the existence of PCM1, which had cost a billion and which he had persuaded a subcommittee of the Earth Council to have built.

"Well, we are working with some new gases," Zegerian answered. "The welcome sign is an abortive step to find something practical." He was the head of theory.

"Is it true, sir," Procis began, erect as a ramrod, "that Earth uses our Element 237 for the hulls of the new spaceships?" He was the power behind the talk, the head of procurement, manufacture, and assembly.

"There are experiments,"

Darin admitted, wondering whether Procis angled for information of peculiar benefit to himself. "I brought along some new journals reporting tryouts of small models in Osaki and Denver. I'll leave the tapes in the reception room."

"Yes, sir." Procis almost saluted. Like all of the triumvirate, he looked military in a suit of metallic gray, but with no frills such as a collar or lapels.

"I know your time is short. Shall we proceed with the tour, gentlemen?" Hitchens took the leading role and conducted the voyagers around the various levels. Giant lathes rotated silvery tubes, allegedly to make a new exhaust system for the globe. Screw machines attended by greasy figures added threads to rods. Jigs and clamps rolled off an assembly line, ostensibly for holding together new tanks of reprocessed water essential to manufacture.

IN THE center level, the nominal head man took them behind a leadium wall and explained that his men had been working on a new rocket motor, for which they had small hope. As they looked into tiny portholes he threw a switch. The metal tube began to roar, turned red, then white, and began to scorch the ceiling. In a few seconds it blew to pieces and shriveled into a formless mass.

"I was afraid of this," Procis muttered.

"Very unfortunate," Hitchens said.

"Quite a coincidence," Darin observed. Through his aperture, he watched the salvage robot enter the deluge from the automatic foamers and scrape the mess into a disposal chute, which led to the smelting plant below.

On the bottom level, above the curve that held the quarters of the common technicians, Darin watched the cybernetics postulators. One electronic set, a robodrafter, experimented independently on variations of four-dimensional planes. The machine had been going since last year, following a brainstorm of Zegerian's. It was a blind ape trying to create a formulation on bases known to no ordinary scientist, with methods and goals yet to be predicted. Fascinated, Wald watched the scanner at the end of the roller. Every second this super eye crossed a plan with an X and dropped it into a waste box.

Darin studied the reactions of his younger assistant and observed the actions of his crew. Every tool they inspected had microscopic marks on it and suggested something of the nature of the users, the level of their skill, and the nature of the tools that had gone before. The finished

products, valuable on the marketplace or not, might be guideposts to the future. By a process of extrapolation a skilled man could learn more in hours than Cro-Magnon had been able to invent in millenia. Here on the globe, where every survivor was an expert in at least one specialty, a whole lode of inventions might be discovered yet.

"You want to put the old brain machine on us?" Hitchens asked.

"I understand that a spot check revealed nothing last year," Jerry said. "Why waste time?"

SILENTLY, Darin approved. Whether the inhabitants of PCM1 had nothing to reveal, or had found a way to beat the detector, the urging had been a bit obvious. Probably they had used their tranquilizer last year, for all the subjects had been sluggish in their responses. A spot check would be a gamble. Running the entire group through would take days and more days to evaluate. An inspector, new or old, had to go on intuition, a kind of empathy, much of the time. One reason for young Wald's selection had been his high adaptibility quotient.

"You wish to inspect the living quarters, gentlemen?" Hitchens asked.

"No, thanks," Wald said.

"Our black gang at the power piles?"

"I'm sure their efficiency rating is excellent," Wald murmured and looked absently out of a porthole in the globe. "When we came in, we floated past that natural asteroid."

"That's Jake." Procis laughed. "We captured him a month ago. He's on a tractor-repeller beam, sir, exactly ten miles away." He seemed almost as unctuous as Hitchens. "Jake has some minerals we've been feeding our converter. Would you care to see it, sir?"

"Might be the find of the century," Jerry said without enthusiasm.

THE FIVE top officials ascended in a freight elevator to the highest level. After striding past the observatory, they entered Room 11. A squat object like a deep freeze with an outlet for ice cubes buzzed when Procis touched it.

Not to be outdone in importance, Hitchens picked up a shovel and threw two scoops of rock into it from a bin. When he pushed a stud on its side, the converter gurgled. In about a minute it emitted a brown sludge that smelled like soya cake.

"Try the mix?" Hitchens patted some onto a tin plate with a spatula and offered the dish to Wald.

"Well, now..."

"I'll try it," Helmut Darin said quietly. "Hm! Tastes like

kitepaste. Any nutritional value?"

"None whatever," Hitchens admitted. "Perhaps if we can drill deeper into Jake, we can extract some fossils." He pushed another stud. "Here's ice cream."

"Do you have the specifications for this thing?" Wald asked.

"Any time." Hitchens waved airily. "We can also produce treacle, goat's milk, and powdered pap. It just makes us sick."

"We'll take the converter along, just in case." Wald smiled. "Of course, it won't compete with real treacle."

"It's all yours." Hitchens gave forth with a hearty laugh. "Care to inspect the books?"

"I want to have the detectors run over your walls as we do." The acting chief inspector strode to a phone and called his next in command. "Get the counters out." This was Operation Shakedown, a search for hidden minerals or power.

BACK IN the reception room, Hitchens opened a drawer in a cabinet. "Here are the books, gentlemen—log, inventory, man-hours, stock control—but no profits. I have a square of film for every page. If you wish to take a random check, I'll set up the bellopticon."

"That's unnecessary," Darin said. He disliked taking over from Wald without notice, but there was no use in prolonging the formalities. The previous two years had discovered no flaws in the exterior presentation of this Nietzschean little globe. Everybody and everything would be as circumspect as a papal ambassador. "I'll look at a few sheets of your original records."

"Hm-m!" Hitchens cleared his throat, watching Darin turn to a ledger labeled *"Productions Hours."* "The summary is on page 234, sir. Unfortunately, our final tabulation is no credit to us."

He flipped to page 234. "Man-hours lost, 221,352. Dr. Darin, we are not always so neat as we are today. Sickness. Lack of women to prod us. No apparent incentive—just to live. Now and then the whole station almost closes because of space sickness. Then, of course," he added brightly, "men without women get careless in their habits. Do you know, that before Jake came along to titilate us, I had to order a cleanup campaign? Some of the mechanical roughnecks objected, and I had to subdue a riot. Luckily, only two died."

"How many in all died this last year?" For the first time, Jerry Wald seemed nonplussed at the problems.

"Only seventeen—not bad considering. Fights accounted for three. Two died in the riot; the rest from natural causes. But of course you know the truth." Hitchens

nodded unctuously. "This is not a colony for little boys."

DARIN NOTED that the mortality statistics almost doubled those of the previous year but said nothing. Some of the deaths "from natural causes" might have been arranged to get rid of dissenters.

"In three hours, gentlemen, we shall have our annual dinner." Hitchens checked his wristwatch. "I hope that you and your crew will attend as usual. Jerry, you and Dr. Darin will sit at my right. Your technicians will have the bottom of the first table. Our tanks have produced some delicacies I should hate to have you gentlemen miss."

"My sister sent me all quarters of a steer last month, sirs." Procis, not to be outdone, let his bald head glow. "Steaks, tonight."

"Good." Darin bowed politely. He knew what the triumvirate knew. He would need the hours to check with the technicians; hear their reports, which would probably be negative; and write the official entries in his own log. The converter, of course, would have to be loaded on the *Gremlin*. After the usual toasts and evasions, the inspecting team would go back to Earth. For another year PCM1 would seethe with its competition and class conflicts, but something beneficial to others might come from their efforts.

Political influence extended its tendrils even into space, out near the orbit of Jupiter. Like Procis, Hitchens could evoke names of influential families on Earth. Zegerian had had, at least once, an effect on millions, and probably a residue remained. Procis could get his steer and Zegerian his letters of congratulation by special messenger service after a government cutter inspected the cargo.

AT DINNER, in the commons on the second level, protocol ruled. Everyone was polite to his neighbor, and laughter rolled around the oblong tables. The Earth inspection crew, which had checked and found nothing suspicious, were introduced to all of PCM1 but the ready watch on the black gang. Procis made a stilted speech of welcome. Hitchens led the assemblage in old songs like "We Are All Men Together."

It was a routine party till Helmut Darin dropped a porcelain cup. "Beg pardon," he intoned and stooped. He felt it under his foot, but it was snatched away and kicked around before Hitchens appeared with it triumphantly.

"Here you are, doctor." He slid it to Darin, who thoughtfully felt the glaze.

"Very interesting," Darin laughed uneasily. "I guess the old fingers are getting unstable. Time I retired."

"Forget it, sir." Procis shook his head in sympathy.

"Keep it as a souvenir of your visit."

"Well, thank you. I'll put it on the mantle alongside my Venusian turbot." Darin slid the mug into a side pocket. "As retiring inspector, I give a toast. May this community prosper—as far as it should. Skoal!"

The heads drank ersatz champagne at the first table, and the underlings drank ersatz beer at the second.

"Now, if you will forgive me, I must return to the *Gremlin*. I forgot the seal to affix to your books as evidence of my visit. Palsy, I guess."

AT MIDNIGHT, he returned and duly exercised his stamp and seal. A few minutes later the Earth inspection team blasted off in the *Gremlin*.

After the pilot eased up on the acceleration, Jerry Wald unstrapped himself in the executive's cubbyhole and yawned. "I don't see what's hard about this chore. The worst is the trip."

Darin pulled himself out of his basket and tried to find the floor with his magnetic soles. "This is your first postgraduate course. From now on, you'll have to adapt and extrapolate a notch higher."

"How much did I miss?"

"You haven't been around here as often as I have. You'll learn; and maybe I can stand one more course of gut-stretching to help teach you. I can't endure acceleration the way I could."

"I thought that was a ho-humdrum, a boring job." Wald settled to the floor and looked at the stars moving past so slowly he had to use his training to realize their speed.

"Not quite." Darin thudded to the desk they shared for this flight. "In fact, things might pop so hard we may be written up in the journals. I know you were on guard against the triumvirate, and the human apes they have subjugated in their political system. It was inevitable that the organizers and word-mongers get control, but you should have been more alert to their potentialities. That wasn't an ordinary cargo of connivers you saw."

"I READ all I could get," Wald answered slowly. "Hitchens was a publicist and union agent who looted the treasury of Consolidated Tradesmen for a billion or two. He put all his relatives on the pension fund, even to fourth cousins, and got a fifty per cent kickback."

"Good enough summary."

"Zegerian tried to save Earth from its inner ills, not knowing that even at the optimum it would take seventy generations merely to breed out ninety percent of the misfits, even if anybody had the power to enforce such a law of casting out. As a physicist, he invented a new capsule

power pack and failed to notify the government. He smuggled it out by the gross by throwing it in the scrap, which Pasco then sold to his relatives. In physics he was—probably is—a genius; but in other respects, almost a moron. His friends and kin sold perhaps a thousand miniature power stations for money to help the downtrodden. In his case, that meant the split personalities confined in various retreats on the planets and minor fragments. He wanted to liberate all the psychopaths as victims of society and almost did. His fantasy of turning them into lucid minds by education, and then breeding out all insanity—to use the old term—never came true and could not in our present stage."

"GO ON. I have to check my rating sheet on you." Darin sighed. "Zegerian's One Mind Movement. He thought that saying good, his good, would cure everything. Moral talks and amateur biology would do it all. Since he's been out in space, he's apparently learned nothing outside his two lines, physics and reform. I doubt if he knows that at least three of his customers smuggled his capsule off Earth and tried to sell it to aliens. Hitchens once gave me a hint 'that the man is impractical'—meaning that the other two of the triumvirate have protected him from the skull crackers and keep him on only because of his possible aid to the Nietzschean state."

"I'm bright, but not overly informed." Wald sighed at his inexperience. "Procis made a fortune selling illicit goods to civilians from military stores. He had the temerity to use Army Ordnance conveyors to express the stuff to a drop in the name of his commanding general. Unluckily, the seven-star boss came home a week early from a vacation to Mars. Thus endeth the chain of surplus Army goods."

They both knew that PCM1 held a variety of talent. Chemists, holdup-men, muggers, metallurgists, and psychopathic compulsives mingled. When Earth had abolished capital punishment, even for treason, a paternalistic administration had agreed to PCM1 in theory and six years later assembled it in fact. Rather than waste the talent of some of the more notorious criminals, a new section of the punitive code had allowed all volunteers, final selection to be made by a board headed by Helmut Darin, to go into space on Penal Colony Model 1.

A BOARD of psychiatrists had predicted, on the basis of the selection, that a strong central government would arise on the satellite, with caste distinctions and customs that would soon become iron laws. Unfortunate-

ly, as in the old slave days of Babylon, the masses had to do the dirty work. A few would arise by guile and treachery to lead the strong-arm men, some of whom had been machinists and technicians during a period of automation that bored all the workers.

Darin felt a twinge at the development of the pecking order. Three men reported dead by the satellite's books—including the astronomer—probably had been exterminated in the struggle for power. Uncounted forgers and draftsmen had been throttled or beaten to death during emotional spasms. There were enough sadists and masochists to satisfy their various expectations, even unto death. Some knuckled under gladly because they needed direction; others emerged, with iron fists or sauve talk, to the forefront of a pathetic little world. The personnel of PCM1, sick as those Zegerian would rescue, made democracy impossible.

"The convicts are not guarded. They have access to modern theory and reproductions of selected scientific journals. Their purpose is to escape. Earth's is to use them as experimeters." Wald looked serious.

"Your memory is nearly perfect," Darin commented. "As you suggest, getting away from Earth's jurisdiction is the primary motive. Now a little imagination and projection."

"THEY MUST plan to scoot off, even if they die for it." Wald reflected aloud. "The other alternative—that they should be content to escape the Luna mines—seems untenable. Besides their natural desire to be clever, everything has been done to encourage them. They have no guards, no numbers on their backs. To them gratitude for their lives is impossible. In their warped minds they must have a feeling of status they can get only by self-approval. Therefore, they have to strive for a new world and exploit it to demonstrate their own importance."

"But you don't see how?"

"I imagine avenues of possibility, but our inspection suggests nothing they can do."

"This is your first trip. However, last year PCM1 had tin plates for the banquet."

"They get bored. They made the vanishing welcome sign out of ennui, I suppose. They want a change."

"They want a change, all right, but they're not ready to move yet," Darin said.

"I don't understand why you're so suspicious, chief."

"We had china plates this year. Cups, saucers, gravy boats—all of hard porcelain."

"I never took up ceramics." Jerry shook his head.

"The problem is simpler

than a knowledge of all the crockery ever made."

"I know they exhibit signs of escaping. I've seen their machinery, and my opinion is they can't do it. They're aimless. The blues have them all, as the schedule of man-hours lost shows. The converter is a toy, like the welcome sign. They're at loose ends." Jerry debated within himself.

"THEY MIGHT, but they can't. Is that your final opinion?"

"Nothing is finale except my flunking this oral quiz." Wald gestured wryly.

"You've passed a l r e a d y. You know more than I did at your stage," Darin said.

"A dwarf may see farther than a giant by sitting on his shoulders."

"Thank you. H o w e v e r, when that globe felt like justifying its existence, the boys came up with a high pressure digger, fabricated from a new alloy that could withstand a thousand tons of pressure per square inch. They stalled for a year, then came up with the Joker, something that could blow methane smoke rings, catch the gas in a fan, and convert it into oxygen."

"That's impossible."

"They did it—a gag like the welcome sign."

"Toys. Diversions. You may instruct me, sir," Wald said, "but I fail to see how so few hundreds of men can do a systematic research in any field that might allow them to escape."

"You're a high normal, I. Q. only 140. At the age of 42, Hitchens hit the buttons for 190. Zegerian laughed at the math and general information tests, and walked off with 210 in a few minutes. I tested them as I tested you. Of course, both had social quotients of less than fifty." Darin fixed his mouth in reassuring lines. "You were selected not because of an erratic monoline of genius but because of stability and a high adaptibility."

"The escape velocity from PCM1 is almost nil," Wald said. "They might make it to the red spot on Jupiter. It's the nearest planet without an Earth colony to check on them, and the astronomers seem to think there's life of some kind there. But any arrivers would need mighty protection to withstand the triple gravity and temperatures that begin at minus 140 C."

"REMEMBER that earthworm digger that can w i t h s t a n d those umpteen pressures; their little converter that might convert; and their Joker? Don't forget Jake as a possible source of raw materials."

"Everything is unfinished. Of course, Earth technicians have elaborated on their designs, and a few corporations have made money on them with government subsidies."

Wald disagreed. "Their return to one of the cruder arts, porcelain, indicates a kind of cultural regression."

"P r o g r e s s i o n." Darin sighed. "When I found out the high rate of absenteeism—due to spots on Venus, lack of sex, and so forth—I merely registered the fact, which I suspect is a non-fact. When I stepped on the porcelain cup, it wouldn't break. I stamped on it. It skidded away. While you held the fort and listened to more toasts I went back to the *Gremlin* and had it tested."

"I observed your putting the official seal in your pocket before we landed."

"I'm glad you knew I didn't have to go back. I sponsored this project, but I'm not a social worker who thinks mostly in terms of compliance, and overlooks danger for the privilege of giving the bad boys another chance." His energy regained, Darin looked hopeful. "I think the satellite will pay off at last."

"You had the cup tested."

"Up and down and inside and out. It did not allow any ray we have aboard to penetrate. It would not break. It withstood half a million degrees. Anything that could baffle our gadgets must be special."

"I understand the lesson, sir." Wald snapped his fingers. "Their egos are so bloated they think they can delude us."

"Three years in a row they have produced nothing but apparent toys. Heavy absenteeism. Spacesickness. Assorted excuses." Darin led his junior toward inferences.

"HOW'S THIS for an idea? They have a new synthetic they can use for rocket tubes, probably this porcelain. If they have a power source, they can take off. Their gadgets might be something after all. Do you think their Joker can convert methane into oxygen?"

"Earth scientists went over their pilot model with every tool at their command but could never duplicate the process," Darin said. "Or the results. I won't argue whether the smoke rings they showed us in pinks and purples consisted mostly of methane, but that joke was on us. Just yesterday, their burning up the rocket motor was another, and a hint. That's the end of their various gags, as far as I'm concerned."

"Now I'm on the right trail." The excitement shone in Wald's eyes. They'll try to swish off before the next regular visitation. If they could have gotten away before we came, they'd be gone now. They must be close."

"In this game one has to ride by the feel of his pants sometimes." Darin opened a drawer for a blank form and printed a spacegram. "Right now, I feel the reason why

your monitors couldn't find any hidden machinery or power sources is that this alleged porcelain shielded them."

"I think I know a bit about physics, but the idea that so much heat could be contained by a crockery shield never occurred to me," Wald admitted. "Some of the funsters may have established a new science. Think they'll try to push their globe along or break it up into smaller units so some will escape any patrols? My guess is they'll stick together."

"Good guess. But no matter what they do, they'll have more problems than any human group has yet faced. To protect them, and Earth, I'm calling in a freighter to tow them to Luna base. There the technical eagles will give them a real going over." Darin signed his code number to the dispatch and handed it to Jerry. "Go forward and put this into the transmitter. Wait for an answer."

THE CHIEF INSPECTOR let his head droop on his desk. He had no misgivings, though he would have preferred to send the message himself. It was a command in request form and his was the sole responsibility. Yet, the youngster had to learn. He wondered what lay on Jupiter's red spot, perhaps a desert 20,000 miles long. Lichens? Trees that lived mostly underground? A hobgoblin race of humanoids? He wondered if the orbit he had suggested for PCM1—halfway between Venus and Earth—was the best to stimulate productivity among the nonconformists. He chuckled at the thought that all were bound together in an iron state. He dozed for a while.

Jerry Wald stomped in as rapidly as he could. "I got Luna HQ on the second try. They're sending the *Titan* for the job."

"I supposed so." Darin seemed indifferent. His task was accomplished. The thought behind the cryptic message had been chosen hours ago. He had to jolt himself to attention when Wald asked his last question.

"Why did the schemers on PCM1 have to advertise their powers with the new china? I suspect the answer, but I don't know the personnel the way you do."

"They're all egotists. Some of them, especially the top drawer bureaucrats of that Nietzschean community, were well off. No wolf at the door threatened any of them, not even the technicians turned bandit. Hitchens, Procis, Zegerian—all had more money than they could ever use. Yet each reached out for power as a totem of his cleverness. Now in their new little world they acted according to pattern. This time they thought up a new joker, a clue so obvious it would be missed.

Procis kicked that cup from under my feet before he indulged his final effrontery and gave it to me. Their isolation has made them lose what perspective they had. If we had an audioscope peering into their quarters now, we'd find them laughing at us. Want to bet?"

"No bet, chief."

Darin went back to his harness and strapped himself into his seat.

The *Gremlin* floated silently toward Earth.

★ The Reckoning ★

It was a close race for the three top positions this time, and oddly enough, the story with the most first place votes didn't come out first, after all. Here they are:

1.	A Bird In The Hand (Gordon)	2.50
2.	Wheels (Zuroy)	2.63
3.	Haunted Centennial (West)	2.66
4.	Silly Asses (Asimov)	3.15
5.	Squee (St. Clair)	4.33
6.	Idol's Eye (Emshwiller)	4.53

A YARDSTICK FOR SCIENCE FICTION

Special Feature

by damon knight

The top science fiction critic in the field discusses standards for science fiction. What makes for good or bad in this specialized field?

A FEW YEARS ago, in my first review column for *Science Fiction Adventures*, I wrote: "that science fiction is a field of literature worth taking seriously, and that ordinary critical standards can be meaningfully applied to it."

That word "literature" I'll come back to in a while. The rest of it I still go along with; but lately it's been occurring to me, every now and then, that we need a reliable set of special critical standards, too.

Science fiction, after all, has its own special problems, just as the detective novel does. There are good things you can do in science fiction that aren't possible in any other field; and there are mistakes you can make that would never happen anywhere else.

As I remarked at the recent Philadelphia Science Fiction Conference, we can expect a little difficulty in standardizing a field that includes *"1984"*, *"Perelandra"*, *"Zotz!"* and *"The Incredible Shrinking Man"*. However we brush aside these minor difficulties for the present. What we want to know is simply this: "What is science fiction all about, anyhow?"

WELL, TO begin with, science fiction is entertainment. Right? Therefore if it entertains us, it's okay; if it doesn't, it isn't. I don't

know. I've been enormously entertained by some of the foulest science fiction ever written. I also find a lot of things entertaining that are not science fiction: people, dogs, senate committees, comic strips...

Evidently this principle needs refining. I suppose, in passing, we ought to mention the old theory that science fiction is written by scientists, to educate the readers. People sometimes complain that this isn't true any more, but I think you will find that it never was true.

When I was eleven—that was in 1933—I read a story that still sticks in my mind; it was one of the first science fiction stories I ever read, and it gave me a fascinating vision of a space station as a place where gravity was magically suspended, and you could float in air.

The story was cleverly worked out: it was about this fellow who was kidnapped and held prisoner in the space station; they got him up there drugged, and they had him dressed in a magnetic outfit, so that it wasn't until he got the thing off that he knew he was in space. There were magnetic particles in the mush they fed him, too; they had it all worked out.

Well, I swallowed all that —I was eleven at the time. And I liked the story so much that just recently I dug through my old magazines until I found it. It was "The Space Coffin," by A. Rowley Hilliard, in *Wonder Stories* for August 1932. When I read it again, I found something I had forgotten about the story.

This space station was in an orbit outside the atmosphere; and when the kidnappers wanted to return to Earth, they lowered themselves on a cable.

That was in the period when Gernsback ran a list of twenty distinguished scientists and educators on the masthead; they were supposed to pass on the scientific accuracy of all stories.

RECENTLY, I picked up the current issue of infinity—a magazine in which I take a friendly interest—and read the first couple of pages of a story by Richard Wilson, a guy I like. As the story opens, there's this big hole in the ground where a city used to be. So they suspect radioactivity (naturally) and they send for a someone with a Geiger counter. But the Geiger doesn't click. Let me quote what the author says: "...but no matter how he shook it and rapped on it, it refused to click."

I put the magazine down. Later on, I picked it up again, and finished the first instalment of the story, and liked it.

But Mr. Hilliard wasn't teaching me anything useful about the laws of motion

when he sent those men down on a cable; and if I had hoped to learn anything about Geiger counters from Dick Wilson, I would have been disappointed.

Let's confidentially admit that science fiction stories are written for various motives, some good, some middling—to have fun, to make a philosophic point, or to pay the rent. Hardly anybody is writing science fiction to inform anybody about science; and hardly anybody writing science fiction is capable of informing anybody about science.

There are other places to get information if you want it. When Bradbury comes along and writes about Mars as if it had a breathable atmosphere, or when Alfred Bester tells us that "tin crumbles to dust in the absolute zero of space," we are suckers if we take that as fact. Both Bradbury and Bester are writers of fantasy; they use the gadgets and backgrounds of science fiction, but for their own purposes.

So we come back to entertainment again, but it still isn't enough. If we apply that standard all the way down the line, then we have to tolerate any ignorant error made by the poorest writer who happens to stumble into science fiction.

THERE HAS to be a place to draw the line. Let's try it this way: If the scientific error, or lapse in logic, serves a purpose—if it's an *essential* part of the story, like the breathable air on Bradbury's Mars—*and* if what comes out the other end is art—okay. If it's an unnecessary error—pure wilful ingorance or carelessness—nix.

Mr. Hilliard could just as well have sent those kidnappers down by rocket, and Dick Wilson could have let his Geiger click; the stories would not have been any the worse.

I am using these two writers as scapegoats; I could just as well have picked on any of thirty others. Errors just as blatant and unnecessary turn up every month in the magazines; and the books I review, if anything, are worse.

Now I said I'd come back to the word "literature," which is rather an embarrassing word. A couple of years ago, when the last bosom-appeal science fiction magazine died, we had a wave of talk about how science fiction was growing up, and was the literature of the future—that word again—and so on.

There have always been people in this field trying to do a little more than spin an entertaining tale; but for some reason, along about 1950, this became more noticeable. Ted Sturgeon advanced the interesting theory that the competition of the real scientists was driving science

fiction writers out of the fields where exact knowledge was required, into "sociological, psychological, and comparative-ecological stories." He thought that this resulted in higher quality because those kinds of stories demand more original thinking. Well, perhaps so.

But we still have a good bit of space opera left, five years later, and it seems to me more to the point to ask, What exactly is it that these "matured" writers are trying to do in science fiction? Or, to repeat: what is this kind of science fiction all about, anyhow?

THIS GETS us into the even more bewildering question, What is art all about, anyhow? I assure you —I have no desire to get tangled up in that one.

But here's a concrete example, always a useful thing in a rarified discussion like this: "The Long Tomorrow," by Leigh Brackett. Now. this is a book that I read with great pleasure. If it's maturity that you're looking for, or depth, or "literary quality," this book has it. Unfortunately, the good part is not science fiction, and the science fiction part is not good.

Miss Brackett was having a whale of a good time in her backwoods society, writing about the adventures of two country kids growing up. The story is supposed to take place after an atomic war; but with very few changes, it could have been laid in America a hundred years or so ago. The legendary "Bartorstown," where 20th-century science is still alive, serves through most of the book only as a symbol of something wonderful and unattainable: it's like the will-o'-the-wisp, or the end of the rainbow.

When Miss Brackett lets her hero *find* Bartorstown, the story abruptly becomes science fiction, and just as abruptly loses every other virtue. The effect is startling; it's like two different stories—indeed, like the work of two different authors.

HERE'S another example, a story by Algis Budrys called "The Skirmisher." And again, what is good about the story is the vividness with which it's written: you see that guy lying on the ground with his rifle; you see the purple bruise on his shoulder, and later on you can feel those empty cartridge cases slide on the grass. This is a bit of very good writing; but the science fiction gimmick behind it is pushed out of sight; one more inch and it would not be important to the story at all.

We have been well warned against Westerns masquerading as science fiction, ever since Horace Gold's famous back-cover editorial on the first issue of *Galaxy*. But I have a feeling we are being

sneaked up on by little-magazine stories masquerading as science fiction.

This kind of thing *seems* to bear out Arthur Koestler's contention that science fiction can never be literature: because literature must be a work of disciplined imagination, and fantasy is unlimited. If he's right, it's the very freedom we boast about that's our undoing.

Something very similar does appear to happen in the formal detective (murder mystery) story: the technical requirement to keep the villain unidentified until the end interferes with the literary demand for all the development of character you can get. So you have a purist like John Dickson Carr, whose plots are brilliant and flawless, but whose characters are not worth a damn; and you get a maverick like Rex Stout, whose plots are nothing much, but whose principal characters reach out and grab you by the necktie.

In spite of all this, the detective (murder mystery) novel is pretty healthy; and you find a lot of mixed solutions, a lot of surprises and a lot of good writing. Is it literature? No, I guess not—not very often. But *can* it be literature? —That word again. I don't see why not.

At any rate, I think it's important to realize that some of the people who do the hard work in this field are doing their damnedest to turn out something that will last. (If you want my definition of "literature," those last four words are it.) Whether any given sample *is* actually literature or not, we don't know, any more than we know whether it's prophecy. Wait and see—preferably about a hundred years.

I GOT A letter a few weeks ago, forwarded by Tony Boucher, from a talented writer who read my story "A For Anything," and thought it was meant as an allegory on the subject of automation. His letter was very lively and intelligent (and he has since written an excellent short story for the purpose of disagreeing with me), but his primary assumption made my hair stand on end.

This is what I would like to write in letters of fire on that man's forehead: *A story is a thing in itself.* You may start out with something like allegory in mind, but either the thing never comes to life at all, or else it grows into something you can't define in any but its own terms. A story that is *only* allegory is bad allegory.

People who look at a painting and see nothing but the scene the artist drew, see nothing at all. A painting is a painting, not a scene (though it may include a scene); a story is a story, not an argument (though it may include an argument).

Now it happens that the

science fiction spine of a story generally takes the form of an argument. If such and such happened, then this would come about; and then this; and you wind up over here.

That's essential. If you do not have it, or if it's poorly done, then the story may be good in other respects, but it isn't good science fiction.

What I am a little worried about is that we may fall into two opposing camps, the purists and the bohemians—say with Hal Clement at one end, and Robert Sheckley at the other. If we actually believed that the two things are not compatible—or that only one of them is important—then I think we never would write anything that would be worth reading a generation from now.

TIME FOR another example: a favorite of mine, "Sugar In the Air," by E. C. Large. This book was published in England in 1937; the science fiction part of it is about a process to manufacture sugar out of carbon dioxide and water: something that was actually done experimentally a few years ago. The human part of it is about the young engineer who falls in love with the idea of sugar from the air, and who struggles against the inertia of stupidity and c u p i d i t y to make it come true. Incidentally, he fails.

I think that, except for some pretty stiff passages of political propaganda, it's a lovely job of writing. The science fiction part of it is not something you can pull out of the book like a skeleton out of a fish. If you took it out, the human part of the book would lose its meaning. The people revolve around the science fiction core.

The ideal is a story in which the science is treated with the same loving skill as the human relations. It takes a certain wideness of vision to bring them both together, and that's probably what makes it so rare: most of us find we have to concentrate on one thing or the other.

But at least we know it can be done. Heinlein does it, for one; Large did it, and Wells, and a good many others.

THIS YEAR, once more, we got our ears batted back by *Time Magazine*. The Science department of the magazine is up to here in the stuff we have been writing about these last thirty years; but in the book review section, science fiction is still drivel for morons.

What hurts is that they're partly right.

Potentially, I think science fiction is in great shape: something we write in this decade may wind up, God forbid, in the schoolbooks twenty years from now. But at the present moment, I don't think we're doing so well. All but a handful of the stories I've

read in the magazines this year have been discouragingly bad. I would not push this too far, but I think part of the blame may lie with the two most influential editors in the field—Campbell and Gold—one of whom is dedicated to the proposition that only the science matters, and the other to the proposition that it doesn't matter at all. The high word-rates are going for stories which are essentially half-finished. When someone like Walt Miller or Phil Farmer does succeed in packing both the science and the human qualities into one story, Tony Boucher gets it for half of the Campbell or Gold top rates. This is a shame, and it may account very largely for the fact that there's so little writing of that caliber. Not many people can afford to do that much hard work for such pay.

As for the hard-cover book market, we are traditionally orphans there, and as far as I can see that hasn't changed much yet. An occasional exceptionally good science fiction novel gets published in book form, along with a mass of outrageous tripe. *The Saturday Evening Post*, which used to have a firm policy of buying fantasy only from Stephen Vincent Benet, now buys a science fiction story now and then—usually from an Englishman: but don't hold your breath until science fiction stories outnumber the westerns in the *Post*.

Sputniks I and II may have been temporarily good for our business; but people who turn to science fiction as a novelty will drop it, just as they tire of any other novelty. Let's not kid ourselves that the headlines about ICBMs will do our work for us. The only way to make science fiction better is to demand more of ourselves, as readers and writers; and to hope that eventually good editing will drive out bad.

Just Call Me Irish

by Richard Wilson

The owner of the house was a veteran, a student, and ... yes, he could prove that he fulfilled all the requirements for residency in this development. Nonetheless, our salesman seems to have become somewhat confused...

THE HOUSING development near the university was newly finished. Salesman John F. ("Call Me Happy") Horman had waited a week for the tenants to become settled before making the rounds with his sample electric rat trap and his order book. He began at the southwest corner of the project and knocked at the first door.

As it opened Happy went into his spiel. Toward the end of his second sentence, he skidded to a stop in the middle of a syllable when he realized he was talking to a dog. A female dog.

Happy was confused. "Is your master in?" he asked.

"Just a minute," said the dog.

The door closed and Happy stared hard at it. Then it opened again. A larger dog stood there.

"What can I do for you?" asked the larger dog.

"This is ridiculous," said Happy. "When I asked that other dog if her master was in, I meant the master of the house, not *her* master." He consulted the list of names of the families who lived in the project. "I was looking for a Mr. Setler."

"Setter's the name," said the dog. "They misspelled it. I'm the master of the house. Is there something I can do for you?"

"I don't know." Happy Horman took off his glasses,

wiped them, replaced them on his nose, blew his nose, replaced his handkerchief and looked at the large reddish animal in the doorway. "This is very strange. Are you a talking dog?"

"Obviously." The dog swatted a fly with his tail. "Are you a talking man?"

"Why—yes."

"THEN why don't you say something? Are you with the housing project? Because if you are, I wish you'd do something about the sink. It leaks. And my son Whiffet is getting tired lapping up after it. Besides I think it's undignified."

"Mr—ah—Setter," said Happy, mustering his faculties, "I represent the Ohm Electric Rat Trap Company. Our slogan is 'No 'ome should be without one.' " He laughed emptily. "I think you'd be interested in a little demonstration I'd like to make for you. That is, I *think* you'd . . ."

The door opened wider, and the dog who had first spoken to Happy appeared. "Irish, dear," she said, "will you please come in or go out? The kennel's getting cold."

"House, Maureen, not kennel."

"House, then. But why not ask the gentleman in?"

"Yes, won't you come in, sir? said Irish. "If you don't mind the place being somewhat littered."

Happy went in and sat on the edge of a normal wooden chair. He looked around with interest but so far as he could see the furnishings were those of an average dwelling. It did not look at all like a doghouse, though it unquestionably was a *dog's* house.

IRISH CURLED himself comfortably on a couch while Maureen excused herself, saying it was time the younger whelps were fed. "I'll be glad when they're weaned," she said. Happy Horman blushed.

"Mr Setter," Happy said, "please forgive me if I seem curious, but just how—that is, why, uh—how come you're living here?"

"Why not?" Irish said. "I'm eligible."

"But I thought these houses were set aside for veterans?"

"I'm a veteran," the dog said. "Want to see my honorable discharge from the K-9 Corps?"

"Oh. But you have to be a student, and you have to be married, I thought."

"I *am* married, Sir," Irish said in a hard voice. "You don't think I'm just living with the bitch, do you?"

Happy coughed in embarrassment.

"Please, Mr Setter, I meant to imply no such thing. But how can you be a student? At the university, that is? I realize that we're all students of

human nature, heh heh, you especially, of course, being a —a canine."

"Dog is good enough. No need to get hifalutin. Would you like to hear the whole story?"

"Why, yes, I would."

"It began about 1949," Irish said, settling himself more comfortably. "My master (before I became my own) was Professor Neil Wendt, the big nuclear physics man on campus. Or should I call him the nuclear physics homo sapiens?" he asked archly.

Happy laughed hollowly.

"I DON'T FULLY understand, even now, what exactly Wendt was doing but I was his constant companion, his dumb animal friend. Then one day, as I reconstruct it, I was affected by radiation and when Wendt called me I said 'Coming.' Just like that. I don't know who was more surprised, Wendt or me.

"After some preliminary confusion we sat down and talked the thing out. We found that we could be of considerable help to each other. I suggested a few improvements in his equipment, having had a dog's eye view of it from underneath; though actually it made little difference because in a few weeks the Atomic Energy Commission took the whole thing over. In the meantime he went with me to the dean and with a little coaching I was able to pass the examinations and was awarded a bachelor's degree. You a college man, Sir?"

"Er, no," Happy said.

"Um. Well, later, when I was working toward my master's, I realized there were most important things than books. I refer to the Korean War. So, as any red-blooded American dog would do, I enlisted. The K-9 Corps is a fine organization, in its limited way, and I was very quickly promoted to sergeant. But the caste system! Absolutely unfair. I had heard about openings in Officer Candidate School and inquired about them. My first sergeant laughed at me but by dogged persistence I got to see the regimental commander.

"He was sympathetic but had to refuse my application. Said there was nothing in the ARs about it. What a welter of dogma those army regulations are! So I was forced to finish out my army career as an enlisted dog. True, I finally made master sergeant—though they claimed it was stretching a point for a dog to become a master—but my hackles still rise when I think of the indignities I suffered under the myth of racial superiority. What a blow to one's pride to be forced to write 'animal' opposite the word race, when almost everyone else was able to write 'human.'"

IRISH GLARED so at Happy that the salesman winced.

"But that's all over now, Mr Setter," Happy said. "And now you're back at school. What field are you in?"

"Anthropology, of course," Irish said. "But we've talked enough about me. What was it you had to show me, Sir?"

"I really don't think you'd be interested," Happy said. "It's something *you* certainly would have no use for. You see, it's a rat catcher, and surely you of all ani—er, of all people, wouldn't—"

"Well, I don't know. I don't see why not. I suppose you might argue that I'm perfectly capable of catching rats myself. It's true that I'm still a young dog, but I don't have the time for sport that I used to. Suppose I take a look at your model."

Relieved to be in action again, the salesman rose and plugged in the cord of his electric rat rap. With a rubber rat he demonstrated its possibilities."

"Well, I'll be doggoned," Irish said. "Maureen, come in and look at this gadget."

The female dog (as Happy preferred to think of her) came in. She also marvelled at its efficiency. "Let's get one, Irish," she said. "It'll save us an awful lot of work."

"I think I will," Irish said. "If you'll make out an order for us, Sir? That's fine. Just put the pen in my teeth and I'll sign it. There."

HAPPY HANDED over the receipt, discreetly wiped the doggy saliva from his pen and prepared to go.

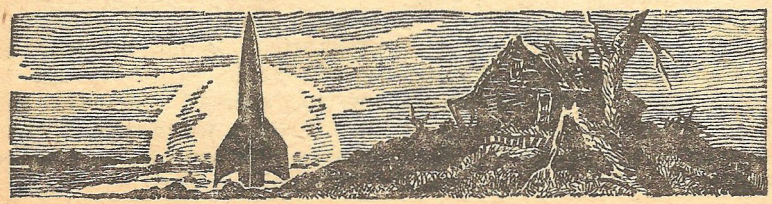
"Drop in any time," Irish said. "You might like to come in some evening and tear a bone with us."

Happy forced a chuckle. "You're quite a wag, Mr Setter," he said daringly, and was relieved when his customer broke into a barking laugh and closed the door after him.

Happy Horman took several deep breaths of air, then turned back to look at the house. No was was visible behind its windows. He looked at his order book. There was the bold signature: *I. Setter.* He shook his head, shrugged and went to the next house.

He knocked. A fat young man opened the door.

"I beg your pardon," Happy said, "but is your dog in?"



A Department For The Science-Fictionist

Inside Science Fiction

Reports and Reminescences

by Robert A. Madle

BACK IN 1932-33 a fan publication was issued by Jerome Siegel and Joe Schuster, two s-f enthusiasts of the period. The title of the magazine was simply, *Science Fiction,* and it was intended to supplement, in a small way, the three existing magazines of that time, *Wonder Stories, Amazing Stories,* and *Astounding Stories.* This magazine, published in an extremely limited edition, has turned out to be a particularly difficult item for completists to collect. Over the years we had managed to obtain the first two issues, while our good friend Sam Moskowitz ferreted out the last three. Finally, realizing the improbability of either of us completing our partial sets, a horse-trade ensued which resulted in Sam becoming the proud owner of one of the few complete files of *Science Fiction* known to exist.

Sam, bubbling over with grateful enthusiasm, offered to compose an article on the historical importance of *Science Fiction,* to be published in this department. Naturally, the offer was accepted and the article appears below. It is a distinct pleasure to present this guest article by the man about whom Anthony Boucher, editor of *Fantasy*

and Science Fiction, stated the following in his February, 1957 issue: "Sam Moskowitz is not only an enthusiast, a writer and a onetime editor of science fiction; he is the foremost historian of the field."

HOW "SUPERMAN" WAS BORN

by Sam Moskowitz

IN THE old days, before the atom bomb, extending a definition of science fiction to a layman would inevitably result in the exclamation: "Oh, you mean like Buck Rogers!" The popularity of Buck Rogers has dwindled with the passing of the years. Today, the character most synonymous with the term science fiction is probably "Superman."

It is singularly appropriate that these two famous cartoon characters should have become a symbol for science fiction in the minds of the public, for both of them, in a very real fashion, were an outgrowth of the science fiction magazines.

Philip Francis Nowlan, creator of Buck Rogers, first introduced his renowned character to the world as Anthony Rogers, in "Armageddon—2419 A.D.," published in the August, 1928 issue of *Amazing Stories.* This was followed by a sequel, "The Airlords of Han," in the March, 1929 issue of the same magazine. The story, characters and all, were transferred to daily and Sunday comic strips shortly thereafter.

Superman also grew out of the science fiction magazines, but in a somewhat oblique manner. The increase of numbers of science fiction magazines in 1929, when Hugo Gernsback left Experimenter Publications, under whose aegis he had published *Amazing Stories, Amazing Stories Annual,* and *Amazing Stories Quarterly,* stimulated interest in science fiction. Gernsback immediately formed the Stellar Publishing Company and, in quick succession, issued *Science Wonder Stories, Air Wonder Stories, Science Wonder Quarterly,* and *Scientific Detective Monthly.*

Something else was accomplished by Gernsback: giving the science fiction readers a specific consciousness of their uniqueness as a clique by sponsoring essay and letter contests on such subjects as "What Science Fiction Means to Me" and "What I Have Done to Advance Science Fiction." It was with announcement notices of the letter contest on "What Science Fiction Means to Me," mailed prior to the publication of the June, 1929 *Science Wonder Stories,* that Gernsback used the term "science fiction" for the first time in history.

A little over two years later, in October, 1932, two

youngsters in Cleveland, Ohio—Jerome Siegel and Joseph Schuster—issued a mimeographed publication of slightly over letter-size titled *Science Fiction.* This was the first time that the term "science fiction" had been used as the *title* of a publication. It lost out on the distinction of being the first publication ever to use the term *in* its title by the space of one month, being beaten by the first issue of the famous old fan magazine, *Science Fiction Digest,* which made its appearance in September, 1932. Six and one-half years would elapse before a professional publication would have the courage to call itself simply, *Science Fiction.* That distinction belongs to the magazine known today as *Science Fiction Stories,* whose first issue was dated March, 1939, and is why that publication terms itself, "The *Original* Science Fiction Stories."

Siegel and Schuster's little magazine was subtitled, "The Advance Guard of Civilization"; it contained no illustrations and carried stories by Eugene I. Frank, Carl Mann, Leon N. Franklin, and Herbert S. Fine, *all* believed to be pen names of its editor, Jerome Siegel.

Previously, Siegel had issued a typewritten science fiction magazine called *Cosmic Stories,* carrying features by Clare Winger Harris, Walter Dennis, and Bernard Kenton, the last a pen name of the publisher. He had also mimeographed a pamphlet, "Guest of the Earth," by Hugh Langley, also his pen name.

The second issue of *Science Fiction,* which was accidentally numbered Volume 1, Number 1, but which can be identified by the fact that it is dated November, 1932, carries a cover, illustrations and department headings by artist Joseph Schuster. They were quite good, considering that they had been drawn with a stylus on a stencil. The third issue found illustrations by Schuster that were definitely up to professional cartoon standards, even considering the mimeographed medium.

An item of historic interest in "Science Fiction News," a department in the third issue, was a letter from Harry Bates, then editor of *Astounding Stories.* He wrote, quite facetiously: "I received this morning a copy of the second issue of your new magazine, *Science Fiction,* and went to thank you for your kindness in remembering me. Your stories look much better than I would have thought possible under the circumstances—and my congratulations go to you.

"Please do not make your new magazine too good, however, for it would be unpleasant for me to join the ranks of the unemployed!

Sincerely yours, Harry Bates, Editor, *Astounding Stories.*"

Immediately beneath the letter was a classic "PS": "Well, it's just happened. I've just been instructed to discontinue *Astounding Stories* with the January issue. Good luck to you in *your* venture!"

The fourth issue of *Science Fiction* featured the first installment of a two-part story by Raymond A. Palmer, "Dimension Drug," one of the earlier pieces published of that author, and an inspirational letter from David H. Keller, M.D., at that time probably the most popular author writing for the fantasy magazines. A "Keller-yarn" "The Living Machine", was scheduled for the unpublished sixth issue of *Science Fiction.* Later that story appeared in the May, 1935 *Wonder Stories.*

The magazine started as a monthly, but gaps between issues became greater and greater. The last issue, Number 5, which was neither dated or numbered, showed some hopeful improvement. Its cover and one interior had been drawn by Clay Ferguson, Jr. (an extremely competent young artist of that period), whose illustrations were appearing in the semi-professional *Marvel Tales* and *Science Fiction Digest.* Schuster's own illustrations were outstanding. The magazine had a story by the early woman science fiction writer, Clare Winger Harris, "The Vibrometer," which added nothing to her reputation.

However, already the ambitious Siegel had placed a story with T. O'Conner Sloane, then editor of *Amazing Stories.* The story, written under the pen name of Bernard J. Kenton, was titled, "Miracles on Antares." As was typical of the perennially overstocked Teck *Amazing,* the manuscript was held five years without being published and then, presumably, returned to its author. This showed that Siegel did have a certain amount of story telling ability, but more significant was the statement made in a biographical sketch of Siegel, written in the third person and published in the last issue of *Science Fiction.* It read: "He is at present working upon a scientific fiction cartoon strip with an artist of great renown."

The artist of "great renown" was Joseph Schuster and the cartoon strip, if you do not already know, was Superman. Many years of peddling the idea from publisher to publisher were to ensue before one of them was to give the strip a break in *Action Comics,* which was started to keep a New Jersey printer's presses busy during the depths of the depression. The strip caught on immediately. Its publishers discovered that youngsters were going up to

newsdealers and asking for: "The magazine with Superman," and so a fabulous publishing success story was launched.

A final chapter in the story is that charter subscribers to *Science Fiction*, Julius Schwartz and Mort Weisinger—who also coedited *Science Fiction Digest* contemporarily with *Science Fiction*—now edit the Superman comic group, while its originators, Siegel and Schuster, own no rights in the enterprise, and no longer have any connection with the strip.

THE FAN PRESS

INSIDE SCIENCE FICTION: 30¢ for a sample, or 4 issues for $1, from Ron Smith, Box 356, Times Square Station, New York 36, New York. Formerly titled simply *Inside*, the words "Science Fiction" have now been added for reasons of clarity. Interesting thought: *Inside Science Fiction* is now being reviewed in "Inside Science Fiction." In reality, this publication is more than a fanzine; it is a journal of literary criticism and is the most ambitious magazine emanating from the s-f's inner-circle. The current issue contains 64 photo-offset pages, impeccably produced. The first 16 pages feature a very clever burlesque of *Astounding Science Fiction* which must be read to be appreciated. Dave Foley, assisted by Bob Briney, have captured the atmosphere of their model to such a degree that it's almost uncanny.

Two of the feature articles this issue are quite controversial—in line with Ron Smith's obvious editorial policy. The first, "The Writing of Science Fiction," by James E. Gunn, concerns itself with "maturity" in science fiction. With very few exceptions, says Gunn, science fiction writers are not mature, but only "gifted amateurs". That is, only the best are gifted amateurs—the rest being somewhat ungifted. Gunn compares the science fiction writer with outstanding writers of general literature, such as Flaubert, and finds them wanting. Almost invariably the science fiction writer, states Gunn, is lacking in the arts of one or more of the following: the *milieu*, or cultural and sociological setting; narration; and the symbol.

It seems to us that, in many instances, the *milieu* is exceptional in s-f stories. In fact, it is so adequately constructed that, in some stories, there would be little remaining without it. A case in point is Pohl and Kornbluth's "Gravy Planet." Another recent one which comes to mind is Phil Farmer's "The Lovers." Even in some of the more obscure short stories, such as those by Irving Cox,

Jr., the milieu is firmly established. In some stories—particularly the gadget story—there is little need for milieu development.

Narration we will skip, except to say that Gunn is correct when he says that many readers do not like first person narration. The symbol is Gunn's third point. Not enough of symbolism in s-f, says Gunn. In fact, such stories are so few that Gunn was compelled to use his own novel, "This Fortress World," as an example. After mentioning that not one critic or reviewer caught the intended s y m b o l i s m, Gunn explained the significance behind his story. As he says, however, "It is better to explain too little about one's work than too much." In brief, a thought-provoking article.

"Conformity in S c i e n c e Fiction," by Bob Leman is an outburst against plots involving what the author terms, "the liberal left." The author is undoubtedly a member of the conservative right. He decries the fact that s-f is pro-intellectualism rather than anti; that it is pro-union; that it is anti-congressional investigation; that it is anti-war. The authors, in utilizing such plots, are being conformist, says Leman. In reality, there is truth in what Leman says. Science fiction has *always* been anything but conservative when applied to economics, sociology, or culture. We feel that it never will be. The conformity of science fiction is that it conforms to non-conformity.

This issue also features a clever little short-short, "The Heiresses," by Jeanne Davis, a long article on H. P. Lovecraft by Lin Carter, and 14 pages of book reviews. *Inside Science Fiction* is undoubtedly the best buy of the quarter.

CINCINNATI FANTASY GROUP: 25¢ from Don Ford, Box 19-T, RR #2, Loveland, Ohio. This is a one-shot devoted to the past, present and future of one of the leading science fiction fan groups. It contains nine articles by such as Dale Tarr, C. L. Barrett, Lou Tabakow, Robert A. Madle, H. Ken Bulmer, and others. The club is covered from its early formative stages right up to the present days of Midwestcon fame.

It all started back in 1935, inspired, no doubt, by readers' departments and the formation of the Science Fiction league, when Dale Tarr, Charles R. Tanner and Ross Rocklynne found out that there *were* people in Cincinnati who read science fiction. Only Dale Tarr remains a member today out of that antedeluvian group. Present membership includes Don Ford, Lou Tabakow, C. L.

Barrett, Bea Mahaffey, and about a dozen more. (The great E. E. Smith, Ph.D., is a sort of unofficial member of the group as he seems to associate with them rather extensively.) This one-shot is recommended as a good example of fan history.

THE NEW FUTURIAN: Edited by J. Michael Rosenblum, Leeds', England. American representative Bob Pavlat, 6001 43rd Avenue, Hyattsville, Md. 15¢ for a sample copy. Mike Rosenblum is a fan of the old school. In fact, he is one of the original members of British fandom and helped sponsor the first British convention, held in Leeds, February, 1937. Present at that historic affair were other then-active fans, such as Ted Carnell, Eric Frank Russell, and Arthur C. Clarke. Mike's fan magazine in the early days was called *The Futurian.* During the war the title was changed to *Futurian War Digest.* After the war, both Mike and his fan publications faded away. However, in 1954 Mike appeared on the scene again with his *The New Futurian,* undoubtedly the best of all of his fan publications.

This is not a magazine for the active fan: that is, the fan who is interested only in fan activities and whose interest in science fiction *per se* is negligible, if it exists at all. *The New Futurian* is a magazine for the collector, the bibliophile, the historian. In short, it is a magazine which can be recommended to all serious readers of science fiction.

An interesting feature of the magazine is "The Clamorous Dreamers," the story of British science fiction fandom. It is written by Walter H. Gillings, undoubtedly Britain's first fan and, in fact, perhaps even *science fiction's* first fan. At least he was in correspondence with other readers of *Amazing Stories* as early as 1927! Gillings tells, in great detail, how he wanted to publish a science fiction magazine and his trials and tribulations in convincing the British publisher of the worthiness of such a thing. He succeeded admirably, however, in 1939 when his *Tales of Wonder* appeared. It lasted until 1943 when, because of the extreme paper-shortage, it died. But "The Clamorous Dreamers" is more than just Walter's efforts to become a magazine editor; it is the history of all aspects of British science fic-

[*Turn Page*]

tion, for Gillings was affiliated with all aspects. The current issue of *New Futurian* contains chapter 6, and Gillings is only up to 1935! Gillings is doing for British science fiction in "The Clamorous Dreamers" what Sam Moskowitz did for American science fiction in "The Immortal Storm."

Book reviews, discussion columns, literary commentaries and analyses make up the major portion of the magazine. Some of the more prominent writers who contribute regularly to *The New Futurian* are Harry Warner, Jr., John F. Burke, John Christopher, John H. Brunner, and Vincent Clarke. *The New Futurian* is highly recommended.

STELLAR: 15¢ a copy, two for 25¢, from Ted E. White, 1014 N. Tuckahoe Street, Falls Church, Virginia. Ted White, we believe, deserves the appellation of "Master of the Mimeograph." He does things with mimeography which are, to be prosaic, out of this world. Any publication with the White insignia is invariably extremely neat, attractive, well-illustrated, and original in format presentation. We have two issues on hand, each of which will be briefly examined.

Issue #13 features an interesting gossip column by Harlan Ellison, another by Harold van Dall (alleged to be the pseudonym of a *real* bigtime writer), several articles by Richard Geis and Randall Garrett, and some rip-roaring fanzine reviews by Franklin Ford, alleged to be the pseudonym of a *real* bigtime fan. Garrett, in "The Bite of the Asp," compares the original manuscript of Phil Farmer's story ("The Bite of the Asp") with its actual appearance in *Science Fiction Plus*, "Biological Revolt." It appears that Gernsback, during the first few issues of *Science Fiction Plus* had a fetish for rewriting. And, to put it mildly, his rewriting wasn't always for the better.

Issue #14, which followed #13 by just several weeks, features Sam Moskowitz, Jack Harness, Richard Geis, and Robert A. Madle. Moskowitz discusses Phil Farmer in general, and "The Lovers" in particular; Jack Harness tells of "The Fan Who Worked Miracles"; Richard Geis talks of pseudo-intellectuals; while Bob Madle pens the first chapter of his trip to the London Science Fiction Convention, "A Fake Fan in London." To sum up *Stellar* in three words: "We like it!"

VARIOSO: 15¢ a copy from John Magnus, Jr., 6 South Franklintown Road, Baltimore 23, Maryland. Another piece of excellent mim-

eography, and an example of amateur journalism at its best. Editor Magnus has a few well-chosen words to say about people referring to s-f as entertainment only. Editor Magnus then has a few well-chosen words to say about a certain type of science fiction. His article, "Duck! David Gordon!" is inspired by David Gordon's "Look Out! Duck!" which was published in *Astounding* for September, 1957. Magnus points out rather preceptively that the story isn't even science fiction but, as he puts it, "It is simply a barnyard comedy laced out to the stars." We'd like to see a sequel to this article by David Gordon, whoever he might be. Editor Magnus also has some well-chosen words to say about the science fiction movie in general in his, "A Hornbook for Movie Reviewers." In Short, Editor Magnus has some well-chosen words to say about many things.

BEFORE closing, we'd like to say a few words about 1958's *World Science Fiction Convention*. It will be held in Los Angeles August 29, 30, 31, and September 1 at the Hotel Alexandria, Fifth and Spring Streets. The convention committee includes Anna Moffatt, Len Moffatt, Rog Phillips, Forrest J. Ackerman, and gobs of others. A $1 bill will provide a membership card, program booklet, and progress reports, whether you attend or not. Send it right away to: Rick Sneary, Treasurer, 2962 Santa Ana Street, South Gate, California. Remember: It's Southgate in 58!"

All fanzines for review, correspondence, and inquiries should be sent to: Robert A. Madle, 7720 Oxman Road, Hyattsville, Maryland.

SCIENCE FICTION ALMANAC

The dates listed are those that appeared on the magazines, rather than the dates when they appeared on the newsstands.

MAY

1923: (marginal) *Weird Tales* now large size.

1929: *Amazing Stories* now a Teck publication; Arthur J. Lynch, editorial director; T. O'Conor Sloane, editor.

1930: Final issue of *Air Wonder Stories*, Vol. 1, No. 11.

1934: Hugo Gernsback inaugurates Science Fiction League in *Wonder Stories*.

1939: *Fantastic Adventures*, Vol. 1, No. 1; large size; bi-monthly; Raymond A. Palmer, editor.

1950: *Future combined with Science Fiction Stories*, Vol. 1, No. 1; pulp size; bi-monthly; Robert W. Lowndes, editor.
Wonder Stories Annual, Vol. 1, No. 1; pulp size; Sam Merwin, Jr., editor.
(marginal) *Fantasy Fiction*, Vol. 1, No. 1; digest size;

quarterly; Curtis Mitchell, editor.

1951: *Science Fiction Quarterly,* Vol. 1, No. 1; pulp size; Robert W. Lowndes, editor.
Marvel Science Stories now digest size.

1952: *S p a c e Science Fiction,* Vol. 1, No. 1; digest size; bi-monthly; Lester del Rey, editor.
Future Science Fiction Stories becomes *Future Science Fiction.*
Final issue of *Marvel Science Stories,* Vol. 3, No. 6.

1953: *V o r t e x Science Fiction,* Vol. 1, No. 1; (no frequency listed); Chester Whitehorn, editor.

JUNE

1927: *Amazing Stories Annual;* large size; Hugo Gernsback, editor.

1929: *Science Wonder Stories,* Vol. 1, No. 1; large size; Hugo Gernsback, editor.

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1930: *Science Wonder Stories* combines with *Air Wonder Stories* to become *Wonder Stories.*
(marginal) *Scientific Detective Monthly* becomes *Amazing Detective Tales.*

1931: Final issue of *Miracle Science and Fantasy Stories* (dated June-July); Vol. 1, No. 2.

1938: *Amazing Stories* now a Ziff-Davis publication; Raymond A. Palmer, editor.

1951: (marginal) Final issue of *Fantastic Novels,* Vol. 5, No. 1.

1952: *Fantastic,* Vol. 1, No. 1; digest size; bi-monthly; Howard Browne, editor.

1953: *Fantastic Universe,* Vol. 1, No. 1; digest size; bi-monthly; Sam Merwin, Jr., editor.
Universe Science Fiction, Vol. 1, No. 1; digest size; bi-monthly; George Bell, editor.
Future Science Fiction now digest size.
Final issue of *Space Stories,* Vol. 1, No. 5.

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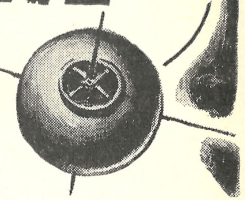

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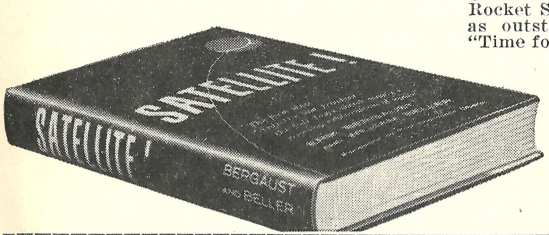

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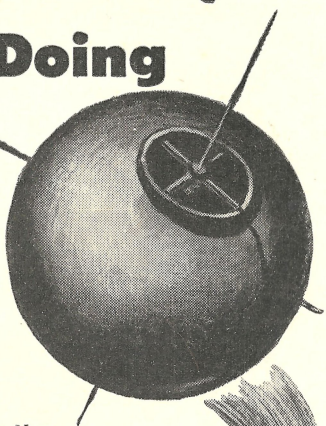

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