WORLDS OF

SEPTEMBER 1962 ● 35c

if SCIENCE FICTION

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THE SNOWBANK ORBIT

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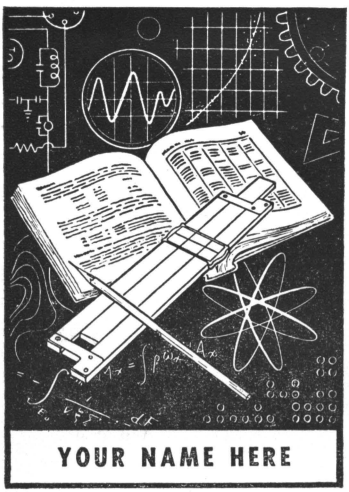

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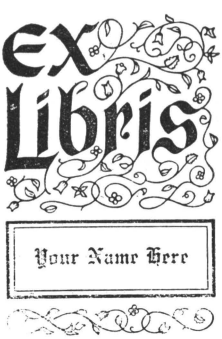

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worlds of if science fiction

September 1962
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NOVELETTES

The Snowbank Orbit *by Fritz Leiber 8*
The Winning of the Moon *by Kris Neville 28*
The Big Headache *by Jim Harmon 49*
Once Around Arcturus *by Joseph Green 70*
Cultural Exchange *by Keith Laumer 107*

SHORT STORIES

1,492,633 Marlon Brandos *by Vance Aandahl 24*
And Then There Was Peace *by Gordon R. Dickson 46*
Transient *by William Harris 65*
World in a Mirror *by Albert Teichner 94*

SPECIAL FEATURES

The Worlds of Science *Editorial 5*
You and Nostradamus — *Continued 92*
"Just Westing" *by Theodore Sturgeon 101*
Hue and Cry *125*

Cover by Wenzel from The Snowbank Orbit

Next issue (November) on sale September 13th

IF published bi-monthly by Digest Productions Corporation, Vol. 12, No. 4 Main Office: 421 Hudson Street, New York 14, New York 35c per copy. Subscriptions 12 issues $3.00 in the United States, Canada, Mexico, South and Central America and U. S. possessions, elsewhere $4.00. Second-class postage paid at New York, New York, and at additional mailing offices. Printed in the U. S. A. by the Guinn Company, Inc., New York 14, N. Y.

THE WORLDS OF SCIENCE

JUST at press time, we received a package in the mail and found it of such immediate interest that we empty it herewith into your lap. Brevity is the soul of speed. These short notes can't begin to do full justice to THE WORLDS OF SCIENCE, a handsome new series from Pyramid. Six books have been released at this writing. They are:

THE HUMAN BRAIN, by John Pfeiffer. This a general reader's study of the brain, what it is, how it works, how it goes wrong and what can be done about it when it does. The author has an engaging style, running strongly to illustrative anecdote. Some of this material is really fascinating, such as the minute description of the stereotaxic surgery techniques which are replacing lobotomies, and such as-yet-unexplained phenomena as the fact that "Wizard-of-Oz" (i.e., green) eyeglasses can prevent certain types of epileptic seizures, and that in many cases blood tests can indicate psychotic "explosions" before they occur.

MAYA, by Charles Gallenkamp. Photographs, most by the author. For many years the rise and fall of the rich and highly-developed Mayan empire, which reached its peak more than a thousand years ago, has been regarded as an "impenetrable" mystery. The penetration of it reads like the most exciting of detective stories, which of course it is. Mr. Gallenkamp writes like a lover (well, perhaps more clear-eyed than that!) on Maya in particular and archaeology in general, so that one gets, as a sort of side bonus, generous helpings of the history and techniques of this entrancing field of work, and also of its value; for archaeology, especially of isolated cultures, helps immeasurably in the understanding of the anatomy of civilization.

This book goes back to the dim origins of Maya, follows it to its heights, studies its religion and daily life, its cataclysmic collision with the Spaniards and its still mysterious extinction.

NINE PLANETS, by Alan E. Nourse. Many line cuts, and a section of Mel Hunter paintings. A glance through this marvelous (a word here carefully chosen) book makes one wonder if Nourse is soaked in sf or sf writers soaked in Nourse. Here in clear logical explication are such fan's delights as the "brightside crossing" of Mercury, asteroid mining, the possibility of artifacts on cosmic debris and many, many more. The author takes off from the earliest recorded yarns of space-flight, goes on to the birth and nature of the sun and the planetary system, and then subjects each of the planets to as thorough an examination as his great erudition and powerful imagination can give. He concludes with a chapter on solar systems beyond the sun and two appendices, one on comparative statistics, the other a glossary.

LIVING EARTH, by Peter Farb. If you had the indescribable experience of being hooked, as a child, by Henri Fabre or Maeterlinck, you will certainly find in this book the growing excitement which promises you a similar delight. For Farb has a similar gift: the ability to observe acutely, describe accurately—and write like a poet. "The slime mold moves, not like a four-footed beast, but like a one-celled protozoan. It ventures out of the soil and migrates at the pace of a slug to exposed positions on rocks and logs. There, in only a few hours, the slimy mass transforms itself into a bouquet of fantastic flowers —wispy things on slender stalks, clusters of exotic blossoms, puffballs, colored cups, toadstools. The animal has become a plant, one of the most beautiful objects of the soil." This is a book—possibly the only book—about life in the soil, and it covers a staggering amount of information on extremely diverse fields.

CHEMISTRY CREATES A NEW WORLD. If you know no more about chemistry than how to spell it, Jaffe will competently take you through a definition of it, a survey of the whole field, its history and its symbols; and finally to an item-by-item examination of certain broad specialties in which new worlds are coming to light: medicines, foods, metals, synthetic gasoline and rubber and fibers, new elements, and atomic energy. By the time he's done with you, you will take far less for granted those nylon socks, that wormless apple, that tire that waited for

24,000 miles before its first puncture. Jaffe's real specialty: telling you *how*.

THE ROAD TO MAN, by Herbert Wendt. Wendt, though no slouch as a writer himself, has a talent that amounts to genius for finding quotations from works new and old, from many different European and American sources, to add color and depth and change-of-pace to his own vivid narrations. He is generous with this gift, so that the sense of color in this unusual book is at times almost overwhelming. The sections of the volume (each with a half-dozen or more chapters) give an idea of his approach and its scope: Mother Ocean; The Leap to the Mainland; Into the Atmosphere; The Conquest of the Great Open Spaces; and finally, From Instinct to Thought. With these as milestones, he describes life on Earth from its origins through the dazzling diversity of habitat and species, through, at last, the anthropoids up to but not including man.

ALL in all, THE WORLDS OF SCIENCE earns Pyramid some warm congratulations. Good news comes in the package along with these books: a second group of titles is due for release, and will include some originals expressly written for the series. If the publishers can keep up the quality, and avoid the danger of filling holes with whatever is available, they have an opportunity to create as fine a popular science library as has yet been assembled. **END**

THE pole stars of the other planets cluster around Polaris and Octans, but Uranus spins on a snobbishly different axis between Aldebaran and Antares. The Bull is her coronet and the Scorpion her footstool. Dear blowzy old bitch-planet, swollen and pale and cold, mad with your Shakespearean moons, white-mottled as death from Venerean Plague, spinning on your side like a poisoned pregnant cockroach, rolling around the sun like a fat drunken floozie with green hair rolling on the black floor of an infinite barroom, what a sweet last view of the Solar System you are for a cleancut young spaceman...

Grunfeld chopped off that train of thought short. He was young and the First Interstellar War had snatched him up and now it was going to pitch him and twenty other Joes out of the System on a fast curve breaking around Uranus—and so what! He shivered to get a little heat and then applied himself to the occulted star he was tracking through *Prospero's* bridge telescope. The star was a twentieth planetary diameter into Uranus, the crosslines showed—a glint almost lost in pale green. That meant its light was bulleting 1600 miles deep through the seventh planet's thick hydrogen atmosphere, unless he were seeing the star on a

BY FRITZ LEIBER Illustrated by Mack

THE SNOWBANK ORBIT

Earth could not stop the Enemy's remorseless advance from outer space. Neither could the Enemy!

mirage trajectory—and at least its depth agreed with the time since rim contact.

At 2000 miles he lost it. That should mean 2000 miles plus of hydrogen soup above the methane ocean, an America-wide layer of gaseous gunk for the captain to play the mad hero in with the fleet.

Grunfeld didn't think the captain wanted to play the mad hero. The captain hadn't gone space-simple in any obvious way like Croker and Ness. And he wasn't, like Jackson, a telepathy-racked visionary entranced by the Enemy. Worry and responsibility had turned the captain's face into a skull which floated in Grunfeld's imagination when he wasn't actually seeing it, but the tired eyes deep-sunk in the dark sockets were still cool and perhaps sane. But because of the worry the captain always wanted to have the last bit of fact bearing on the least likely maneuver, and two pieces of evidence were better than one. Grunfield found the next sizable star due to occult. Five-six minutes to rim contact. He floated back a foot from the telescope, stretching out his thin body in the plane of the ecliptic—strange how he automatically assumed that orientation in free fall! He blinked and blinked, then rested his eyes on the same planet he'd been straining them on.

The pale greenish bulk of Uranus was centered in the big bridge spaceshield against the black velvet dark and bayonet-bright stars, a water-splotched and faded chartreuse tennis ball on the diamond-spiked bed of night. At eight million miles she looked half the width of Luna seen from Earth. Her whitish equatorial bands went from bottom to top, where, Grunfeld knew, they were spinning out of sight at three miles a second —a gelid waterfall that he imagined tugging at him with ghostly green gangrenous fingers and pulling him over into a hydrogen Niagara.

Half as wide as Luna. But in a day she'd overflow the port as they whipped past her on a near miss and in another day she'd be as small as this again, but behind them, sunward, having altered their outward course by some small and as yet unpredictable angle, but no more able to slow *Prospero* and her sister ships or turn them back at their 100 miles a second than the fleet's solar jets could operate at this chilly distance from Sol. G'by, fleet. G'by, C.C.Y. spaceman.

GRUNFELD looked for the pale planet's moons. Miranda and Umbriel were too tiny to make disks, but he distinguished Ariel four diameters above the planet and Oberon a dozen below. Spectral sequins. If the fleet were going to get a radio signal from any of them, it would have to be Titania, occulted

now by the planet and the noisy natural static of her roiling hydrogen air and seething methane seas—but it had always been only a faint hope that there were survivors from the First Uranus Expedition.

Grunfeld relaxed his neck and let his gaze drift down across the curving star-bordered forward edge of *Prospero's* huge mirror and the thin jutting beams of the port lattice arm to the dim red-lit gages below the spaceshield.

Forward Skin Temperature seven degrees Kelvin. Almost low enough for helium to crawl, if you had some helium. *Prospero's* insulation, originally designed to hold out solar heat, was doing a fair job in reverse.

Aft (sunward) Skin Temperature 75 degrees Kelvin. Close to that of Uranus' sunlit face. Check.

Cabin Temperature 43 degrees Fahrenheit. Brr! The Captain was a miser with the chem fuel remaining. And rightly...if it were right to drag out life as long as possible in the empty icebox beyond Uranus.

Gravities of Acceleration zero. Many other zeros.

The four telltales for the fleet unblinkingly g l o w e d dimmest blue—one each for *Caliban*, *Snug*, *Moth*, and *Starveling*, following *Prospero* in line astern on slave automatic—though for months inertia had done all five ships' piloting. Once the buttons had been green, but they'd wiped that color off the boards because of the Enemy.

The gages still showed their last maximums. Skin 793 Kelvin, Cabin 144 Fahrenheit, Gravs 3.2. All of them hit almost a year ago, when they'd been ace-ing past the sun. Grunfield's gaze edged back to the five bulbous pressure suits, once more rigidly upright in their braced racks, that they'd been wearing during that stretch of acceleration inside the orbit of Mercury. He started. For a moment he'd thought he saw the dark-circled eyes of the captain peering between two of the bulging b l a c k suits. Nerves! The captain had to be in his cabin, readying alternate piloting programs for Copperhead.

Suddenly Grunfeld jerked his face back toward the spaceshield—so violently that his body began very slowly to spin in the opposite direction. This time he'd thought he saw the Enemy's green flashing near the margin of the planet—bright green, viridian, far vivider than that of Uranus herself. He drew himself to the telescope and feverishly studied the area. Nothing at all. Nerves again. If the Enemy were much nearer than a light-minute, Jackson would esp it and give warning. The next star was still three minutes from rim contact. Grunfeld's mind retreated to the

circumstances that had brought *Prospero* (then only *Mercury One)* out here.

II

WHEN the First Interstellar War erupted, the pioneer fleets of Earth's nations had barely pushed their explorations beyond the orbit of Saturn. Except for the vessels of the International Meteor Guard, spaceflight was still a military enterprise of America, Russia, England and the other mega-powers.

During the first months the advantage lay wholly with the slim black cruisers of the Enemy, who had an antigravity which allowed them to hover near planets without going into orbit; and a frightening degree of control over light itself. Indeed, their principal weapon was a tight beam of visible light, a dense photonic stiletto with an effective range of several Jupiter-diameters in vacuum. They also used visible light, in the green band, for communication as men use radio, sometimes broadcasting it and sometimes beaming it loosely in strange abstract pictures that seemed part of their language. Their gravity-immune ships moved by reaction to photonic jets the tightness of which rendered them invisible except near the sun, where they tended to ionize electronically dirty volumes of space. It was probably this effective invisibility, based on light-control, which allowed them to penetrate the Solar System as deep as Earth's orbit undetected, rather than any power of travel in time or sub-space, as was first assumed. Earthmen could only guess at the physical appearance of the Enemy, since no prisoners were taken on either side.

Despite his impressive maneuverability and armament, the Enemy was oddly timid about attacking live planets. He showed no fear of the big gas planets, in fact hovering very close to their turgid surfaces, as if having some way of fueling from them.

Near Terra the first tactic of the black cruisers, after destroying Lunostrovok and Circumluna, was to hover behind the moon, as though sharing its tide-lockedness—a circumstance that led to a sortie by Earth's Combined Fleet, England and Sweden excepted.

At the wholly disastrous Battle of the Far Side, which was visible in part to naked-eye viewers on Earth, the Combined Fleet was annihilated. No Enemy ship was captured, boarded, or seriously damaged—except for one which, apparently by a fluke, was struck by a fission-headed anti-missile and proceded after the blast to "burn," meaning that it suffered a slow and puzzling disintegration, accompanied by a dazzling rainbow display of visible radia-

tion. This was before the "stupidity" of the Enemy with reguard to small atomic missiles was noted, or their allergy to certain radio wave bands, and also before Terran telepaths began to claim cloudy contact with Enemy minds.

Following Far Side, the Enemy burst into activity, harrying Terran spacecraft as far as Mercury and Saturn, though still showing great caution in maneuver and making no direct attacks on planets. It was as if a race of heavily armed marine creatures should sink all ocean-going ships or drive them to harbor, but make no assaults beyond the shore line. For a full year Earth, though her groundside and satellite rocketyards were furiously busy, had no vehicle in deep space—with one exception.

AT the onset of the War a fleet of five mobile bases of the U. S. Space Force were in Orbit to Mercury, where it was intended they take up satellite positions prior to the prospecting and mineral exploitation of the small sun-blasted planet. These five ships, each with a skeleton five-man crew, were essentially Ross-Smith space stations with a solar drive, assembled in space and intended solely for space-to-space flight inside Earth's orbit. A huge paraboloid mirror, its diameter four times the length of the ship's hull, superheated at its focus the hydrogen which was ejected as a plasma at high exhaust velocity. Each ship likewise mounted versatile radio-radar equipment on dual lattice arms and carried as ship's launch a two-man chemical fuel rocket adaptable as a fusion-headed torpedo.

After Far Side, this "tin can" fleet was ordered to bypass Mercury and, tacking on the sun, shape an orbit for Uranus, chiefly because that remote planet, making its 84-year circuit of Sol, was currently on the opposite side of the sun to the four inner planets and the two nearer gas giants Jupiter and Saturn. In the empty regions of space the relatively defenseless fleet might escape the attention of the Enemy.

However, while still accelerating into the sun for maximum boost, the fleet received information that two Enemy cruisers were in pursuit. The five ships cracked on all possible speed, drawing on the solar drive's high efficiency near the sun and expending all their hydrogen and most material capable of being vaporized, including some of the light-metal hydrogen storage tanks—like an old steamer burning her cabin furniture and the cabins themselves to win a race. Gradually the curving course that would have taken years to reach the outer planet flattened into a hyperbola that would make the journey in 200 days.

In the asteroid belt the pursuing cruisers turned aside to join in the crucial Battle of the Trojans with Earth's largely new-built, more heavily and wisely armed Combined Fleet—a battle that proved to be only a prelude to the decisive Battle of Jupiter.

Meanwhile the five-ship fleet sped onward, its solar drive quite useless in this twilight region even if it could have scraped together the needed boilable ejectant mass to slow its flight. Weeks became months. The ships were renamed for the planet they were aimed at. At least the fleet's trajectory had been truly set.

Almost on collision course it neared Uranus, a mystery-cored ball of frigid gas 32,000 miles wide coasting through space across the fleet's course at a lazy four miles a second. At this time the fleet was traveling at 100 miles a second. Beyond Uranus lay only the interstellar night, into which the fleet would inevitably vanish...

UNLESS, Grunfeld told himself...unless the fleet shed its velocity by ramming the gaseous bulk of Uranus. This idea of atmospheric braking on a grand scale had sounded possible at first suggestion, half a year ago—a little like a man falling off a mountain or from a plane and saving his life by dropping into a great thickness of feathery new-fallen snow.

Supposing her solar jet worked out here and she had the reaction mass, *Prospero* could have shed her present velocity in five hours, decelerating at a comfortable one G.

But allowing her 12,000 miles of straight-line travel through Uranus' frigid soupy atmosphere—and that might be dipping very close to the methane seas blanketing the planet's hypothetical mineral core—*Prospero* would have two minutes in which to shed her velocity.

Two minutes—at 150 Gs.

Men had stood 40 and 50 Gs for a fractional second.

But for two minutes... Grunfeld told himself that the only surer way to die would be to run into a section of the Enemy fleet. According to one calculation the ship's skin would melt by heat of friction in 90 seconds, despite the low temperature of the abrading atmosphere.

The star Grunfeld had been waiting for touched the hazy rim of Uranus. He drifted back to the eyepiece and began to follow it in as the pale planet's hydrogen muted its diamond brilliance.

III

IN the aft cabin, lank hairy-wristed Croker pinned another blanket around black Jackson as the latter shivered

in his trance. Then Croker turned on a small light at the head of the hammock.

"Captain won't like that," plump pale Ness observed tranquilly from where he floated in womb position across the cabin. "Enemy can feel a candle of *our* light, captain says, ten million miles away." He rocked his elbows for warmth and his body wobbled in reaction like a pollywog's.

"And Jackson hears the Enemy think...and Heimdall hears the grass grow," Croker commented with a harsh manic laugh. "Isn't an Enemy for a billion miles, Ness." He launched aft from the hammock. "We haven't spotted their green since Saturn orbit. There's nowhere for them."

"There's the far side of Uranus," Ness pointed out. "That's less than ten million miles now. Eight. A bare day. They could be there."

"Yes, waiting to bushwack us as we whip past on our way to eternity," Croker chuckled as he crumpled up against the aft port, shedding momentum. "That's likely, isn't it, when they didn't have time for us back in the Belt?" He scowled at the tiny white sun, no bigger a disk than Venus, but still with one hundred times as much light as the full moon pouring from it—too much light to look at comfortably. He began to button the inner cover over the port.

"Don't do that," Ness objected without conviction. "There's not much heat in it but there's some." He hugged his elbows and shivered. "I don't remember being warm since Mars orbit."

"The sun gets on my nerves," Croker said. "It's like looking at an arc light through a pinhole. It's like a high, high jail light in a cold concrete yard. The stars are highlights on the barbed wire." He continued to button out the sun.

"You ever in jail?" Ness asked. Croker grinned.

WITH the tropism of a fish, Ness began to paddle toward the little light at the head of Jackson's hammock, flicking his hands from the wrists like flippers. "I got one thing against the sun," he said quietly. "It's blanketing out the radio. I'd like us to get one more message from Earth. We haven't tried rigging our mirror to catch radio waves. I'd like to hear how we won the battle of Jupiter."

"If we won it," Croker said.

"Our telescopes show no more green around Jove," Ness reminded him. "We counted 27 rainbows of Enemy cruisers 'burning.' Captain verified the count."

"Repeat: if we won it." Croker pushed off and drifted back toward the hammock. "If there was a real victory message they'd push it through, even if the sun's in the way

and it takes three hours to catch us. People who win, shout."

Ness shrugged as he paddled. "One way or the other, we should be getting the news soon from Titania station," he said. "They'll have heard."

"If they're still alive and there ever was a Titania Station," Croker amended, backing air violently to stop himself as he neared the hammock. "Look, Ness, we know that the First Uranus Expedition arrived. At least they set off their flares. But that was three years before the War and we haven't any idea of what's happened to them since and if they ever managed to set up housekeeping on Titania—or Ariel or Oberon or even Miranda or Umbriel. At least if they built a station could raise Earth I haven't been told. Sure thing *Prospero* hasn't heard anything...and we're getting close."

"I won't argue," Ness said. "Even if we raise 'em, it'll just be hello-goodby with maybe time between for a battle report."

"And a football score and a short letter from home, ten seconds per man as the station fades." Croker frowned and added, "If Captain had cottoned to my idea, two of us at any rate could have got off this express train at Uranus."

"Tell me how," Ness asked drily.

"How? Why, one of the ship's launches. Replace the fusion-head with the cabin. Put all the chem fuel in the tanks instead of divvying it between the ship and the launch."

"I haven't got the brain for math Copperhead has, but I can subtract," Ness said, referring to *Prospero's* piloting robot. "Fully fueled, one of the launches has a max velocity change in free-fall of 30 miles per second. Use it all in braking and you've only taken 30 from 100. The launch is still going past Uranus and out of the system at 70 miles a second."

"You didn't hear all my idea," Croker said. "You put piggyback tanks on your launch and top them off with the fuel from the other four launches. Then you've 100 miles of braking *and* a maneuvering reserve. You only need to shed 90 miles, anyway. Ten miles a second's the close circum-Uranian velocity. Go into circum-Uranian orbit and wait for Titania to send their jeep to pick you up. Have to start the maneuver four hours this side of Uranus, though. Take that long at 1 G to shed it."

"Cute," Ness conceded. "Especially the jeep. But I'm glad just the same we've got 70 per cent of our chem fuel in our ships' tanks instead of the launches. We're on such a bull's eye course for Uranus —Copperhead really pulled a miracle plotting our orbit—that we may need a sidewise

shove to miss her. If we slapped into that cold hydrogen soup at our 100 mps—"

Croker shrugged. "We still could have dropped a couple of us," he said.

"CAPTAIN'S got to look after the whole fleet," Ness said. "You're beginning to agitate, Croker, like you was Grunfeld—or the captain himself."

"But if Titania Station's alive, a couple of men dropped off would do the fleet some good. Stir Titania up to punch a message through to Earth and get a really high-speed retrieve-and-rescue ship started out after us. *If* we've won the War."

"But Titania Station's dead or never was, not to mention its jeep. And we've lost the Battle of Jupiter. You said so yourself," Ness asserted owlishly. "Captain's got to look after the whole fleet."

"Yeah, so he kills himself fretting and the rest of us die of old age in the outskirts of the Solar System. Join the Space Force and See the Stars! Ness, do you know how long it'd take us to reach the nearest star—except we aren't headed for her—at our 100 mps? Eight thousand years!"

"That's a lot of time to kill," Ness said. "Let's play chess."

Jackson sighed and they both looked quickly at the dark unlined face above the cocoon, but the lips did not flutter again, or the eyelids. Croker said, "Suppose he knows what the Enemy looks like?"

"I suppose," Ness said. "When he talks about them it's as if he was their interpreter. How about the chess?"

"Suits. Knight to King Bishop Three."

"Hmm. Knight to King Knight Two, Third Floor."

"Hey, I meant flat chess, not three-D," Croker objected.

"That thin old game? Why, I no sooner start to get the position really visualized in my head than the game's over."

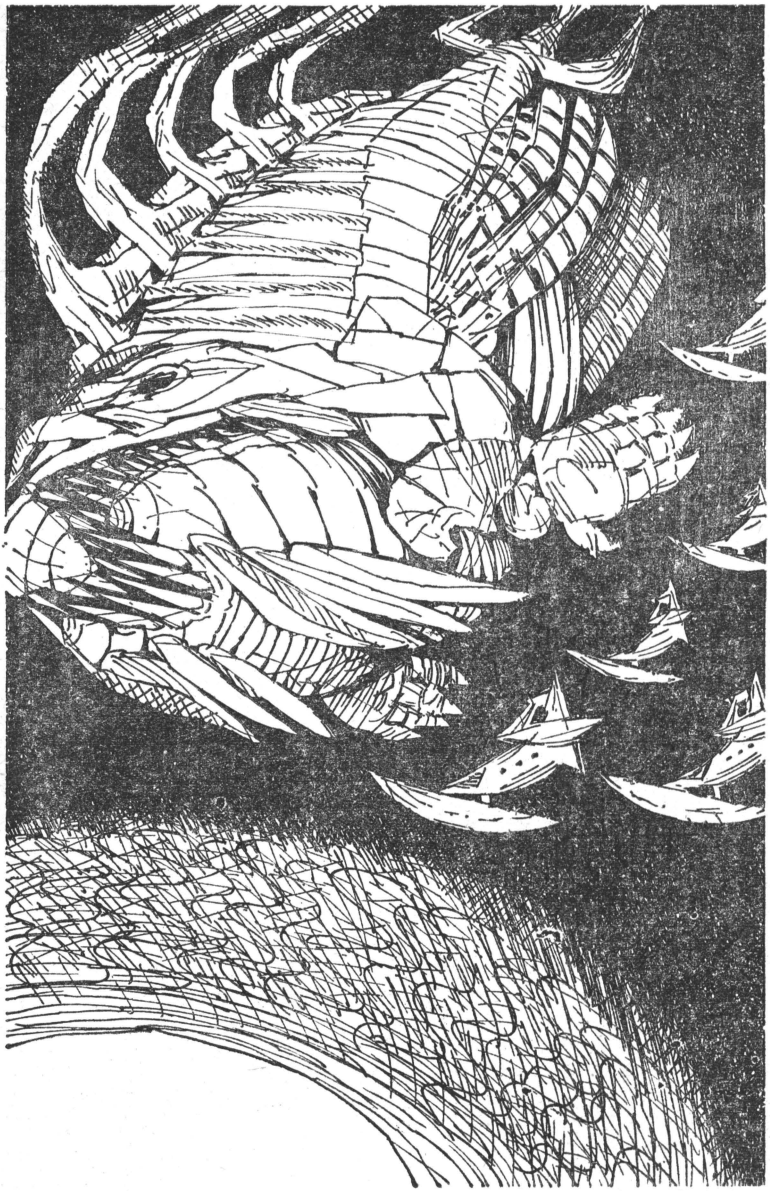
"I don't want to start a game of three-D with Uranus only 18 hours away."

Jackson stirred in his hammock. His lips worked. "They..." he breathed. Croker and Ness instantly watched him. "They..."

"I wonder if he is really inside the Enemy's mind?" Ness said.

"He thinks he speaks for them," Croker replied and the next instant felt a warning touch on his arm and looked sideways and saw dark-circled eyes in a skull-angular face under a battered cap with a tarnished sunburst. Damn thought Croker, how does the captain always know when Jackson's going to talk?

"They are waiting for us on the other side of Uranus," Jackson breathed. His lips trembled into a smile and his voice grew a little louder,



though his eyes stayed shut. "They're welcoming us, they're our brothers." The smile died. "But they know they got to kill us, they know we got to die."

The hammock with its tight-swathed form began to move past Croker and he snatched at it. The captain had pushed off from him for the hatch leading forward.

GRUNFELD was losing the new star at 2200 miles into Uranus when he saw the two viridian flares flashing between it and the rim. Each flash was circled by a fleeting bright green ring, like a mist halo. He thought he'd be afraid when he saw that green again, but what he felt was a jolt of excitement that made him grin. With it came a touch on his shoulder. He thought, the captain always knows.

"Ambush," he said. "At least two cruisers."

He yielded the eyepiece to the captain. Even without the telescope he could see those incredibly brilliant green flickers. He asked himself if the Enemy was already gunning for the fleet through Uranus.

The blue telltales for *Caliban* and *Starveling* began to blink.

"They've seen it too," the captain said. He snatched up the mike and his next words rang through the *Prospero*.

"Rig ship for the snowbank orbit! Snowbank orbit with stinger! Mr. Grunfeld, raise the fleet."

Aft, Croker muttered, "Rig our shrouds, don't he mean? Rig shrouds and firecrackers mounted on Fourth of July rockets."

Ness said, "Cheer up. Even the longest strategic withdrawal in history has to end some time."

IV

THREE quarters of a day later Grunfeld felt a spasm of futile fear and revolt as the pressure suit closed like a thick-fleshed carnivorous plant on his drugged and tired body. Relax, he told himself. Fine thing if you cooked up a fuss when even Croker didn't. He thought of forty things to recheck. Relax, he repeated—the work's over; all that matters is in Copperhead's memory tanks now, or will be as soon as the captain's suited up.

The suit held Grunfeld erect, his arms at his sides—the best attitude, except he was still facing forward, for taking high G, providing the ship herself didn't start to tumble. Only the cheekpieces and visor hadn't closed in on his face—translucent handthick petals as yet unfolded. He felt the delicate firm pressure of built-in fingertips monitoring his pulses and against his buttocks the cold smooth muzzles of the jet hy-

podermics that would feed him metronomic drugs during the high-G stretch and stimulants when they were in free-fall again. When.

He could swing his head and eyes just enough to make out the suits of Croker and Ness to either side of him and their profiles wavy through the jutting misty cheekpieces. Ahead to the left was Jackson —just the back of his suit, like a black snowman standing at attention, pale-olive-edged by the great glow of Uranus. And to the right the captain, his legs suited but his upper body still bent out to the side as he checked the monitor of his suit with its glowing blue button and the manual controls that would lie under his hands during the maneuver.

Beyond the captain was the spaceshield, the lower quarter of it still blackness and stars, but the upper three-quarters filled with the onrushing planet's pale mottled green that now had the dulled richness of watered silk. They were so close that the rim hardly showed curvature. The atmosphere must have a steep gradient, Grunfeld thought, or they'd already be feeling decel. That stuff ahead looked more like water than any kind of air. It bothered him that the captain was still half out of his suit.

There should be action and shouted commands, Grunfeld thought, to fill up these last tight-stretched minutes. Last orders to the fleet, port covers being cranked shut, someone doing a countdown on the firing of their torpedo. But the last message had gone to the fleet minutes ago. Its robot pilots were set to follow *Prospero* and imitate, nothing else. And all the rest was up to Copperhead. Still...

Grunfeld wet his lips. "Captain," he said hesitantly. "Captain?"

"Thank you, Grunfeld." He caught the edge of the skull's answering grin. "We *are* beginning to hit hydrogen," the quiet voice went on. "Forward skin temperature's up to 9 K."

Beyond the friendly skull, a great patch of the rim of Uranus flared bright green. As if that final stimulus had been needed, Jackson began to talk dreamily from his suit.

"They're still welcoming us and grieving for us. I begin to get it a little more now. Their ship's one thing and they're another. Their ship is frightened to death of us. It hates us and the only thing it knows to do is to kill us. They can't stop it, they're even less than passengers..."

The captain was in his suit now. Grunfeld sensed a faint throbbing and felt a rush of cold air. The cabin refrigeration system had started up, carrying cabin heat to the lattice arms. Intended to protect them from solar heat, it would now do what it could against the heat of friction.

The straight edge of Uranus was getting hazier. Even the fainter stars shone through, spangling it. A bell jangled and the pale green segment narrowed as the steel meteor panels began to close in front of the spaceshield. Soon there was only a narrow vertical ribbon of green—*bright* green as it narrowed to a thread—then for a few seconds only blackness except for the dim red and blue beads and semicircles, just beyond the captain, of the board. Then the muted interior cabin lights glowed on.

JACKSON droned: "They and their ships come from very far away, from the edge. If this is the continuum, they come from the...discontinuum, where they don't have stars but something else and where gravity is different. Their ships came from the edge on a gust of fear with the other ships, and our brothers came with it though they didn't want to..."

And now Grunfeld thought he began to feel it—the first faint thrill, less than a cobweb's tug, of *weight.*

The cabin wall moved sideways. Grunfeld's suit had begun to revolve slowly on a vertical axis.

For a moment he glimpsed Jackson's dark profile—all five suits were revolving in their framework. They locked into position when the men in them were facing aft. Now at least retinas wouldn't pull forward at high-G decel, or spines crush through thorax and abdomen.

The cabin air was cold on Grunfeld's forehead. And now he was sure he felt weight—maybe five pounds of it. Suddenly aft was *up.* It was as if he were lying on his back on the spaceshield.

A sudden snarling roar came through his suit from the beams bracing it. He lost weight, then regained it and a little more besides. He realized it was their torpedo taking off, to skim by Uranus in the top of the atmosphere and then curve inward the little their chem fuel would let them, homing toward the Enemy. He imaged its tiny red jet over the great gray-green glowing plain. Four more would be taking off from the other ships—the fleet's feeble sting. Like a bee's, just one, in dying.

The cheekpieces and foreheadpiece of Grunfeld's suit began to close on his face like layers of pliable ice.

Jackson called faintly, "*Now* I understand. Their ship—" His voice was cut off.

Grunfeld's ice-mask was tight shut. He felt a small surge of vigor as the suit took over his breathing and sent his lungs a gush of high-oxy air. Then came a tingling numbness as the suit field went on, adding an extra prop against decel to each molecule of his body.

But the weight was growing. He was on the moon now ...now on Mars...now back on Earth...

The weight was stifling now, crushing—a hill of invisible sand. Grunfeld saw a black pillow hanging in the cabin above him aft. It had red fringe around it. It grew.

There was a whistling and shaking. Everything lurched torturingly, the ship's jets roared, everything recovered, or didn't.

The black pillow came down on him, crushing out sight, crushing out thought.

THE universe was a black tingling, a limitless ache floating in a larger black infinity. Something drew back and there was a dry fiery wind on numb humps and ridges—the cabin air on his face, Grunfeld decided, then shivered and started at the thought that he was alive and in freefall. His body didn't feel like a mass of internal hemorrhages. Or did it?

He spun slowly. It stopped. Dizziness? Or the suits revolving forward again? If they'd actually come through—

There was a creaking and cracking. The ship contracting after frictional heating?

There was a faint stink like ammonia and formaldehyde mixed. A few Uranian molecules forced past plates racked by turbulence?

He saw dim red specks. The board? Or last flickers from ruined retinas? A bell jangled. He waited, but he saw nothing. Blind? Or the meteor guard jammed? No wonder if it were. No wonder if the cabin lights were broken.

The hot air that had dried his sweaty face rushed down the front of his body. Needles of pain pierced him as he slumped forward out of the top of his opening suit.

Then he saw the horizontal band of stars outlining the top of the spaceshield and below it the great field of inky black, barely convex upward, *that must,* he realized, *be the dark side of Uranus.*

Pain ignored, Grunfeld pushed himself forward out of his suit and pulled himself past the captain's to the spaceshield.

The view stayed the same, though broadening out: stars above, a curve-edged velvet black plain below. They were orbiting.

A pulsing, color-changing glow from somewhere showed him twisted stumps of the radio lattices. There was no sign of the mirror at all. It must have been torn away, or vaporized completely, in the fiery turbulence of decel.

New maxs showed on the board: Cabin Temperature 214 F, Skin Temperature 907 K, Gravs 87.

Then in the top of the spacefield, almost out of vision, Grunfeld saw the source of the pulsing glow: two

sharp-ended ovals flickering brightly all colors against the pale starfields, like two dead fish phosphorescing.

"The torps got to 'em," Croker said, pushed forward beside Grunfeld to the right.

"I did find out at the end," Jackson said quietly from the left, his voice at last free of the trance-tone. "The Enemy ships weren't ships at all. They were (there's no other word for it) space animals. We've always thought life was a prerogative of planets, that space was inorganic. But you can walk miles through the desert or sail leagues through the sea before you notice life and I guess space is the same. Anyway the Enemy was (what else can I call 'em?) space-whales. Inertialess space-whales from the discontinuum. Space-whales that ate hydrogen (that's the only way I know to say it) and spat light to move and fight. The ones I talked to, our brothers, were just their parasites."

"That's crazy," Grunfeld said. "All of it. A child's picture."

"Sure it is," Jackson agreed.

From beyond Jackson, Ness, punching buttons, said, "Quiet."

The radio came on thin and wailing with static: "Titania Station calling fleet. We have jeep and can orbit in to you. The two Enemy are dead—the last in the System. Titania Station calling fleet. We have jeep fueled and set to go—"

Fleet? thought Grunfeld. He turned back to the board. The first and last blue telltales still glowed for *Caliban* and *Starveling*. Breathe a prayer, he thought, for *Moth* and *Snug*.

Something else shone on the board, something Grunfeld knew had to be wrong. Three little words: SHIP ON MANUAL.

The black rim of Uranus ahead suddenly brightened along its length, which was very slightly bowed, like a section of a giant new moon. A bead formed toward the center, brightened, and then all at once the jail-yard sun had risen and was glaring coldly through its pinhole into their eyes.

They looked away from it. Grunfeld turned around.

The austere light showed the captain still in his pressure suit, only the head fallen out forward, hiding the skull features. Studying the monitor box of the captain's suit, Grunfeld saw it was set to inject the captain with power stimulants as soon as the Gravs began to slacken from their max.

He realized who had done the impossible job of piloting them out of Uranus.

But the button on the monitor, that should have glowed blue, was as dark as those of *Moth* and *Snug*.

Grunfeld thought, now he can rest. **END**

ONE MILLION FOUR HUNDRED NINETY TWO THOUSAND SIX HUNDRED THIRTY THREE MARLON BRANDOS

She liked the Brando type. The more there was of it, the better! **BY VANCE AANDAHL**

CHESTER McRae. Good old Chet, best man in Accounting. Six feet tall, brown hair, brown eyes. Full of vim and vigor, that was good old Chet.

"God!" he screamed. "They're strangling me, the skunks!" He rose from bed, his face dripping with sweat and his hands trembling like a frightened child's. "They're killing me!" He ran to the bathroom and vomited. His wife was standing by the door when he finished, but he walked past her as if she didn't exist.

"Why, Chester! What's the matter with you?" she asked, trailing him into the bedroom. "I've never heard you talk like that before!" For a moment she stood watching him in numb silence. "For goodness' sake, Chester, why are you getting dressed at three o'clock in the morning?"

"None of your business," he mumbled, setting a firm upper lip and gazing at her with lizard-cold Marlon Brando eyes. He picked up his tie, laughed at it with careless ease and threw it across the room. "See you around, baby," he hissed, zipping up his trousers and walking past her.

"Chester McRae! Where are you going at this time of night? You've got to go to work tomorrow! Don't you love me any more? Chester..."

But her words echoed emptily through Chester McRae's

pleasant little suburban home. Chester was no longer present.

Bartholomew Oliver. Good old Barth, best man on a duck hunt since the guy who invented shotguns. Five foot ten, weak chin, gambler's mustache. Good man with small-town girls, too.

"Hey, Thelma," he said. "You know what I think?"

"Go to sleep."

"I think it'd be funnier than hell if I left you flat."

"What kind of wisecrack is that? And what do you think you're doing?"

"I'm getting dressed..."

"It's three o'clock in the morning."

"So? I don't give a damn."

"You'll come back. Drunken louse."

He laughed softly and smiled at her in the darkness with ice-white Marlon Brando teeth. Then he was gone.

Oswald Williams. Good old Ozzie, best man in the whole philosophy department. Five foot two, one hundred and seven pounds, milky eyes. Wrote an outstanding paper on the inherent fallacies of logical positivism.

"Louise," he whispered, "I feel uneasy. Very uneasy."

His wife lifted her fatty head and gazed happily down at Oswald. "Go to sleep," she said.

"If you'll excuse me, I think that I shall take a walk."

"But, Oswald, it's three o'clock in the morning!"

"Don't be irrational," he whispered. "If I want to take a walk, I shall take a walk."

"Well! I don't think you ought to, or you might catch a cold."

He rose and dressed, donning a tee-shirt and tweed trousers. With snake-swift Marlon Brando hands, he tossed his plaid scarf in her face.

"Excuse me, Louise," he whispered, "but I gotta make it..."

Then, laughing softly, he strode from the room.

AT three o'clock in the morning, even a large city is quiet and dark and almost dead. At times, the city twitches in its sleep; occasionally it rolls over or mutters to itself. But only rarely is its slumber shattered by a scream...

"Johnny! Hey, Johnny!" cries Chester McRae, his eyes as dull and poisonous as two tiny toads.

"Let's make it, man...let's split..." whispers Bartholomew Oliver, one finger brushing his nose like a rattler nosing a dead mouse.

"I don make no move without my boys," says Oswald Williams, his hands curled like scorpion tails.

Together they walk down the street, moving with slow insolence, their lips curled in snarls or slack with indiffer-

ence, their eyes glittering with hidden hatreds. But they are not alone in the city. The college boys are coming, in their dirty jeans and beer-stained tee-shirts; so too are the lawyers, in dusty jackets and leather pants; so come the doctors and the businessmen, on stolen motorcycles; the bricklayers and gas station attendants, the beatniks and dope pushers, the bankers and lifesaving instructors, the butchers, the bakers, the candlestick makers...they are all coming, flocking into the city for reasons not their own, wandering in twos and threes and twenties, all of them sullen and quiet, all of them shuffling beneath darkly-hued clouds of ill intent, all of them proud and deadly and virile, filling the streets by the thousands now, turning the streets into rivers of flesh...

"Hey, Johnny," says Chester, "let's cool this dump."

"Man, let's make it with the skirts," says Bartholomew.

"I don see no skirts," says Chester.

"You pig," snarls Ozzie.

The mob is monstrous now, like a pride of lion cubs, beyond count in their number, without equal in their leonine strength, above the common quick in their immortal pride, milling through the hot black veldt, swarming in the city streets. Millions of them, more than the eye can see or the mind can bear. It seems that no man sleeps, that every male in the great city must walk tonight.

"Johnny," says Chester, "I don dig no chicks on the turf."

"Eeee, colay. What a drag," whispers Bartholomew.

"You goddam logical positivist," snarls Ozzie.

AN uneasy sound ripples through the mob, like the angry hiss of an injured ego, moving from street to street and swelling upward in a sudden, angry roar...they want their women, the dance-hall girls, the young waitresses, the nowhere chicks in five dollar dresses, the Spanish girls with eyes as dark as the Spanish night. And then, as though by accident, one man looks up at the starry sky and sees *her*—sees her standing on a balcony far above them, twenty stories above them, up where the wind can blow her hair and billow her blue dress like an orchid of the night.

She laughs gently, without fear, gazing down at the mindless mob of rebels.

They laugh too, just as gently, their quiet eyes crawling over the sight of her body, far above.

"Thass my chick," whispers Chester.

"Cool it, daddy," says Bartholomew, slipping into a pair of dark glasses and touching his lips with the tip of his tongue. "That skirt is private property."

"You boys may walk and

talk," says Ozzie, "but you don play. You don play with Rio's girl."

Suddenly, angry words and clenched fists erupt from the proud, quiet millions that flood the streets. Suddenly, a roar like the roar of lions rises up and buffets the girl in blue, the girl on the balcony. She laughs again, for she knows that they are fighting for her.

A figure appears on the balcony, next to the girl. The figure is a man, and he too is dressed in blue. Suddenly, just as suddenly as it began, the fighting ceases.

"My God," whispers Chester, his cheeks gone pale, "what am I doing out here?"

"Maybe I got the D.T.s," whispers Bartholomew, "but maybe I don't..." He sits down on the curb and rubs his head in disbelief.

Oswald does not speak. His shame is the greatest. He slinks into the darkness of an alley and briefly wishes for an overcoat.

The pride of lion cubs has been routed, and now they scatter, each one scrambling for his private den of security, each one lost in a wild and nameless fear. In twc and threes and twenties they rush back to their homes, their wives, their endless lives.

Far above, in the apartment with the balcony, a man in blue is chiding a girl in blue.

"That was scarcely reasonable, Dorothy."

"But Daddy, you promised to let me have them for the entire night!"

"Yes, but..."

"I wasn't really going to let them hurt themselves! Really, I wasn't!"

"But, Dorothy—you k n o w these things can get out of hand."

"Oh, but Daddy, you know how I adore strong, quiet, proud men. Rebellious men like Marlon."

"Yes, and you know how *I* adore order and peace. There shall be *no* more riots! And tomorrow our little puppets shall go back to their 'dull' lives, as you so wittily put it, and everything shall be as I wish."

THREE hours later, Chester McRae arose at the sound of the alarm, dressed in a stupor and stumbled into his kitchen for breakfast.

"My goodness, Chester," said his wife, who had already arisen, "you look grouchier than usual! Ha, ha!"

He smiled wanly and opened the morning paper.

Halfway across town, Bartholomew Oliver was still asleep, casually lost in the pleasures of an erotic dream. But Professor Oswald Williams, his tiny jaw unshaven and his eager eyes shot through with fatigue, had been hard at work for three hours, scribbling down his latest exposure of the logical positivists. **END**

The enemy was friendly enough.

Trouble was — their friendship

was as dangerous as their hate!

THE WINNING

BY KRIS NEVILLE **Illustrated by Burns**

GENERAL Finogenov notified Major Winship that the underground blast was scheduled for the following morning.

Major Winship, after receiving the message, discussed precautions with the three other Americans.

Next morning, before the sunlight exploded, the four of them donned their space suits and went and sat outside the dome, waiting. The sun rose with its bright, silent clap of radiance. Black pools of shadows lay in harsh contrast, their edges drawn with geometric precision.

Major Winship attempted unsuccessfully to communicate with Base Gagarin.

OF THE MOON

"Will you please request the general to keep us informed on the progress of the countdown?"

"Is Pinov," came the reply. "Help?"

"*Nyet,*" said Major Winship, exhausting his Russian. "Count down. Progress. When—boom?"

"Is Pinov," came the reply.

"Boom! Boom!" said Major Winship in exasperation.

"Boom!" said Pinov happily.

"When?"

"Boom-boom!" said Pinov.

"Oh, nuts." Major Winship cut out the circuit. "They've got Pinov on emergency watch this morning," he explained to the other Ameri-

cans. "The one that doesn't speak English."

"He's done it deliberately," said Capt. Wilkins, the eldest of the four Americans. "How are we going to know when it's over?"

No one bothered to respond. They sat for a while in silence while the shadows evaporated. One by one they clicked on their cooling systems.

Ultimately, Lt. Chandler said, "This is a little ridiculous. I'm going to switch over to their channel. Rap if you want me." He sat transfixed for several minutes. "Ah, it's all Russian. Jabbering away. I can't tell a thing that's going on."

In the airless void of the moon, the blast itself would be silent. A moth's wing of dust would, perhaps, rise and settle beyond the horizon: no more.

"Static?"

"Nope."

"We'll get static on these things."

A small infinity seemed to pass very slowly.

Major Winship shifted restlessly. "My reefer's gone on the fritz." Perspiration was trickling down his face.

"Let's all go in," said the fourth American, Capt. Lawler. "It's probably over by now."

"I'll try again," Major Winship said and switched to the emergency channel. "Base Gagarin? Base Gagarin?"

"Is Pinov. Help?"

"Nyet."

"Pinov's still there," Major Winship said.

"Tell him, 'Help'," said Capt. Wilkins, "so he'll get somebody we can talk to."

"I'll see them all in hell, first," Major Winship said.

Five minutes later, the perspiration was rivers across his face. "This is it," he said. "I'm going in."

"Let's all—"

"No. I've got to cool off."

"Hell, Charlie, I feel stupid sitting out here," Capt. Lawler said. "The shot probably went off an hour ago."

"The static level hasn't gone up much, if at all."

"Maybe," Lt. Chandler said, "it's buried too deep."

"Maybe so," Major Winship said. "But we can't have the dome fall down around all our ears." He stood. "Whew! You guys stay put."

HE crossed with the floating moon-motion to the airlock and entered, closing the door behind him. The darkness slowly filled with air, and the temperature inside the suit declined steadily. At the proper moment of pressure, the inner lock slid open and Major Winship stepped into the illuminated central area. His foot was lifted for the second step when the floor beneath him rose and fell gently, pitching him forward, off balance. He stumbled against the table

and ended up seated beside the radio equipment. The ground moved again.

"Charlie! Charlie!"

"I'm okay," Major Winship answered. "Okay! Okay!"

"It's—"

There was additional surface movement. The movement ceased.

"Hey, Les, how's it look?" Capt. Wilkins asked.

"Okay from this side. Charlie, you still okay?"

"Okay," Major Winship said. "We told them this might happen," he added bitterly.

There was a wait during which everyone seemed to be holding their breath.

"I guess it's over," said Major Winship, getting to his feet. "Wait a bit more, there may be an aftershock." He switched once again to the emergency channel.

"Is Pinov," came the supremely relaxed voice. "Help?"

Major Winship whinnied in disgust. *"Nyet!"* he snarled. To the other Americans: "Our comrades seem unconcerned."

"Tough."

They began to get the static for the first time. It crackled and snapped in their speakers. They made sounds of disapproval at each other. For a minute or two, static blanked out the communications completely. It then abated to something in excess of normal.

"Well," Lt. Chandler commented, "even though we didn't build this thing to withstand a moonquake, it seems to have stood up all right."

"I guess I was just—" Major Winship began. "Oh, hell! We're losing pressure. Where's the markers?"

"By the lug cabinet."

"Got 'em," Major Winship said a moment later.

He peeled back a marker and let it fall. Air currents whisked it away and plastered it against a riveted seam of the dome. It pulsed as though it were breathing and then it ruptured.

Major Winship moved quickly to cut out the emergency air supply which had cut in automatically with the pressure drop. "You guys wait. It's on your right side, midway up. I'll try to sheet it."

He moved for the plastic sheeting.

"We've lost about three feet of calk out here," Capt. Lawler said. "I can see more ripping loose. You're losing pressure fast at this rate."

Major Winship pressed the sheeting over the leak. "How's that?"

"Not yet."

"I don't think I've got enough pressure left to hold it, now. It's sprung a little, and I can't get it to conform over the rivet heads."

There was a splatter of static.

"Damn!" Major Winship said, "they should have made these things more flexible."

"Still coming out."

"Best I can do." Major Winship stepped back. The sheet began slowly to slide downward, then it fell away completely and lay limply on the floor.

"Come on in," he said dryly.

WITH the four of them inside, it was somewhat cramped. Most of the five hundred square feet was filled with equipment. Electrical cables trailed loosely along the walls and were festooned from the ceiling, radiating from the connections to the outside solar cells. The living space was more restricted than in a submarine, with the bunks jutting out from the walls about six feet from the floor.

Lt. Chandler mounted one of the bunks to give them more room. "Well," he said wryly, "it doesn't smell as bad now."

"Oops," said Major Winship. "Just a second. They're coming in." He switched over to the emergency channel. It was General Finogenov.

"Major Winship! Hello! Hello, hello, hello. You A Okay?"

"This is Major Winship."

"Oh! Excellent, very good. Any damage, Major?"

"Little leak. You?"

"Came through without damage." General Finogenov paused a moment. When no comment was forthcoming, he continued: "Perhaps we built a bit more strongly, Major."

"You did this deliberately," Major Winship said testily.

"No, no. Oh, no, no, no, no. Major Winship, please believe me. I very much regret this. Very much so. I am very distressed. Depressed. After repeatedly assuring you there was no danger of a quake—and then to have something like this happen. Oh, this is very embarrassing to me. Is there anything at all we can do?"

"Just leave us alone, thank you," Major Winship said and cut off the communication.

"What'd they say?" Capt. Wilkins asked.

"Larry, General Finogenov said he was very embarrassed by this."

"That's nice," Lt. Chandler said.

"I'll be damned surprised," Major Winship said, "if they got any seismic data out of that shot... Well, to hell with them, let's get this leak fixed. Skip, can you get the calking compound?"

"Larry, where's the inventory?"

"Les has got it."

Lt. Chandler got down from the bunk and Capt. Wilkins mounted.

"Larry," Major Winship said, "why don't you get Earth?"

"Okay."

Capt. Wilkins got down from the bunk and Capt. Lawler ascended.

"Got the inventory sheet, Les?"

"Right here."

Squeezed in front of the massive transmitter, Capt. Wilkins had energized the circuits. There was a puzzled look on his face. He leaned his helmet against the speaker and then shook his head sadly. "We can't hear anything without any air."

Major Winship looked at the microphone. "Well, I'll just report and—" He started to pick up the microphone and reconsidered. "Yes," he said. "That's right, isn't it."

Capt. Wilkins flicked off the transmitter. "Some days you don't mine at all," he said.

"Les, have you found it?"

"It's around here somewhere. Supposed to be back here."

"Well, *find* it."

Lt. Chandler began moving boxes. "I saw it—"

"Skip, help look."

Capt. Lawler got down from the bunk and Major Winship mounted. "We haven't got all day."

A few minutes later, Lt. Chandler issued the triumphant cry. "Here it is! Dozen tubes. Squeeze tubes. It's the new stuff."

Major Winship got down and Capt. Wilkins got up.

"Marker showed it over here," Major Winship said, inching over to the wall. He traced the leak with a metallic finger.

"How does this stuff work?" Capt. Lawler asked.

They huddled over the instruction sheet.

"Let's see. Squeeze the tube until the diaphragm at the nozzle ruptures. Extrude paste into seam. Allow to harden one hour before service."

Major Winship said dryly, "Never mind. I notice it hardens on contact with air."

Capt. Wilkins lay back on the bunk and stared upward. He said, "Now that makes a weird kind of sense, doesn't it?"

"How do they possibly think—?"

"Gentlemen! It doesn't make any difference," Lt. Chandler said. "Some air must already have leaked into this one. It's hard as a rock. A gorilla couldn't extrude it."

"How're the other ones?" asked Major Winship.

Lt. Chandler turned and made a quick examination. "Oh, they're all hard, too."

"Who was supposed to check?" demanded Capt. Wilkins in exasperation.

"The only way you can check is to extrude it," Lt. Chandler said, "and if it does extrude, you've ruined it."

"That's that," Major Winship said. "There's nothing for it but to yell help."

II

CAPT. Lawler and Lt. Chandler took the land car to Base Gagarin. The Soviet base was situated some ten miles toward sunset at the bottom of a natural fold in the surface. The route was moderately direct to the tip of the gently rolling ridge. At that point, the best pathway angled left and made an S-shaped descent to the basin. It was a one-way trip of approximately thirty exhausting minutes.

Major Winship, with his deficient reefer, remained behind. Capt. Wilkins stayed for company.

"I want a cigarette in the worst way," Capt. Wilkins said.

"So do I, Larry. Shouldn't be more than a couple of hours. Unless something else goes wrong."

"As long as they'll loan us the calking compound," Capt. Wilkins said.

"Yeah, yeah," Major Winship said.

"Let's eat."

"You got any concentrate? I'm empty."

"I'll load you," Capt. Wilkins volunteered wearily.

It was an awkward operation that took several minutes. Capt. Wilkins cursed twice during the operation. "I'd hate to live in this thing for any period."

"I think these suits are one thing we've got over the Russians," Major Winship said. "I don't see how they can manipulate those bulky pieces of junk around."

They ate.

"Really horrible stuff."

"Nutritious."

After the meal, Major Winship said reflectively, "Now I'd like a cup of hot tea. I'm cooled off."

Capt. Wilkins raised eyebrows. "What brought this on?"

"I was just thinking... They really got it made, Larry. They've got better than three thousand square feet in the main dome and better than twelve hundred square feet in each of the two little ones. And there's only seven of them right now. That's living."

"They've been here six years longer, after all."

"Finogenov had a *clay* samovar sent up. Lemon and nutmeg, too. Real, by God, fresh lemons for the tea, the last time I was there. His own office is about ten by ten. Think of that. One hundred square feet. And a wooden desk. A *wooden* desk. And a chair. A wooden chair. Everything big and heavy. Everything. Weight, hell. Fifty pounds more or less—"

"They've got the powerplants for it."

"Do you think he did that deliberately?" Major Winship asked. "I think he's trying to force us off. I think he hoped for the quake. Gagar-

in's built to take it, I'll say that. Looks like it, anyhow. You don't suppose they planned this all along? Even if they didn't, they sure got the jump on us again, didn't they? I told you what he told me?"

"You told me," Capt. Wilkins said.

AFTER a moment, Major Winship said bitterly, "To hell with the Russian engineer."

"If you've got all that power..."

"That's the thing. That's the thing that gripes me, know what I mean? It's just insane to send up a heavy wooden desk. That's showing off. Like a little kid."

"Maybe they don't make aluminum desks."

"They've — got — aluminum. Half of everything on the whole planet is aluminum. You know they're just showing off."

"Let me wire you up," Capt. Wilkins said. "We ought to report."

"That's going to take awhile."

"It's something to do while we wait."

"I guess we ought to." Major Winship came down from the bunk and sat with his back toward the transmitter. Capt. Wilkins slewed the equipment around until the emergency jacks were accessible. He unearthed the appropriate cable and began unscrewing the exterior plate to the small transmitter-receiver set on Major Winship's back. Eventually, trailing wires, Major Winship was coupled into the network. "Okay?"

"Okay," Major Winship gestured.

They roused Earth.

"This is Major Charles Winship, Commanding Officer, Freedom 19, the American moonbase."

At this point, Major Winship observed for the first time that he was now on emergency air. He started to ask Capt. Wilkins to change his air bottle, but then he realized his communications were cut off. He reached over and rapped Capt. Wilkin's helmet.

"This is the Cape. Come in, Capt. Winship."

"Just a moment."

"Is everything all right?"

Major Winship was squirming nervously, obviously perturbed.

"A-Okay," he said. "Just a moment."

"What's wrong?" came the worried question. In the background, he heard someone say, "I think there's something wrong."

Capt. Wilkins peered intently. Major Winship contorted his face in a savage grimace.

Capt. Wilkins raised his eyebrows in alarm. They were face to face through their helmets, close together. Each face appeared monstrously large to the other.

Major Winship made a strangling motion and reached for his throat. One arm tangled a cable and jerked the speaker jack loose. Major Winship could no longer hear the alarmed expressions from the Cape. The effort was not entirely subvocal, since he emitted a little gasping cry in involuntary realism.

This, in the course of some 90 seconds, was transmitted to Earth.

Capt. Wilkins's lips were desperately forming the word "Leak?"

Air, Major Winship said silently.

Leak?

Bottle! Bottle! Bottle! It was a frog-like, unvocal expletive.

COMPREHENSION dawned. Capt. Wilkins nodded and started to turn away. Major Winship caught his arm and nodded his head toward the loose jack.

Oh.

Capt. Wilkins nodded and smiled. He reached across and plugged the speaker in again.

"...Freedom 19! Hello, Freedom 19! Come in!"

"We're here," Major Winship said.

"All right? Are you all right?"

"We're all right. A-Okay." Major Winship, mindful of the extent of his potential audience, took a deep breath. "Earlier this morning, the Soviet Union fired an underground atomic device for the *ostensible* purpose of investigating the composition of the lunar mass by means of seismic analysis of the resultant shock waves. This was done in spite of American warnings that such a disturbance might release accumulated stresses in the long undisturbed satellite, and was done in the face of vigorous American protests."

Capt. Wilkins tapped his helmet and gestured for him to swivel around. The turn was uncomfortably tight and complicated by the restraining cables. Capt. Wilkins began replacement of the air bottle.

"These protests have proved well founded," Major Winship continued. "Immediately following the detonation, Freedom 19 was called on to withstand a moderately severe shifting of the Lunar surface. No personnel were injured and there was no equipment damage."

Capt. Wilkins tapped his shoulder to indicate the new air bottle was being inserted. Another tap indicated it was seated. Major Winship flicked the appropriate chest button and nodded in appreciation.

"However," he continued, "we did experience a minor leak in the dome, which is presently being repaired."

"The Soviet Union," came the reply, "has reported the

by Kris Neville

disturbance and has tendered their official apology. You want it?"

"It can wait until later. Send it by mail for all I care. Vacuum has destroyed our organic air reconditioner. We have approximately three weeks of emergency air. However, Base Gagarin reports no damage, so that, in the event we exhaust our air, we will be able to obtain the necessary replacement."

The wait of a little better than three seconds for the response gave the conversation a tone of deliberation.

A new voice came on. "We tried to contact you earlier, Major. We will be able to deliver replacements in about ten days."

"I will forward a coded report on the occurrence," Major Winship said.

"Let us hear from you again in...about three hours. Is the leak repaired?"

"The leak has not yet been repaired. Over and out."

He nodded to Capt. Wilkins and leaned back.

Methodically, Capt. Wilkins set about disconnecting the major from the transmitter.

"Wow!" said Major Winship when he was once more in communication. "For a moment there, I thought..."

"What?" Capt. Wilkins asked with interest.

"I could see myself asking them to ask the Russians to ask Finogenov to get on the emergency channel to ask you to charge the air bottle. I never felt so...idiotic is not quite strong enough...there for a minute in my whole life. I didn't know how much emergency air was left, and I thought, my God, I'll never live this down. All the hams in the world listening, while I try to explain the situation. I could see the nickname being entered in my files: aka, The Airless Idiot. I tell you, that was rough."

III

CAPT. LAWLER and Lt. Chandler returned with the calking compound. It occupied the rear section of the land car. Lt. Chandler sat atop it. It was a fifty-five gallon drum.

The airlock to Freedom 19 was open. "What is *that?*" asked Major Winship, squinting out into the glaring sunlight.

"That," said Capt. Lawler, "is the calking compound."

"You're kidding," said Capt. Wilkins.

"I am not kidding."

Capt. Lawler and Lt. Chandler came inside. Capt. Wilkins mounted a bunk.

"Why didn't you just borrow a cupful?" Major Winship said sarcastically.

"It's this way," Lt. Chandler said. "They didn't have anything but 55-gallon drums of it."

"Oh, my," said Capt. Wilkins. "I suppose it's a steel

drum. Those things must weigh..."

"Actually, I think you guys have got the general wrong," Capt. Lawler said. "He was out, himself, to greet us. I think he was really quite upset by the quake. Probably because his people had misfigured so bad."

"He's too damned suspicious," Major Winship said. "You know and I know why they set that blast off. I tried to tell him. Hell. He looks at me like an emasculated owl and wants to know our ulterior motive in trying to prevent a purely scientific experiment, the results of which will be published in the technical press for the good of everybody. I'll bet!"

"About this drum," Capt. Wilkins said.

"Well, like I said, it's this way," Lt. Chandler resumed. "I told him we needed about a pint. Maybe a quart. But this stuff you have to mix up. He only had these drums. There's two parts to it, and you have to combine them in just the right proportion. He told me to take a little scale—"

"A little scale?" asked Capt. Wilkins, rolling his eyes at the dome.

"That's what I told him. We don't have any little scale."

"Yeah," said Captain Lawler, "and he looked at us with that mute, surprised look, like everybody, everywhere has dozens of little scales."

"Well, anyway," Lt. Chandler continued, "he told us just to mix up the whole fifty-five gallon drum. There's a little bucket of stuff that goes in, and it's measured just right. We can throw away what we don't need."

"Somehow, that sounds like him," Major Winship said.

"He had five or six of them."

"Jesus!" said Capt. Wilkins. "That must be *three thousand pounds* of calking compound. Those people are insane."

"The question is," Capt. Lawler said, "'How are we going to mix it?' It's supposed to be mixed thoroughly."

They thought over the problem for a while.

"That will be a man-sized job," Major Winship said.

"Let's see, Charlie. Maybe not too bad," said Capt. Wilkins. "If I took the compressor motor, we could make up a shaft and...let's see...if we could..."

IT took the better part of an hour to rig up the electric mixer.

Capt. Wilkins was profusely congratulated.

"Now," Major Winship said, "we can either bring the drum inside or take the mixer out there."

"We're going to have to bring the drum in," Capt. Wilkins said.

by Kris Neville

"Well," said Capt. Lawler, "that will make it nice and cozy."

It took the four of them to roll the drum inside, rocking it back and forth through the airlock. At that time, it was apparent the table was interposing itself.

Lt. Chandler tried to dismantle the table. "Damn these suits," he said.

"You've got it stuck between the bunk post."

"*I know* that."

"I don't think this is the way to do it," Major Winship said. "Let's back the drum out."

Reluctantly, they backed the drum out and deposited it. With the aid of Capt. Lawler, Lt. Chandler got the table unstuck. They passed it over to Major Winship, who handed it out to Capt. Wilkins. Captain Wilkins carried it around the drum of calking compound and set it down. It rested uneasily on the uneven surface.

"Now, let's go," said Major Winship.

Eventually, they accomplished the moving. They wedged the drum between the main air-supply tank and the transmitter. They were all perspiring. "It's not the weight, it's the mass," said Capt. Wilkins brightly.

"The hell it isn't the weight," said Lt. Chandler. "That's heavy."

"With my reefer out," said Major Winship, "I'm the one it's rough on." He shook perspiration out of his eyes. "They should figure a way to get a mop in here, or a towel, or a sponge, or something. I'll bet you've forgotten how much sweat stings in the eyes."

"It's the salt."

"Speaking of salt. I wish I had some salt tablets," Major Winship said. "I've never sweat so much since basic."

"Want to bet Finogenov hasn't got a bushel of them?"

"No!" Major Winship snapped.

WITH the drum of calking compound inside, both Capt. Lawler and Lt. Chandler retreated to the bunks. Capt. Wilkins maneuvered the mixing attachment. "I feel crowded," he said.

"Cozy's the word."

"Watch it! Watch it! You almost hit me in the face plate with that!"

"Sorry."

At length the mixer was in operation in the drum.

"Works perfectly," said Capt. Wilkins proudly.

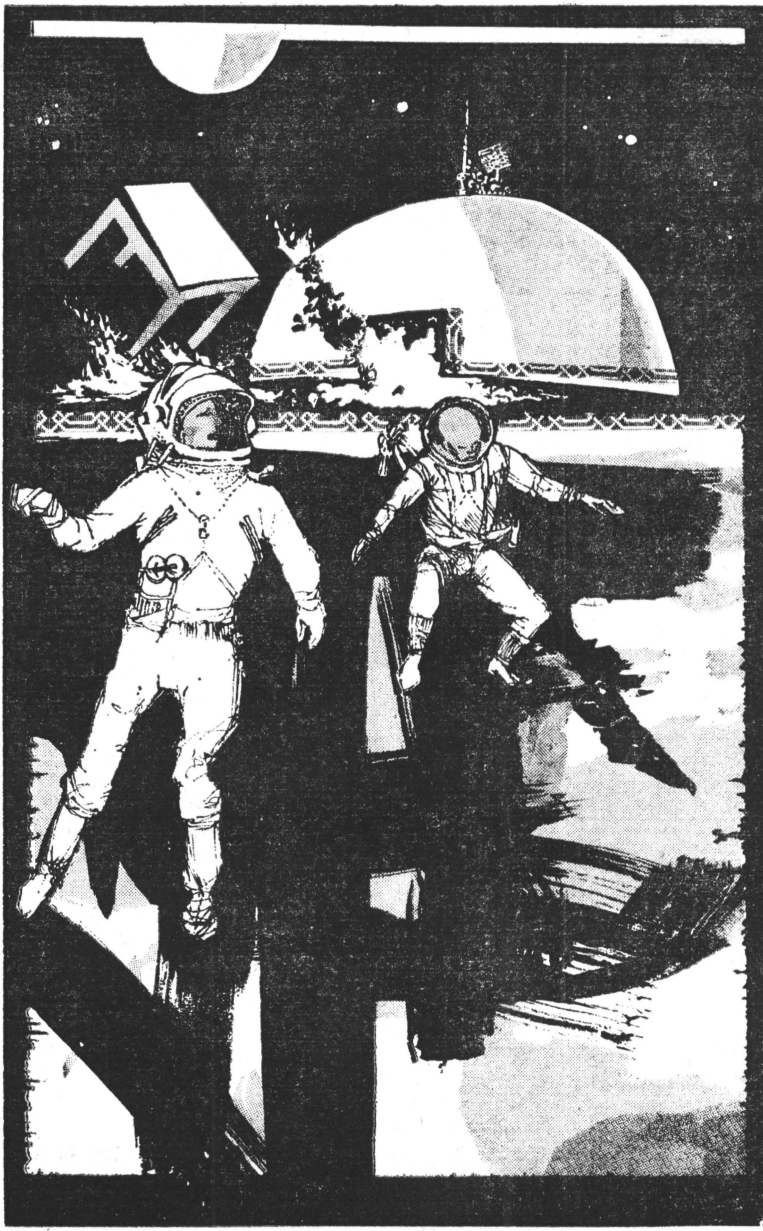
"Now what, Skip? The instructions aren't in English."

"You're supposed to dump the bucket of stuff in. Then clean the area thoroughly around the leak."

"With what?" asked Major Winship.

"Sandpaper, I guess."

"With sandpaper?" Major Winship said, emptying the bucket of fluid into the drum.



by Kris Neville

"We don't have any sandpaper."

"It's been a long day," Capt. Wilkins said.

"Mix it thoroughly," Lt. Chandler mused. "I guess that means let it mix for about ten minutes or so. Then you apply it. It sets for service in just a little bit, Finogenov said. An hour or so, maybe."

"I hope this doesn't set on exposure to air."

"No," Capt. Lawler said. "It sets by some kind of chemical action. General Finogenov wasn't sure of the English name for it. Some kind of plastic."

"Let's come back to how we're going to clean around the leak," Major Winship said.

"Say, I—" interrupted Capt. Wilkins. There was a trace of concern in his voice. "This is a hell of a time for this to occur to me. I just wasn't thinking, before. *You don't suppose it's a room-temperature-curing epoxy resin, do you?*"

"Larry," said Major Winship, "I wouldn't know a room-temperature-curing epoxy resin from—"

"Hey!" exclaimed Capt. Wilkins. "The mixer's stopped." He bent forward and touched the drum. He jerked back. "Ye Gods! that's hot! And it's harder than a rock! It *is* an epoxy! Let's get out of here."

"Huh?"

"Out! Out!"

Major Winship, Lt. Chandler, and Capt. Lawler, recognizing the sense of urgency, simultaneously glanced at the drum. It was glowing cherry red.

"Let's go!" Capt. Wilkins said.

He and the Major reached the airlock at the same time and became temporarily engaged with each other. Movement was somewhat ungainly in the space suits under the best of conditions, and now, with the necessity for speed, was doubly so. The other two crashed into them from behind, and they spewed forth from the dome in a tangle of arms and legs.

At the table, they separated, two going to the left, two to the right. The table remained untouched.

When they halted, Capt. Wilkins said, "Get to one side, it may go off like shrapnel." They obeyed.

"What — what — what?" Capt. Lawler stuttered.

They were still separated, two on one side of the airlock, two on the other.

"I'm going to try to look," Capt. Wilkins said. "Let me go." He lumbered directly away from the dome for a distance of about fifteen feet, then turned and positioned himself, some five feet behind the table, on a line of sight with the airlock.

"I can see it," he said. "It's getting redder. It's... it's... melting, yes. Melting down at

the bottom a little. Now it's falling over to one side and laying on the air tank. The air tank is getting red, too. I'm afraid...it's weakening it... Redder. Oh, oh."

"What?" said Capt. Lawler.

"Watch out! There. *There!*" Capt. Wilkins leaped from his position. He was still floating toward the ground when there was an incredibly bright flare from inside the dome, and a great, silent tongue of flame lashed through the airlock and rolled across the lunar surface. The table was sent tumbling. The flame was gone almost instantly.

"There went the air," Capt. Lawler commented.

"We got T-Trouble," said Lt. Chandler.

IV

DURING the fifteen-minute wait before they dared venture back, Capt. Wilkins, interrupted once by what appeared to be a moderately mild after-shock from the previous moonquake, explained the phenomena they had just observed.

"A room-temperature-curing epoxy liberates heat during its curing reaction. And the hotter it is when you mix it, the faster it reacts. The drum had been absorbing heat out here for several hours much faster than it could radiate it away. It may have been forty or fifty degrees C when we stirred in the curing agent. At that temperature, a pound mass will normally kick over in five or ten minutes. But here, the only way it can lose the reaction heat is by the slow process of radiation. And that means as the heat builds up, the epoxy goes faster and faster, building up even more heat. And furthermore, we're not talking about a pound, which can maybe get up to 250 C. in air. We're talking about 500 pounds, liberating five hundred times as much heat as one pound, and getting God knows how hot—"

"I sure wish you'd have told me this a little bit earlier," Major Winship said. "I certainly wish you'd told me."

Capt. Wilkins said, "Honest, it never occurred to me Finogenov would be dumb enough to tell us to mix a whole drum of epoxy."

Major Winship began to curse mechanically.

"I don't think he did it deliberately, Charlie. I really don't," Captain Lawler said. "I don't think he knew any better. Maybe he was showing off by giving us a whole drum. Hell, I know he was showing off. But something like that could kill somebody, and I don't think he'd go that far."

"Think it's safe, yet?" Major Winship asked. He was perspiring freely again. "I need some thermal protection. What'll we do? You know damned well. We'll have to go *live* with them.

And that sticks in my craw, gentlemen. That—sticks—in my—craw."

"There's nothing for it," Capt. Wilkins said helpfully.

"Let me go in and survey the damage," Lt. Chandler said.

"That's my job," Major Winship said. "I've got to go in anyway." He lumbered through the airlock and stepped into the total darkness through the razor-edge curtain.

"I see it glowing, still," he said. "It's almost as bad in here as out there, now. I guess it's okay. Come on. Let's bumble around finding the air bottles for the suits and get over there before I'm a boiled lobster. Not only is my reefer out, so's my light."

"Coming."

An air of urgency began to accumulate.

"What are we going to do with him? It's a half-hour run over there."

"Think you can make it, Charlie?"

"I'm damned well hot."

"Charlie, come out here. In the car. Skip, you get the bottles. You drive."

Major Winship came out. "Lay down in back," Capt. Wilkins said. "Les, you lay down beside him. I'll lay on top of him. I think we can shield him pretty good that way."

"That's good thinking," Capt. Lawler said from inside.

The operation was not easily executed. Lt. Chandler got in first, and then Major Winship squeezed beside him. "Careful, there," he said as Capt. Wilkins came aboard.

Capt. Wilkins's foot rolled off one of Major Winship's thighs.

"Watch it!"

"I am."

"Oops!"

"Ufff! I felt that. Ugh. Thank God for the way these are built."

"How's that?" Capt. Wilkins asked.

"I guess... It's okay, I guess."

"Cooler?"

"It's too soon to tell. Man, I'll bet we look silly."

Capt. Lawler came out with the bottles and studied his companions for a moment.

"See if we can get up and over a little more, Les."

"This okay?"

"Better. How's it feel, Charlie?"

"Okay."

Capt. Lawler deposited the air bottles. "Everyone got enough air?"

"I guess we're all okay," Capt. Wilkins said.

"Don't we look silly?" Major Winship asked plaintively. "I can't possibly describe my emotions at this minute."

"You look all right," Capt. Lawler said. "Still hot?"

Major Winship grunted. He said nothing.

"I'll get there as fast as I can."

AFTER about ten minutes jarring across the lunar surface, Major Winship said, "I'm not appreciably cooler; but then I'm not appreciably hotter, either."

"Shut up, Charlie. You're a thirty-year man," Lt. Chandler said.

"Old soldiers never die, they just become desiccated."

"I'd like a beer," Major Winship said. "A cold, frosty, foamy beer. Big collar. Gimme a beer, a little shaker of salt—"

"Finogenov's probably got eight or ten cases."

"For once, I hope you're right. Try to bounce a little easier, Larry."

"Russians don't drink beer," Lt. Chandler said.

"You sure?"

"Vodka," Capt Lawler grunted.

"They drink champagne, you idiots," Capt. Wilkins said.

"Beggars can't be choosers," Major Winship said. "Champagne is okay by me. If it's just cold."

"Finogenov will have a few hundred pounds of ice."

"Cut it out," Major Winship said.

"Boy, you wait till we get you back to Earth. When it comes time to reup, I'm going to be there. I'm going to remind you of this one."

"You're a thirty-year man, too, Les," Major Winship said.

"Not me," Lt. Chandler said. "I've had it, dad. I'm going to sell my life story to the movies and spend the rest of my life eating popcorn and watching what an idiot I was. A man can get hurt up here."

"So you want to be a civilian?"

"You're damned right I do," Lt. Chandler said.

"We're about there," Capt. Lawler cut in. "You still okay, Charlie?"

"Fine."

"Here's the little ridge, then. Hold on, we're taking the angle up. You riding okay, Charlie?"

"Fine, Skip."

After a moment, Capt. Lawler said, "I see the base now. The top. Hey!" He slammed on the brakes. "Oh, *no!* Those ...those fools! Those idiots."

"What's wrong?" Major Winship demanded. "Skip—*what's wrong?*"

"The second little dome is down. It wasn't that way a couple of hours ago. And they've block-and-tackled a drum of calking compound up on the main dome."

"We've got to stop them!" Major Winship cried. "Skip! Skip!"

"Charlie, there's nothing we can do. The drum's just starting to turn red."

There was silence for a while.

"It's melting through, now. There it goes. Down through the dome. Out of sight." After a moment, Capt. Lawler continued. "Funny how

things fall so slowly under this low gravity. It floated through their dome just like a feather. You should have seen it."

Eventually, Lt. Chandler said, "Boys, this is my last hitch."

There was more silence.

Capt. Wilkins mused, "I guess they didn't have a little scale either."

Someone was breathing loudly. At length, Major Winship said reflectively, "Why do you suppose they would try to calk it from the outside?"

Again silence. Major Winship asked the question. "Okay. Let's have it. How's the other little dome?"

"Other one? Oh, sorry," Capt. Lawler said. "It looks all right."

"It better *be* all right," Lt. Chandler said.

IN the end, the eleven of them were crowded into the one remaining operational structure of the four available on the moon at sunrise.

For perhaps the tenth time, General Finogenov offered his apologies. He and Major Winship were huddled side by side in a corner. They were drinking vodka.

"Plenty of everything," General Finogenov said. "Don't concern yourself, Major. Air, food, water, we have more than enough for a prolonged siege."

"Accidents will happen."

"Exactly," said General Finogenov, pouring more vodka for himself. "Glad you understand." He put the empty bottle down. "We will have another one next week. In the meantime— I very much regret the inconvenience. Plenty of food, water, air, though. Pinov! Pinov! Vodka!"

Pinov answered in Russian.

General Finogenov frowned. "Dear, dear," he said. "I'm afraid this must be our last one, Major. You see, while we have plenty of everything else, we are, you see... The truth of the matter is, we didn't foresee visitors. Unfortunately, we have no more vodka."

"No more vodka," said General Finogenov. He stared morosely into the inky distance. "Major Winship, I have a confession. Oh, that second one was a beauty. You didn't feel it?"

"Our leak sprang on the first one. The second was quite mild, we thought."

"We were right on the fault line," General Finogenov said. "As you Americans say, it was a beauty. I have a confession. One must admit one's mistakes."

"Yes?"

"We used much too large a bomb," he said.

"I'm with you," Lt. Chandler chimed in from somewhere out of the darkness. "But when do you think you're going to get the lights fixed?"

END

AND THEN THERE WAS PEACE

BY GORDON R. DICKSON

Peace is well worth dying for . . . it had better be!

AT nine hundred hours there were explosions off to the right at about seven hundred yards. At eleven hundred hours the slagger came by to pick up the casualties among the gadgets. Charlie saw the melting head at the end of its heavy beam going up and down like the front end of a hardworking chicken only about fifty yards west of his foxhole. Then it worked its way across the battlefield for about half an hour and, loaded down with melted forms of damaged robots, of all shapes and varieties, disappeared behind the low hill to the west, and left, of Charlie. It was a hot August day somewhere in or near Ohio, with a thunderstorm coming on. There was that yellow color in the air.

At twelve hundred hours the chow gadget came ticking over the redoubt behind the foxhole. It crawled into the foxhole, jumped up on the large table and opened itself out to reveal lunch. The menu this day was liver and onions, whole corn, whipped potato and raspberries.

"And no whip cream," said Charlie.

"You haven't been doing your exercises," said the chow gadget in a fine soprano voice.

"I'm a front-line soldier," said Charlie. "I'm an infantryman in a foxhole overlooking ground zero. I'll be damned if I take exercises."

"In any case, there is no

excuse for not shaving."

"I'll be damned if I shave."

"But why *not* shave? Wouldn't it be better than having that itchy, scratchy beard—"

"No," said Charlie. He went around back of the chow gadget and began to take its rear plate off.

"What are you doing to me?" said the chow gadget.

"You've got something stuck to you here," said Charlie. "Hold still." He surreptitiously took a second out to scratch at his four-day beard. "There's a war on, you know."

"I know that," said the chow gadget. "Of course."

"Infantrymen like me are dying daily."

"Alas," said the chow gadget, in pure, simple tones.

"To say nothing," said Charlie, setting the rear plate to one side, "of the expenditure of you technical devices. Not that there's any comparison between human lives and the wastage of machines."

"Of course not."

"So how can any of you, no matter how elaborate your computational systems, understand—" Charlie broke off to poke among the innards of the chow machine.

"DO not damage me," it said.

"Not if I can help it," said Charlie. "—understand what it feels like to a man sitting here day after day, pushing an occasional button, never knowing the results of his button pushing, and living in a sort of glass-case comfort except for the possibility that he may just suddenly be dead—suddenly, like that, before he knows it." He broke off to probe again. "It's no life for a man."

"Terrible, terrible," said the chow gadget. "But there is still hope for improvement."

"Don't hold your breath," said Charlie. "There's—ah!" He interrupted himself, pulling a small piece of paper out of the chow gadget.

"Is there something the matter?" said the chow gadget.

"No," said Charlie. He stepped over to the observation window and glanced out. The slagger was making its return. It was already within about fifty yards of the foxhole. "Not a thing," said Charlie. "As a matter of fact, the war's over."

"How interesting," said the chow gadget.

"That's right," said Charlie. "Just let me read you this little billet-doux I got from Foxhole thirty-four. *Meet you back at the bar, Charlie. It's all over. Your hunch that we could get a message across was the clear quill. Answer came today the same way, through the international weather reports. They want to quit as well as we do. Peace is agreed on, and the gadgets—*" Charlie broke off to look at the chow gadget. "That's you, along with the rest of them."

"Quite right. Of course," said the chow gadget.

"*—have already accepted the information. We'll be out of here by sundown.* And that takes care of the war."

"It does indeed," said the chow gadget. "Hurrah! And farewell."

"Farewell? said Charlie.

"You will be returning to civilian life," said the chow gadget. "I will be scrapped."

"That's right," said Charlie. "I remember the pre-programing for the big units. This war's to be the last, they were programed. Well—" said Charlie. For a moment he hesitated. "What d'you know? I may end up missing you a little bit, after all."

He glanced out the window. The slagger was almost to the dugout.

"Well, well," he said. "Now that the time's come...we did have quite a time together, three times a day. No more string beans, huh?"

"I bet not," said the chow gadget with a little laugh.

"No more caramel pudding."

"I guess so."

JUST then the slagger halted outside, broke the thick concrete roof off the dugout and laid it carefully aside.

"Excuse me," it said, its cone-shaped melting head nodding politely some fifteen feet above Charlie. "The war's over."

"I know," said Charlie.

"Now there will be peace. There are orders that all instruments of war are to be slagged and stockpiled for later peaceful uses." It had a fine baritone voice. "Excuse me," it said, "but are you finished with that chow gadget there?"

"You haven't touched a bite," said the chow gadget. "Would you like just a small spoonful of raspberries?"

"I don't think so," said Charlie, slowly. "No, I don't think so."

"Then farewell," said the chow gadget. "I am now expendable."

The melting head of the slagger dipped toward the chow gadget. Charlie opened his mouth suddenly, but before he could speak, there was a sort of invisible flare from the melting head and the chow gadget became a sort of puddle of metal which the melting head picked up magnetically and swung back to the hopper behind it.

"Blast it!" said Charlie with feeling. "I could just as well have put in a request to keep the darn thing for a souvenir."

The heavy melting head bobbed apologetically back.

"I'm afraid that wouldn't be possible," it said. "The order allows no exceptions. *All* military instruments are to be slagged and stockpiled."

"Well—" said Charlie. But it was just about then that he noticed the melting head was descending toward him. **END**

by Gordon R. Dickson

What's the principal cause of headaches? Why, having a head, of course!

THE BIG HEADACHE

BY JIM HARMON Illustrated by Dyas

I

"DO you think we'll have to use force on Macklin to get him to cooperate in the experiment?" Ferris asked eagerly.

"How are you going to go about forcing him, Doctor?" Mitchell inquired. "He outweighs you by fifty pounds and you needn't look to *me* for help against that repatriated fullback."

Ferris fingered the collar of his starched lab smock. "Guess I got carried away for a moment. But Macklin is exactly what we need for a quick, dramatic test. We've had it if he turns us down."

"I know," Mitchell said, exhaling deeply. "Somehow the men with the money just can't seem to understand basic research. Who would have financed a study of cyclic periods of the hedgehog? Yet the information gained from that study is vital in cancer research."

"When we prove our results that should be of enough practical value for anyone. But those crummy trustees didn't even leave us enough for a field test." Ferris scrubbed his thin hand over the bony ridge of his forehead. "I've been worrying so much about this I've got the ancestor of all headaches."

Mitchell's blue eyes narrowed and his boyish face took on an expression of demonic intensity. "Ferris,

would you consider—?"

"No!" the smaller man yelled. "You can't expect me to violate professional ethics and test my own discovery on myself."

"*Our* discovery," Mitchell said politely.

"That's what I meant to say. But I'm not sure it would be completely ethical with even a discovery partly mine."

"You're right. Besides who cares if you or I are cured of headaches? Our reputations don't go outside our own fields," Mitchell said. "But now Macklin—"

Elliot Macklin had inherited the reputation of the late Albert Einstein in the popular mind. He was the man people thought of when the word "mathematician" or even "scientist" was mentioned. No one knew whether his Theory of Spatium was correct or not because no one had yet been able to frame an argument with it. Macklin was in his early fifties but looked in his late thirties, with the build of a football player. The government took up a lot of his time using him as the symbol of the Ideal Scientist to help recruit Science and Engineering Cadets.

For the past seven years Macklin—who *was* the Advanced Studies Department of Firestone University—had been involved in devising a faster-than-light drive to help the Army reach Pluto and eventually the nearer stars. Mitchell had overheard two coeds talking and so knew that the project was nearing completion. If so, it was a case of *Ad astra per aspirin.*

The only thing that could delay the project was Macklin's health.

Despite his impressive body, some years before he had suffered a mild stroke...or at least a vascular spasm of a cerebral artery. It was known that he suffered from the vilest variety of migraine. A cycle of the headaches had caused him to be absent from his classes for several weeks, and there were an unusual number of military uniforms seen around the campus.

FERRIS paced off the tidy measurements of the office outside the laboratory in the biology building. Mitchell sat slumped in the chair behind the blond imitation wood desk, watching him disinterestedly.

"Do you suppose the Great Man will actually show up?" Ferris demanded, pausing in mid-stride.

"I imagine he will," Mitchell said. "Macklin's always seemed a decent enough fellow when I've had lunch with him or seen him at the trustees meetings."

"He's always treated me like dirt," Ferris said heatedly. "Everyone on this campus treats biologists like dirt. Sometimes I want to bash in their smug faces."

Sometimes, Mitchell reflected, Ferris displayed a certain lack of scientific detachment.

There came a discreet knock on the door.

"Please come in," Mitchell said.

Elliot Macklin entered in a cloud of pipe smoke and a tweed jacket. He looked more than a little like a postgraduate student, and Mitchell suspected that that was his intention.

He shook hands warmly with Mitchell. "Good of you to ask me over, Steven."

Macklin threw a big arm across Ferris' shoulders. "How have you been, Harold?"

Ferris' face flickered between pink and white. "Fine, thank you, doctor."

Macklin dropped on the edge of the desk and adjusted his pipe. "Now what's this about you wanting my help on something? And please keep the explanation simple. Biology isn't my field, you know."

Mitchell moved around the desk casually. "Actually, Doctor, we haven't the right to ask this of a man of your importance. There may be an element of risk."

The mathematician clamped onto his pipe and showed his teeth. "Now you have me intrigued. What is it all about?"

"Doctor, we understand you have severe headaches," Mitchell said.

Macklin nodded. "That's right, Steven. Migraine."

"That must be terrible," Ferris said. "All your fine reputation and lavish salary can't be much consolation when that ripping, tearing agony begins, can it?"

"No, Harold, it isn't," Macklin admitted. "What does your project have to do with my headaches?"

"Doctor," Mitchell said, "what would you say the most common complaint of man is?"

"I would have said the common cold," Macklin replied, "but I suppose from what you have said you mean headaches."

"HEADACHES," Mitchell agreed. "Everybody has them at some time in his life. Some people have them every day. Some are driven to suicide by their headaches."

"Yes," Macklin said.

"But think," Ferris interjected, "what a boon it would be if everyone could be cured of headaches *forever* by one simple injection."

"I don't suppose the manufacturers of aspirin would like you. But it would please about everybody else."

"Aspirins would still be used to reduce fever and relieve muscular pains," Mitchell said.

"I see. Are you two saying you *have* such a shot? Can you cure headaches?"

"We think we can," Ferris said.

"How can you have a specific for a number of different causes?" Macklin asked. "I know that much about the subject."

"There *are* a number of different causes for headaches—nervous strain, fatigue, physical diseases from kidney complaints to tumors, over-indulgence—but there is one *effect* of all of this, the one real cause of headaches," Mitchell announced.

"We have definitely established this for this first time," Ferris added.

"That's fine," Macklin said, sucking on his pipe. "And this effect that produces headaches is?"

"The pressure effect caused by pituitrin in the brain," Mitchell said eagerly. "That is, the constriction of blood vessels in the telencephalon section of the frontal lobes. It's caused by an over-production of the pituitary gland. We have artificially bred a virus that feeds on pituitrin."

"That may mean the end of headaches, but I would think it would mean the end of the race as well," Macklin said. "In certain areas it is valuable to have a constriction of blood vessels."

"The virus," Ferris explained, "can easily be localized and stabilized. A colony of virus in the brain cells will relax the cerebral vessels—and only the cerebral vessels—so that the cerebrospinal fluid doesn't create pressure in the cavities of the brain."

The mathematician took the pipe out of his mouth. "If this really works, I could stop using that damned gynergen, couldn't I? The stuff makes me violently sick to my stomach. But it's better than the migraine. How should I go about removing my curse?" He reinserted the pipe.

"I assure you, you can forget ergotamine tartrate," Ferris said. "Our discovery will work."

"WILL work," Macklin said thoughtfully. "The operative word. It *hasn't* worked then?"

"Certainly it has," Ferris said. "On rats, on chimps..."

"But not on humans?" Macklin asked.

"Not yet," Mitchell admitted.

"Well," Macklin said. "Well." He thumped pipe ashes out into his palm. "Certainly you can get volunteers. Convicts. Conscientious objectors from the Army."

"We want you," Ferris told him.

Macklin coughed. "I don't want to overestimate my value but the government wouldn't like it very well if I died in the middle of this project. My wife would like it even less."

Ferris turned his back on the mathematician. Mitchell could see him mouthing the word *yellow*.

"Doctor," Mitchell said quickly, "I know it's a tre-

mendous favor to ask of a man of your position. But you can understand our problem. Unless we can produce quick, conclusive and dramatic proof of our studies we can get no more financial backing. We *should* run a large-scale field test. But we haven't the time or money for that. We can cure the headaches of one person and that's the limit of our resources."

"I'm tempted," Macklin said hesitantly, "but the answer is go. I mean '*no*'. I'd like to help you out, but I'm afraid I owe too much to others to take the rest—the risk, I mean."

Macklin ran the back of his knuckles across his forehead. "I really would like to take you up on it. When I start making slips like that it means another attack of migraine. The drilling, grinding pain through my temples and around my eyeballs. The flashes of light, the rioting pools of color playing on the back of my lids. Ugh."

Ferris smiled. "Gynergen makes you sick, does it, doctor? Produces nausea, eh? The pain of that turns you almost wrong side out, doesn't it? You aren't much better off with it than without, are you? I've heard some say they preferred the migraine."

Macklin carefully arranged his pipe along with the tools he used to tend it in a worn leather case. "Tell me," he said, "what is the worst that could happen to me?"

"Low blood pressure," Ferris said.

"That's not so bad," Macklin said. "How low can it get?"

"When your heart stops, your blood pressure goes to its lowest point," Mitchell said.

A dew of perspiration had bloomed on Macklin's forehead. "Is there much risk of that?"

"Practically none," Mitchell said. "We have to give you the worst possibilities. *All* our test animals survived and seem perfectly happy and contented. As I said, the virus is self-stabilizing. Ferris and I are confident that there is no danger... But we may be wrong."

Macklin held his head in both hands. "Why did you two select *me*?"

"You're an important man, doctor," Ferris said. "Nobody would care if Mitchell or I cured ourselves of headaches—they might not even believe us if we said we did. But the proper authorities will believe a man of your reputation. Besides, neither of us has a record of chronic migraine. You do."

"Yes, I do," Macklin said. "Very well. Go ahead. Give me your injection."

Mitchell cleared his throat. "Are you positive, doctor?" he asked uncertainly. "Perhaps you would like a few days to think it over."

"No! I'm ready. Go ahead, right now."

"There's a simple release," Ferris said smoothly.

Macklin groped in his pocket for a pen.

II

"FERRIS!" Mitchell yelled, slamming the laboratory door behind him.

"Right here," the small man said briskly. He was sitting at a work table, penciling notes. "I've been expecting you."

"Doctor — Harold — you shouldn't have given this story to the newspapers," Mitchell said. He tapped the back of his hand against the folded paper.

"On the contrary, I should and I did," Ferris answered. "We wanted something dramatic to show to the trustees and here it is."

"Yes, we wanted to show our proof to the trustees— but not broadcast unverified results to the press. It's too early for that!"

"Don't be so stuffy and conservative, Mitchell! Macklin's cured, isn't he? By established periodic cycle he should be suffering hell right now, shouldn't he? But thanks to our treatment he is perfectly happy, with no unfortunate side effects such as gynergen produces."

"It's a significant test case, yes. But not enough to go to the newspapers with. If it wasn't enough to go to the press with, it wasn't enough to try and breach the trustees with. Don't you see? The public will hand down a ukase demanding our virus, just as they demanded the Salk vaccine and the Grennell serum."

"But—"

The shrill call of the telephone interrupted Mitchell's objections.

Ferris excused himself and crossed to the instrument. He answered it and listened for a moment, his face growing impatient.

"It's Macklin's wife," Ferris said. "Do you want to talk to her? I'm no good with hysterical women."

"Hysterical?" Mitchell muttered in alarm and went to the phone.

"Hello?" Mitchell said reluctantly. "Mrs. Macklin?"

"You are the other one," the clear feminine voice said. "Your name is Mitchell."

She couldn't have sounded calmer or more self-possessed, Mitchell thought.

"That's right, Mrs. Macklin. I'm Dr. Steven Mitchell, Dr. Ferris's associate."

"Do you have a license to dispense narcotics?"

"What do you mean by that, Mrs. Macklin," Mitchell said sharply.

"I used to be a nurse, Dr. Mitchell. I know you've given my husband heroin."

"That's absurd. What makes you think a thing like that?"

"The—trance he's in now."

"Now, Mrs. Macklin. Nei-

ther Dr. Ferris or myself have been near your husband for a full day. The effects of a narcotic would have worn off by this time."

"Most known narcotics," she admitted, "but evidently you have discovered something new. Is it so expensive to refine you and Ferris have to recruit new customers to keep yourselves supplied?"

"Mrs. Macklin! I think I had better talk to you later when you are calmer."

Mitchell dropped the receiver heavily. "What could be wrong with Macklin?" he asked without removing his hand from the telephone.

Ferris f r o w n e d, making quotation marks above his nose. "Let's have a look at the test animals."

Together they marched over to the cages and peered through the honeycomb pattern of the wire. The test chimp, Dean, was sitting peacefully in a corner scratching under his arms with the back of his knuckles. Jerry, their control in the experiment, who was practically Dean's twin except that he had received no injection of the E-M Virus, was stomping up and down punching his fingers through the wire, worrying the lock on the cage.

"Jerry *is* a great deal more active than Dean," Mitchell said.

"Yes, but Dean isn't sick. He just doesn't seem to have as much nervous energy to burn up. Nothing wrong with his thyroid either."

They went to the smaller cages. They found the situation with the rats, Bud and Lou, much the same.

"I don't know. Maybe they just have tired blood," Mitchell ventured.

"Iron deficiency anemia?"

"Never mind, doctor. It was a form of humor. I think we had better see exactly what is wrong with Elliot Macklin."

"There's n o t h i n g wrong with him," Ferris snapped. "He's probably just trying to get us in trouble, the ingrate!"

MACKLIN'S traditional ranch house was small but attractive in aqua-tinted aluminum.

Under Mitchell's thumb the bell chimbed *dum-de-de-dum-dum-dum.*

As they waited Mitchell glanced at Ferris. He seemed completely undisturbed, perhaps slightly curious.

The door unlatched and swung back.

"Mrs. Macklin," Mitchell said quickly, "I'm sure we can help if there is anything wrong with your husband. This is Dr. Ferris. I am Dr. Mitchell."

"You had certainly *better* help him, gentlemen." She stood out of the doorway for them to pass.

Mrs. Macklin was an attractive brunette in her late thirties. She wore an expensive yellow dress. And she had a

sharp-cornered jawline.

The Army officer came out into the hall to meet them.

"You are the gentlemen who gave Dr. Macklin the unauthorized injection," he said.

It wasn't a question.

"I don't like that 'unauthorized'," Ferris snapped.

The colonel— Mitchell spotted the eagles on his green tunic—lifted a heavy eyebrow. "No? Are you medical doctors? Are you authorized to treat illnesses?"

"We weren't treating an illness," Mitchell said. "We were discovering a method of treatment. What concern is it of yours?"

The colonel smiled thinly. "Dr. Macklin is my concern. And everything that happens to him. The Army doesn't like what you have done to him."

Mitchell wondered desperately just what they had done to the man.

"Can we see him?" Mitchell asked.

"Why not? You can't do much worse than murder him now. That might be just as well. We have laws to cover that."

The colonel led them into the comfortable, over-feminine living room. Macklin sat in an easy chair draped in embroidery, smoking. Mitchell suddenly realized Macklin used a pipe as a form of masculine protest to his home surroundings.

On the coffee table in front of Macklin were some odd-shaped building blocks such as were used in nursery schools. A second uniformed man—another colonel but with the snake-entwined staff of the medical corps in his insignia—was kneeling at the table on the marble-effect carpet.

The Army physician stood up and brushed his knees, undusted from the scrupulously clean rug.

"What's wrong with him, Sidney?" the other officer asked the doctor.

"Not a thing," Sidney said. "He's the healthiest, happiest, most well-adjusted man I've ever examined, Carson."

"But—" Colonel Carson protested.

"Oh, he's changed all right," the Army doctor answered. "He's not the same man as he used to be."

"How is he different?" Mitchell demanded.

The medic examined Mitchell and Ferris critically before answering. "He used to be a mathematical genius."

"And now?" Mitchell said impatiently.

"Now he is a moron," the medic said.

III

MITCHELL tried to stop Colonel Sidney as he went past, but the doctor mumbled he had a report to make.

Mitchell and Ferris stared at Colonel Carson and Macklin and at each other.

"What did he mean, Macklin is an idiot?" Mitchell asked.

"Not an idiot," Colonel Carson corrected primly. "Dr. Macklin is a moron. He's legally responsible, but he's extremely stupid."

"I'm not so dumb," Macklin said defensively.

"I beg your pardon, sir," Carson said. "I didn't intend any offense. But according to all the standard intelligence tests we have given you, your clinical intelligence quotient is that of a moron."

"That's just on book learning," Macklin said. "There's a lot you learn in life that you don't get out of books, son."

"I'm confident that's true, sir," Colonel Carson said. He turned to the two biologists. "Perhaps we had better speak outside."

"But—" Mitchell said, impatient to examine Macklin for himself. "Very well. Let's step into the hall."

Ferris followed them docilely.

"What have you done to him?" the colonel asked straightforwardly.

"We merely cured him of his headaches," Mitchell said.

"How?"

Mitchell did his best to explain the F-M Virus.

"You mean," the Army officer said levelly "you have infected him with some kind of a disease to rot his brain?"

"No, no! Could I talk to the other man, the doctor? Maybe I can make him understand."

"All I want to know is why Elliot Macklin has been made as simple as if he had been kicked in the head by a mule," Colonel Carson said.

"I think I can explain," Ferris interrupted.

"You can?" Mitchell said.

Ferris nodded. "We made a slight miscalculation. It appears as if the virus colony overcontrols the supply of posterior pituitary extract in the cerebrum. It isn't more than necessary to stop headaches. But that necessary amount of control to stop pain is too much to allow the brain cells to function properly."

"Why won't they function?" Carson roared.

"They don't get enough food—blood, oxygen, hemoglobin," Ferris explained. "The cerebral vessels don't contract enough to pump the blood through the brain as fast and as hard as is needed. The brain cells remain sluggish, dormant. Perhaps decaying."

The colonel yelled.

Mitchell groaned. He was abruptly sure Ferris was correct.

THE colonel drew himself to attention, fists trembling at his sides. "I'll see you hung for treason! Don't you know what Elliot Macklin means to us? Do you want those filthy Luxemburgians to reach Pluto before we do? Macklin's formula is essen-

tial to the FTL engine. You might just as well have blown up Washington, D.C. Better! The capital is replaceable. But the chances of an Elliot Macklin are very nearly once in a human race."

"Just a moment," Mitchell interrupted, "we can cure Macklin."

"You *can*?" Carson said. For a moment Mitchell thought the man was going to clasp his hands and sink to his knees.

"Certainly. We have learned to stabilize the virus colonies. We have antitoxin to combat the virus. We had always thought of it as a beneficial parasite, but we can wipe it out if necessary."

"Good!" Carson clasped his hands and gave at least slightly at the knees.

"Just you wait a second now, boys," Elliot Macklin said. He was leaning in the doorway, holding his pipe. "I've been listening to what you've been saying and I don't like it."

"What do you mean you don't like it?" Carson demanded. He added, "Sir?"

"I figure you mean to put me back like I used to be."

"Yes, doctor," Mitchell said eagerly, "just as you used to be."

"*With* my headaches, like before?"

Mitchell coughed into his fist for an instant, to give him time to frame an answer. "Unfortunately, yes. Apparently if your mind functions properly once again you will have the headaches again. Our research is a dismal failure."

"I wouldn't go that far," Ferris remarked cheerfully.

Mitchell was about to ask his associate what he meant when he saw Macklin slowly shaking his head.

"No, sir!" the mathematician said. "I shall not go back to my original state. I can remember what it was like. Always worrying, w o r r y i n g, worrying."

"You mean wondering," Mitchell said.

Macklin nodded. "Troubled, anyway. Disturbed by every little thing. How high was up, which infinity was bigger than what infinity—say, what was an infinity anyway? All that sort of schoolboy things. It's peaceful this way. My head doesn't hurt. I've got a good-looking wife and all the money I need. I've got it made. Why worry?"

Colonel Carson opened his mouth, then closed it.

"That's right, C o l o n e l. There's no use in arguing with him," Mitchell said.

"It's not his decision to make," the colonel said. "He's an idiot now."

"No, Colonel. As you said, he's a moron. He seems an idiot compared to his former level of intelligence but he's legally responsible. There are millions of morons running around loose in the United States. They can get married, own property, vote, even hold

office. Many of them do. You can't force him into being cured... At least, I don't *think* you can."

"No, I can't. This is hardly a totalitarian state." The colonel looked momentarily glum that it wasn't.

Mitchell looked back at Macklin. "Where did his wife get to, Colonel? I don't think that even previously he made too many personal decisions for himself. Perhaps she could influence him."

"Maybe," the colonel said. "Let's find her."

THEY found Mrs. Macklin in the dining room, her face at the picture window an attractive silhouette. She turned as the men approached.

"Mrs. Macklin," the colonel began, "these gentlemen believe they can cure your husband of his present condition."

"Really?" she said. "Did you speak to Elliot about that?"

"Y-yes," Colonel Carson said, "but he's not himself. He refused the treatment. He wants to remain in his state of lower intelligence."

She nodded. "If those are his wishes, I can't go against them."

"But Mrs. Macklin!" Mitchell protested. "You will have to get a court order overruling your husband's wishes."

She smoothed an eyebrow with the third finger of her right hand. "That was my original thought. But I've redecided."

"Redecided!" Carson burst out almost hysterically.

"Yes. I can't go against Elliot's wishes. It would be monstrous to put him back where he would suffer the hell of those headaches once again, where he never had a moment's peace from worry and pressure. He's happy now. Like a child, but happy."

"Mrs. Macklin," the Army man said levelly, "if you don't help us restore your husband's mind we will be forced to get a court order declaring him incompetent."

"But he is not! Legally, I mean," the woman stormed.

"Maybe not. It's a borderline case. But I think any court would give us the edge where restoring the mind of Elliot Macklin was concerned. Once he's certified incompetent, authorities can rule whether Mitchell and Ferris' antitoxin treatment is the best method of restoring Dr. Macklin to sanity."

"I doubt very much if the court would rule in that manner," she said.

The colonel looked smug. "Why not?"

"Because, Colonel, the matter of my husband's health, his very life, is involved."

"There is some degree of risk in shock treatments, too. But—"

"It isn't quite the same, Colonel. Elliot Macklin has a history of vascular spasm, a mild pseudostroke some years ago. Now you want to give

those cerebral arteries back the ability to constrict. To paralyze. To kill. No court would give you that authority."

"I suppose there's some chance of that. But without the treatment there is *no* chance of your husband regaining his right senses, Mrs. Macklin," Mitchell interjected.

Her mouth grew petulant. "I don't care. I would rather have a live husband than a dead genius. I can take care of him this way, make him comfortable..."

Carson opened his mouth and closed his fist, then relaxed. Mitchell led him back into the hall.

"I'm no psychiatrist," Mitchell said, "but I think she wants Macklin stupid. Prefers it that way. She's always dominated his personal life, and now she can dominate him completely."

"What is she? A monster?" the Army officer muttered.

"No," Mitchell said. "She's an intelligent woman unconsciously jealous of her husband's genius."

"Maybe," Carson said. "I don't know. I don't know what the hell to tell the Pentagon. I think I'll go out and get drunk."

"I'll go with you," Ferris said.

Mitchell glanced sharply at the little biologist.

Carson squinted. "Any particular reason, doctor?"

"To celebrate," Ferris said.

The colonel shrugged. "That's as good a reason as any."

On the street, Mitchell watched the two men go off together in bewilderment.

IV

MACKLIN was playing jacks.

He didn't have a head on his shoulders and he was squatting on a great curving surface that was Spacetime, and his jacks were Earth and Pluto and the rest of the planets. And for a ball he was using a head. Not his head. Mitchell's. Both heads were initialed "M" so it was all the same.

Mitchell forced himself to awaken, with some initial difficulty.

He lay there, blinking the sleep out of his eyes, listening to his heart race, and then convulsively snatched the telephone receiver from the nightstand. He stabbed out a number with a vicious index finger.

After a time there came a dull click and a sleepy answer.

"Hello?" Elliot Macklin said.

Mitchell smiled to himself. He was in luck; Macklin had answered the phone instead of his wife.

"Can you speak freely, doctor?" Mitchell asked.

"Of course," the mathematician said. "I can talk fine."

"I mean, are you alone?"

"Oh, you want to know if my wife is around. No, she's asleep. That Army doctor, Colonel Sidney, he gave her a sedative. I wouldn't let him give me anything, though."

"Good boy," the biologist said. "Listen, doctor—Elliot—El, old son. I'm not against you like all the others. I don't want to make you go back to all that worrying and thinking and headaches. You believe me, don't you?"

There was a slight hesitation.

"Sure," Macklin said, "if you say so. Why shouldn't I believe you?"

"But there was a hesitation there, El. You worried for just a second if I could have some reason for not telling you the truth."

"I suppose so," Macklin said humbly.

"You've found yourself worrying—thinking—about a lot of other problems since we left you, haven't you? Maybe not the same kind of scientific problem. But more personal ones, ones you didn't used to have time to think about."

"If you say so."

"Now, you know it's so. But how would you like to get rid of those worries just as you got rid of the others?" Mitchell asked.

"I guess I'd like that," the mathematician replied.

"Then come on over to my laboratory. You remember where it's at, don't you?"

"No, I—yes, I guess I do. But how do I know you won't try to put me back where I was instead of helping me more?"

"I couldn't do that against your wishes. That would be illegal!"

"If you say so. But I don't guess I can come anyway. The Army is watching me pretty close."

"That's alright," Mitchell said quickly. "You can bring along Colonel Carson."

"But he won't like you fixing me up more."

"But he can't stop me! Not if you want me to do it. Now listen to me—I want you to come right on over here, El."

"If you say so," Macklin said uncertainly.

MITCHELL opened the door on the first knock.

Macklin stood in the doorway, looking uncertain and ill at ease. Carson stood behind his left shoulder, looking actively belligerent.

"Come in," Mitchell said. "I have the injection ready for you, Doctor."

"Now you aren't going to 'cure' me?" Macklin said in concern. "This is just going to help ease my mind?"

"Of course," the biologist said soothingly.

Colonel Carson lunged forward, mouth opening ominously.

Mitchell winked at him broadly.

Carson stopped in confusion

and studied Mitchell's face. He essayed a second wink. Carson relaxed.

Mitchell picked up the hypo of colorless carrier fluid from the interestingly stained work table. "One thing first, Dr. Macklin. I'll have to have your signed release for this treatment. It specifies that your intelligence will probably be affected in this effort to keep your head from troubling you. Carson can witness it."

"Sure," Macklin said. "I guess that's okay. If you say so."

The colonel grinned, his face hot and shiny. "I'm sure it will be fine, Doctor."

Macklin looked at the officer with almost a trace of suspicion, then accepted the sheet of typescript and the ballpoint pen from Mitchell. Laboriously he affixed his signature.

Mitchell had the mathematician take a seat and pressed the needle directly into the neck area.

"Ouch!" Macklin said.

Mitchell stood back and exhaled.

"It should take effect shortly," the biologist said.

"Good," Carson said...

The cylinders of the electric clock said 4:35:00 A.M.

Macklin was playing with his hands and their shadows in front of his face.

"How long will this stage last, Dr. Mitchell?" Colonel Carson said in concern.

"Indefinitely. This is the last stage. The circulatory system of his brain has been relaxed to the point where he has about the I.Q. of a turnip."

Carson steeled himself. "*So*, doctor! You're nothing but a dirty Lux!"

"No, Colonel. I've never even seen Luxemburg. My reason for doing this to Dr. Macklin were entirely patriotic...or, at least, sympathetic."

"Tell that to the hangman! I'll see you tried for treason."

"Look at him, Colonel. He is certainly no longer legally responsible. He has the strength of a grown man and the intellect of an amoeba. It would be impossible to keep him alive either under sedation or in a padded cell. Even if Mrs. Macklin still refuses her consent—and I don't think she will when she sees him in this bad a state—you can go over her head and get permission for Ferris and myself to administer our antitoxin to destroy the pituitrin-absorbing virus colony in his cerebrum."

Carson looked dazed. "I—I'll call her."

MITCHELL greeted the orangish sunrise with a feeling of defeat. He turned from the window to face the instruments of his laboratory.

Mrs. Macklin had come. Numbly she signed the release allowing the restorative treatment. By the time she, Car-

son and the mathematician left, Macklin had been able to say "mama" and—embarrassingly—"p a p a" to him. Mitchell was confident he would regain his full senses and that the brain cells had only become passive, and had not decayed.

But still it was only the wiping out of one horrendous mistake. Months and months of work wasted.

The door banged open and a small man entered with a long, slender brown paper bag and proceeding on an aeronautical search pattern.

"Dr. Ferris!" Mitchell said. "You mustn't take it so hard. I tried to get in touch with you. But at least I have been able to administer the antitoxin to Dr. Macklin."

"Who gives a damn about that egghead?" Ferris said, placing the paperbag upright on the work table. "Don't you understand, man? We're rich! Where are the glasses?"

"Rich?" Mitchell said. "Doctor, would you like me to help you over to your own quarters?"

"Relax, Mitchell. I'm not *that* drunk. I know what I'm talking about. I tell you the F-M Virus is going to make us rich! Powerful! Men like Elliot Macklin will be insignificant beside us."

He knew that Ferris was in sober earnest. "What do you mean, Doctor?"

Ferris turned, his thin face lit up with a flush of pleasure. "Mitchell, we have something to make people permanently stupid! People can stop thinking temporarily by using alcohol or narcotics or watching television. But we—only you and I—have something to let them stop thinking permanently. And we'll make them pay for it—for the shot and the rent on the condition. Who *wants* to think? A handful of people. Who *has* to think to do routine paperwork or push a button or pull a lever? A bunch of happy, content morons can do all of that. We'll return man to his natural, pre-evolutionary state of stupidity. As for those of us who *don't* take the treatment, we have it made! Made!"

Mitchell stared at him.

"Don't you get it, Mitchell?" Ferris roared. *"We have the ultimate tranquilizer!"*

Mitchell thought of the world after the F-M Virus had been given it. He thought: In his condition, if I shoved Ferris so that his head cracked into the corner of the table, no one could prove anything. I could destroy our records...

No, it wasn't any good. Some other researcher somewhere else was bound to isolate the F-M Virus. None of it was any good.

He groped blindly towards the door. He had to get out, get to a drugstore, buy some aspirins.

His head was killing him.

END

The computer's answers were remarkable — especially when nobody had asked a question!

TRANSIENT

BY WILLIAM HARRIS

"MOON in 14° Pisces," said the little perforated card. Henderson stepped back from the computer and scratched his hairy head. Nonsense again. He threw the card in the wastebasket and repeated his directions on another:

"One hundred fifty cancer susceptible mice were injected in the pectoral region with 1/cc of aromatic compound A. One hundred fifty identical control mice were injected with isotonic saline, B. Eight in group A developed sarcomas at the point of injection, Group B developed none. Test the null hypothesis at 5% level of statistical significance."

The computer accepted Henderson's second offering, chewed it into acceptable code, swallowed it, and burped. Henderson watched suspiciously as red and green blinkers went on and off and a contented humming noise came from the machine's bowels. After a while the card emerged from another opening —which orifice had been thoughtfully placed at the appropriate end of the machine, anatomically speaking; thus establishing rapport between Henderson, a biologist, and nature's final product of evolution, the machine.

Henderson looked at the card: "Today you should seek solace with close friends. Give some thought to personal finances. Evening: get out and

see people. A stranger will bring news."

HENDERSON crumpled the card and tossed it in the wastebasket. He sat down, and with a little arithmetic and some formulas tested the null hypothesis all by himself. He found that his mouse experiment carried no significance whatever. Then he made a notation that someone would have to come out in the morning for his sick machine.

In the morning when the machine's doctor came to inspect it, and percuss it, and auscult it, and give it a barium enema, it behaved very well. The "doctor" left, assuring Henderson the machine merely had the hiccups. That night Henderson asked it a question about confidence limits for a universe mean, from a mean of a sample of *n* observations and got back, "Uranus on Antares but conjoining Jupiter and trining the Ascendent. Yours is a strongly literary nature."

Henderson decided to turn the machine off for a few days. It emitted an almost human sigh as it ran down and came to a halt.

He had no immediate use for it as he would be injecting mice with carcinogens in liver, spleen, marrow and kidneys to find out if they were specific. In three or four days whatever virus was affecting the machine's cerebral cortex should have run its course and the methodical Henderson could run his methodical observations into the machine, which would excrete a good methodical answer to be duly filed in the medical school library, where it would be invisible to anyone looking for it, such as freshmen medical students, and always in the way for anybody else.

Henderson surveyed his laboratory with infinite pleasure, knowing that it contained within its confines all that could be known about the universe, about men and about mice. Event Y followed event X in a purely causal manner. The successful investigator needed only to attach himself to the cycle and ride along, afterwards consulting the computer to find out if what he'd observed had any significance.

In the morning when Henderson entered the laboratory he found that someone had left the computer on overnight.

It was running full blast, which is to say the lights were blinking and the little cards of omniscience were popping out of the machine like toast and falling into the wastebasket, which is just where Henderson left them. Meanwhile, Dr. Henderson's close associate, Colonel Smith in the nearby radiation laboratory, came in to visit him and asked permission to use the computer.

And so in another week it was rumored about that the

machine in Henderson's laboratory was using a foreign dialect and answering questions about standard deviation with strange symbols which looked like crescent moons and archaic squiggles, with a little geometry on the side.

The machine was becoming impudent too. To Colonel Smith's question about the possibility of an "overkill" if such and such size bomb dropped on such and such enemy city the answer came back, "Rubbish. Aldebaran conjoining Saturn, Moon and Mars. Seek guidance from others, Hannibal blushed." The machine's doctor promptly installed a loudspeaker to help keep track of future aberrations.

THAT night the janitor walked in. He was a balding Greek gentleman, dedicated to a life with brush and dustpan. The machine was muttering darkly to itself, but when he entered the door it quieted down, contemplating its relays.

The janitor went meticulously about his business, mopping the floor, straightening chairs and secretly rearranging pipette and retorts in their racks, because he was a more meticulous person than even Dr. Henderson. As he turned to leave, the machine in the corner belched twice and then said as an afterthought:

"I am the ghost of Astrologers Sagittarian."

The janitor adjusted his hearing aid, squeezed his mop and carried his pail out the door. As he went back in to pack up his cleaning powder and brushes, the machine said, "What year is this? Limits within standard deviation, click, click, awrk!"

The janitor was a reasonable man. He walked over to the machine's microphone and told it what year it was as well as the month, day and hour. Then he carried his brushes and cleaning compound out of the room and locked the door.

But the janitor's night was a long one. At midnight, when he finished two floors and only had three more to go, he took his coffee break. As he talked with his old friend Samuel, the night watchman, he fell to thinking. That was an unforgivable mistake. After the coffee break, they both went back up to Dr. Henderson's laboratory and listened to the machine talking to itself.

"I feel like a spider," said the machine. "Nonsense. From one cobweb to another. Must settle down and build a grau ...spltvbk...within 95% confidence limits. Nova in Andromeda was bad enough. Now this. One hundred fifty cancer susceptible mice inherit the Earth."

Suddenly the machine fell silent, sensing it had visitors. The night watchman reached into the wastebasket and

pulled out one of the machine's cards.

"Aldebaran is martial in nature, in the ninth degree of Tropical Gemini," it said.

"I'M a Gemini!" exclaimed the janitor, surprised to see anything familiar come out of the machine. "Birthday is May 25."

"Wonderful!" cried the machine. "First intelligent man I've heard so far. Gemini is justly famed as the owner of a quick mind and ready wit. Your intellectual achievements are a splendid asset to your literary inclinations."

The janitor, embarrassed at the sudden praise, shifted his broom from one hand to the other. The machine continued.

"I need an Ephemeris," said the machine. "Can you find an Ephemeris? I need one desperately!" and the machine's desperate need for an Ephemeris so shook its intestines, liver and gallbladder that its tone of voice came out a minor third above the normal monotonous dirge of the loudspeaker.

"An E-what-eris?" said the janitor.

"An Ephemeris," repeated the machine. "An astronomical almanac. Something that tells me where Mars is. There I was, on my way over from the clouds of Magellan to visit friends in Orion when Whammo! Mars comes into conjunction with Uranus. When something that *big* happens I just sit down and wait. Here I am now in this absurd device. Do you suppose you could look out the window and tell me where Mars is?"

The night watchman said, "It's cloudy outside."

"See!" said the machine, "When Mars goes on the warpath *nothing* comes out right. Now, Gemini, if you will just go down to the library and get me an Ephemeris for this year we can clear this up and I'll be on my way, indebted to you for life, if not longer."

"Who shall I say it's for?" asked the janitor, who did not fully understand that the library was public, never having been in it before, and felt he needed a recommendation or a slip of approval.

"Just say it's for Pyet, the astrologer," said the machine.

"And what are you doing inside Dr. Henderson's machine?" asked the night watchman.

"I wouldn't care to be quoted on this," replied the machine, "but actually any system of communicating interrelated events with a high degree of complexity, such as the brain, or this machine, and with some number of critical processes at the quantum statistical level, can support consciousness."

The janitor and the night watchman looked blankly at each other and the machine, slightly embarrassed, added by way of explanation.

"I like to read a little

physics now and then. A harmless superstition containing many pleasant diversions.

"Before this I lived in a star, a puff of expanding gas. Before that in a haunted house ...dreadful. And before that in the lopsided blob of protoplasm that was the last of Pyet, the astrologer.

"As for Dr. Henderson's mousecatcher," chuckled the machine, "any port in a storm. Mars and Uranus you know."

The janitor was somewhat impatient with the machine. It had detained him already and probably would soon be giving him orders.

"I still have three floors to clean," said the janitor. "After that I will see if the library downstairs has a...what was it?"

"Ephemeris," said the machine. "E-P-H-E-M-E-R-I-S. Thank you."

AND so the night watchman and the janitor both said good night to the machine. Later, in the very early morning, the janitor stole back into the laboratory with a book and read some strange, strange things out loud and then stole out of the room again and locked the door behind him. Shortly after, Samuel, the night watchman, passed by.

He was surprised at an unearthly glow coming from within and a peculiar grating noise as if someone were stepping on a radio. Then the unearthly glow appeared on the fire escape and Samuel, rushing out to observe, thought the glow seemed to fly up through a hole in the low clouds where a thousand stars still blazed brightly. In its wake there was a sound like laughing.

A few hours later Dr. Henderson unlocked the door of his laboratory and pushed a cart full of mice in before him.

During the morning he dissected three hundred mice, popping out liver, spleen and kidneys as if he were shelling peas. In the afternoon he made sections of the organs, stained them with hematoxylin and eosin, mounted them on slides and looked at them under his new stereoscopic microscope. Five minutes before five, Dr. Henderson's friend, Colonel Smith, came in and watched as Henderson somewhat dubiously fed the three hundred mice, now in statistical form, into the machine. The machine whirred efficiently and shot out the answer in seconds.

"Statistically significant," said the machine.

Henderson followed his friend Colonel Smith out the door, looking neither right nor left, and locked it behind him. It had been a good day.

Behind, in the laboratory which contained within its confines all that could be known about the universe, about man, and about mice, the machine squatted in silence, the approaching darkness already enfolding it like a shroud. **END**

ONCE AROUND ARCTURUS

BY JOSEPH GREEN
Illustrated by Gaughan

I

NIKI stopped at the bank of the small stream and knelt to drink from the clear water. After the first few swallows she turned to look back, ready to flee if he should make one of the lion-like fast charges he had twice tried earlier in the chase. Instead he stopped and waited, letting her drink at leisure.

When she finished she rose to her feet, walked through the stream and resumed trotting on the other side.

"Before nightfall, my pretty one!" he called after her, and knelt to drink the cold refreshing water himself. When he lifted his head she was a hundred yards away and it was time to resume the chase.

Michael Robert Combs was tired in every bone and muscle. It seemed that he had run for years through the cool air on the mountain slopes, always a few yards behind the girl's lightly dancing feet. This odd affair had started yesterday morning at sunup, at her parent's house in the lowlands, and they had trotted without resting for over thirty hours.

When the shadows began to lengthen it was time to live up to his boast or admit defeat. Slowly, forcing his dead muscles by the sheer power of will, he stepped up the pace, extending himself second by agonizing second until he had changed from a trot to a slow run and gradually on into a racer's long-stepping stride. Ahead of him, without visible additional effort, the girl matched his pace until they were running, still the same distance apart, through the deepening shadows.

He had not drawn a full breath into his laboring lungs in an eternity. His legs were dead sticks hanging by slack tendons from lifeless hips, and his feet were mushy pillows that no longer felt the ground they trod. His stomach had shriveled and pulled tight against his ribs. He was near complete collapse and knew it. But he also knew that before he stopped he would die running, die between one step and the next, because he was the most stub-

He had given himself one Arcturan year — but the aliens allowed him less!

born man Earth had ever flung into space and defeat was unthinkable.

THE end came with dramatic suddenness. The girl stumbled and fell.

She had tripped before and gotten up and fled again, but this time her strength failed her. While he covered the hundred yards between them she collapsed.

She lay there breathing in great panting sobs, shoulders shaking, head jerking, body spasmodically twitching, leg muscles pulling and relaxing in an automatic effort to propel her one more step.

He reached her and stopped, stood there savoring the delicious knowledge that he could fall by her side and breathe, stretch out, relax and sleep. After a moment the spasms shaking the girl abated and her breathing eased. She passed immediately into deep slumber.

He knelt, turned her head gently in his hands, kissed the relaxed lips and collapsed by her side.

He paused in that timeless land lying just back of consciousness, unable to believe his senses. They were saying that the air was fresh, cool, that bright, deep yellow sunlight beat on his closed lids, that he was lying in heavy grass, wet and cold and that he had not been this hungry since his starvation-racked childhood. The sense of unreality faded as memory returned and he knew he was not in his strap in the ship.

The world around him was real.

Someone shook his shoulder vigorously and he opened his eyes. Niki was kneeling beside him, a cluster of shiny black fruit in her hand.

"Eat these very slowly, Mike. Let your stomach stretch gradually."

He was so stiff and sore it was painful to move, but his stomach clamored imperiously for attention. And the fruit was good. The reddish yellow sun of Arcturus was rising swiftly now, bringing a warmth to his chilled bones and outlining the vista before

him. The planet of *Kee'Na* had no honest mountains, but these hills approached a mile in elevation and they were near the crest. Below them, mile after mile of rolling, grassy country merged imperceptibly into the haze of distance, the whole dotted with the farmhouses and accompanying small buildings that were the homes of the Loyios. The farms were small, but the entire world, as he had seen it from a ship in the upper stratosphere, was roughly the same. The only larger buildings were the small factories scattered over the entire planet and the regular pattern of composite-function structures called centers.

"Why didn't you run away when you woke first, Niki? If you'd hidden I might never have found you, and the rules say I must return you to your father's house."

"True, Mike. But I am tired of running. You caught me fairly, and I will concede the first event and return with you willingly."

"Good. I was afraid I'd have to carry you."

Niki smiled wanly, but her understanding of Earth humor was too limited to be certain of his meaning. She was at least five nine in height and weighed close to a hundred and forty pounds. The tight-fitting one-piece suit she wore left her arms and legs bare, and they were beautifully shaped, well-muscled limbs.

HER face was beautiful. No other word could describe it. The nose was thin, the nostrils strong but delicately carved. The cheekbones were prominent and high, the sides of her face smooth and almost flat.

Her skin was a light bronze, her hair, hanging to her shoulders, a deep rich black. On Earth she would have passed for a professional athlete with a heavy tan, and could have blended in with ease.

The man who threatened to carry her was five-eleven and weighed a hundred and seventy. He was thirty-five years old, gray around the temples, and considerably less of an athlete than he had been ten years ago in the Academy. Still, he was required by regulation to keep himself fit.

They found a rock-bed stream of clear water and washed down the fruit, then set out for the nearest visible farmhouse several miles away. As the exercise eased the stiffness in his joints Mike found himself stealing glances at the tall girl walking with long, free strides by his side. He actually knew almost nothing about her, other than the obvious facts that she was beautiful, desirable, and aloof.

"How many more years do

you expect to spend in training, Niki?" he asked, hoping she would lose that cool reserve in conversation.

"Your years, about three. Our time of learning never actually ends, though, for as soon as I become a doctor I will take a pupil myself, and the process of teaching is self-educational."

"Every highly skilled person has a pupil rather than the pupils attending training meetings in groups?" He chose his words carefully, not certain of the extent of her English vocabulary.

"Your Earthly concept of mass schools is unknown here. As children we study in the home under the direction of our parents. When we are ready we are given adulting tests, and if we pass, become adults and eligible for higher training. There are always as many skilled persons as pupils so we have difficulty entering the fields we choose."

"How many Loyios are there?"

"About two hundred million. We have kept our population stable for many years."

There was a gentle humming sound and a large, rectangular box came out of the sun toward them, settling gently to the ground a few feet away. It was one of the electric flying carriers of the Loyios, a wingless, wheelless box that successfully defied gravity. Mike knew that the Loyios had succeeded in tapping their planet's magnetic field for electric power, proving their technology ahead of Earth's in that one respect, and apparently they used another application of the same principle to nullify gravity. Their only other form of transportation was trained riding animals.

The carrier door opened and Niki's younger brother Rober, a boy just approaching maturity, stepped out. He nodded to Mike with the gravity seemingly common to all his people and spoke to Niki in their own language.

"Father sent us transportation, Mike," Niki translated. "He wants us to reach home in time to rest well for another contest tomorrow."

"We need it," Mike said feelingly, and followed her on board. Rober had brought along hot food and he and Nike stuffed themselves as they flew homeward. When she could eat no more Niki curled up in her chair like a giant kitten and almost immediately fell asleep. It was a silent ride for the hour it took the slow craft to cover the miles they had ran and Mike found his mind returning to the time, four days before, when he had met her.

II

HE and several other officers had been standing outside the ship a few min-

utes after the touchdown, stretching and breathing deeply of the fresh clean air of Arcturus Four. The landing field was a half-mile from the ethnologists' station and the colonel and the two institute men who were inspecting it had walked over. Several crewmen were performing routine maintenance tasks on the hull and the rest were just watching and enjoying 9/10's G while they tried to absorb enough fresh air to last the next four months. A regular run lasted two years and they touched down only six times.

Someone mounted on a four-legged beast left the station and came swiftly toward them. As the two creatures neared the ship it became obvious the rider was a woman, and when she drew closer they saw that she was young, lovely, and scantily clad.

The other officers stared with simple admiration commingled with the intense desire of men long without women. Mike Combs looked at her and felt a hard jarring shock, a wrenching, tearing sensation of absolute need that reached deep inside his guts and anchored itself permanently. With a sense of wonder and surprise he recognized the feeling. It had come once before, and was unmistakable in its intensity. He was looking at something he honestly wanted.

A hot street corner in the Canaveral slums, a broad window, the shimmer of stainless steel appliances, people shoving by on a busy Saturday morning, and a boy in ragged clothing standing rapt, taut, eyes glued to the gray-suited form in the white-and-blue poster. Under the rugged, handsome figure a caption read: BE A SPACE CADET! *That was enough. The story was too well known to need elaboration.*

The small slum kid who was Mike Combs did not make a resolution, either silent or oral. It was unnecessary. The desire had flooded through him, irresistible, deep and complete, and he had known he would be a spaceman.

The girl rode her mount directly to the group and dismounted in one smooth flowing motion. "I have a message for Captain Combs," she said pleasantly, speaking English with only a slight accent. Her voice was deep and strong, yet at the same time intensely female.

Mike stepped forward and took the extended paper. It was a requisition for medical supplies and was properly signed by the colonel.

"If you'll come with me, please?" he said, and led the way into the ship. The thought came as they stepped into the elevator that his fel-

low officers would give him hell about not sending a crewman on such a menial errand, but it would be envy speaking.

In the small dispensary he slowly gathered up the required drugs. As he handed them to her he asked, "May I inquire your name?"

"As near as it will translate, Niki."

He placed his hands on her shoulders, so calmly and naturally she had no reason to be alarmed, and said, "You and I will be married within a year, Niki." Then he drew her unresisting form into his arms and kissed her.

She was stone-still in his embrace, completely unresponsive, and only when he stepped back did he see the strong shock in her eyes.

He held the door open for her and, dazedly, she preceded him into the elevator and they were swiftly conveyed to the ground.

When the ship took off on the next leg of its long run Mike was not on board.

IN becoming a deserter Mike Combs gave up the first thing he had ever really wanted to undertake the pursuit of the second.

Captain Combs was a secretive man. He spoke not at all of his thoughts and only seldom of his actions. After spending one night in the woods, however, he decided his chances of success would be better if based on more information, and appeared next morning at the ethnologists' station.

"Where in hell have you been? Why did you desert your ship?" snapped Dr. Carnacki, the chubby doctor of humanoid sociology, when the spaceman stepped inside.

Mike grinned easily. He had known the peppery, likeable scientist since the long trip out two years ago, and knew that he possessed a scalpel-sharp tongue. "I didn't desert. I fell into a ravine and it took me this long to climb out. Upon finding my ship gone I reported to the senior Earth representative on this planet."

"Your ship had commitments which made it imperative to leave last night. As an officer you knew of those commitments. Come come, what's the real reason?"

"The fact that I'm going to marry your messenger, Niki, and take her home with me."

The doctor sat down abruptly and the anger left his face. It was replaced by a thoughtful frown. "What crazy idea is this? Where did you see her long enough to form such an attachment?"

"I met her once. That was long enough."

"Sit down," the doctor said abruptly. "I think you'd better tell me about it, and something about yourself as well." And between sips of hot coffee Mike found himself tell-

ing the chubby scientist of what he had felt on seeing Niki, and of a past known only to himself.

When he stopped the doctor leaned back, chuckling, and drank his cold coffee. "Mike, did you know you are a neurotic? You must, or you couldn't dissemble so well. Apparently those Florida slums taught you two things, though, that some people never learn. Not to want too much out of life, but fight like hell for what you do want."

"I lied, cheated and actually stole to get into the Academy. I finally made it by blackmailing a congressman who was keeping a woman in our neighborhood."

"If the applications committee had known about your two terms in juvenile rehabilitation the President couldn't have gotten you in," said Dr. Carnacki drily. "And now you're giving all that up on the chance you can persuade this girl to marry you and leave her home for Earth."

"I'm thirty-five years old, Doc. I only had two more runs before being anchored to a desk job anyway. It's compulsory for a spaceman to be a bachelor, but most guys my age are looking around for wives. I found mine."

"I doubt it. There's not a chance in a million she'd have you."

"Let me worry about that. Now tell me how they marry."

"By choice, as all truly civilized persons must. Either sex may propose. The culture is monogamous, and is worldwide. Your problem may be solved simply by walking up to the girl and asking her to be your wife."

"But you don't think so?"

"Would an intelligent person marry a total stranger? They wed for life. Infidelity is so uncommon as to be almost unheard of. They don't lead a second mental life that is constantly preoccupied with sex."

THE object of their discussion entered the room at that moment. In her hand was a sheaf of papers. She looked mildly surprised at seeing Mike there, and slightly troubled.

Mike rose, stood silently as she approached the table. He said, "Niki, I stayed behind when my friends left because I am in love with you. Will you marry me and come with me to my world?"

The girl's troubled look deepened. "On what grounds do you base your choice of me as a mate, Mr. Combs?"

Mike hesitated, groping for words, then answered, "On the fact that the sight of you, for the second time in my life, aroused an extremely strong emotional reaction in me."

"That is sufficient to propose to an alien? For life?"

"Yes. And to wed for life is my only desire."

"I think it best I discuss it

further with my parents. Would you dine with us this evening?"

"It would be my pleasure."

Dr. Carnacki rose as the girl left and began pacing the floor, obviously excited. "Mike, I'm going to help you with your insane project. Niki's father, Jakow, is our official contact with the Loyios government, what little there is of it. These people work together very closely but apparently from mutual consent, not official decree. Centralized authority is very small, but from what I have gathered Jakow is about as high in administration as they get. If he's inviting you for dinner he has something on his mind, and I'd like to know what.

"You see, Mike, we've been somewhat in the position of the monkey studying the man here, since these people are our cultural superiors and we are social, not physical, scientists. We are, by and large, the most advanced known world in the physical sciences, but without enough knowledge of ourselves to get along with each other, much less the five intelligent races we've encountered."

"This is interesting, but what has it to do with your decision to help me?"

"Simply this. These people have shown us token hospitality and been outwardly helpful, but nevertheless have actually given us damn little on themselves. From what I do know and have guessed I prepare a report that set the Institute on its ear. Those two men were here to see for themselves, and to check my sanity. The decision is that I'm still all here, and now Earth Central would like to know how they achieved such a sane society. I think the Loyios' answer to your efforts to marry Niki may be very revealing. The fact that the last head-count disclosed every tenth person on Earth to be neurotic lends this study considerable urgency."

Mike laughed and got to his feet. "It would be a dull world without a few nuts, Doc, and I have a hunch these Loyios don't lead very exciting lives." And he left for the kitchen to hunt a more substantial breakfast.

AT seven o'clock he knocked on the door of the house of Jakow.

They ate immediately after his arrival, and thanks to a long briefing by Dr. Carnacki he managed the process of food consumption creditably. The chubby sociologist had also given him an intensive indoctrination into Loyio customs, manners, habits and history. He knew that they had no psychosomatic illnesses, that insanity, which was rare, was always physically based, that the average lifespan had risen to nearly twice that of an Earthman,

and that in Carnacki's opinion they were ahead of Earth in every important science. His home planet's great technological achievements the social scientist dismissed with a contemptuous shrug, until Mike reminded him he would not be here studying the Loyios were it not for that same technology.

There were seven people at the dinner, the five members of Niki's family and another guest besides himself, who was introduced as Doctor Lasilia. Niki was serving her doctor's training with him. All the adults except Niki's mother spoke English intelligibly, but Jakow, who spoke almost as well as Niki, did most of the talking. The entire group treated their alien guest with heavy courtesy but no especial show of friendliness.

Knowing that he was a seriously introverted, withdrawn man himself Mike felt, with grim humor, that he fitted in quite well. This was no worse than the month he had spent in Ethiopia during the summer recess of his sixth year at the Academy. He had accepted an invitation from his roommate of that year and spent the recess in his home. No one there spoke international English. He found sharing their work, their play, their primitive way of life a strange and disturbing experience. He lived some high moments on a wild-dog hunt along the banks of the Blue Nile, and shot a spotted leopard out of a huge senecio tree, but he was glad when it was over and he could return to the Academy.

Jakow was a huge man, sixty-seven years old by Earth reckoning but younger in appearance than Mike. His facial expression seldom changed, and his voice, big and heavy as his body, was almost a monotone as he sought carefully for English words. It was a subdued meal and everyone seemed glad when it was over.

The two girls stayed to do the kitchen chores while the adults adjourned to another room. Once they were seated Jakow got down to business.

"Mike, Niki has informed us of your wish to combine with her and take her to your home. By our standards she is a little young for mating, but I understand such is not the case on your world. Niki has many friends of her own here, who would become suitors later, but for now she is emotionally free. Therefore her mother and I have decided that you should be given a chance to win her. Now, it is customary in our society for a suitor to be pitted against a member of the desired one's family in contests of skill or intelligence, to determine his worthiness. Are you willing to take part in such tests?"

"Of course, since that is your custom."

"Our young couples normally associate with each other for years before one asks the other's family to hold the contests, but we are making an exception in your case," the toneless voice went on. "We will arrange a series of such events for you. All adults in the family will vote on whether to accept you after observing you in the contests, and the vote will be made known to the girl. She alone, however, is the final judge. Losing in these events does not necessarily disqualify you, since the girl may accept or reject on the basis of your actions rather than the outcome. Because this is an unusual contest, and physically you are hardly a match for any male in this family, we have decided that your opponent will be Niki herself. Return in three days and the contests will begin."

III

"ARE you ready for the second event, Mike?" Jakow asked after breakfast, the morning after their chase.

"As ready as I'll ever be," answered Mike. He did feel surprisingly good after resting a day and night.

"I am happy. The second event will try your mental ability. The third and final one, I will tell you now, will require a combination of strength and intelligence."

Mike shrugged his shoulders uncaringly. Jakow gave orders to his family pertaining to the day's work, then asked the Earthman to help him saddle three mounts. The second test was to take place at the nearby center, under the direction of Dr. Lasilia.

They saddled the three mounts in silence and led Niki's into the yard. She came out of the house immediately, dressed in a tunic similar to the ones he had seen on her before but subtly different in wear and fit. She mounted her beast with graceful ease and Jakow led them toward the center.

By Earth's standards it was the most modern structure Mike had seen on *Kee'Na*, and the best equipped. These centers were combination hospital, library, laboratory and exchange center for the goods produced in the factories. They were the only semi-commercial institutions on the planet.

The majority of the instruments and tools he saw when they led him into what was obviously the hospital section were strange and alien, but competent appearing. Dr. Lasilia was waiting for them there.

"Hello Niki, Mike. Niki, you know what we do, you study with me. Mike, I put you two under little anesthesia. Use drug what frees mind. Mind more power, stronger. While you strong we make problems. Guide mind into them. All

answers recorded on machine, way I not explain your terms."

"It records thoughts, Mike, and makes them visible and audible," said Niki.

"Please take places," said Dr. Lasilia. The table toward which he gestured was an odd affair, made like a double bed but with carved hollows and angled, immovable pillows. Mike climbed gingerly into one of the hollows and lay back, the pillow holding his head up at a forty-five degree angle. Niki climbed into the other side and stretched out her long length of beautiful femininity with a sigh.

"Hold hands, please," said Dr. Lasilia briskly, and Mike felt Niki's warm hand creep into his own. He closed his fingers on it softly. A moment later Dr. Lasilia passed a resilient band of some sort around their wrists, locking them together.

Bands were placed around their foreheads, and counters of some sort over their hearts. Out of the corner of his eye Mike saw the doctor press some buttons on a control board and unseen machinery began to hum quietly. A moment later the Doctor placed a mask of a peculiar softness over his mouth and nose. There was something in the mask that stank, terribly, but he breathed it without demur.

A recorded voice that he recognized as Jakow's began speaking and he tried to listen, but a giant hand came out of nothingness and pulled him downward into nebular blackness, where he roamed, a lost soul, until a glint of light pierced the infinity and he rushed toward it, emerging on a low, rocky hill. He blinked and looked about.

He was standing on a bluff, gazing out over a small green valley. The yellow sun of Arcturus rode high overhead. At his feet, spread out over the valley floor, was an armed force. On the opposite side, in identical formation, stood another army. And he knew, irrefutably, that Niki stood on the slopes above that army, and that she too had just awakened.

The rules that would govern this strange conflict were already imprinted on his mind. The two armies were of exactly the same size, to the man. They were composed solely of foot soldiers. The rules of combat were that two enemies canceled each other out and disappeared when they met. If two men of one force, however, attacked a single member of the other force the single man alone disappeared. Any soldier who succeeded in getting through the other army's lines and attacking the commander canceled the commander and the fight was over.

The soldiers were bound by the standards normally set for humans, with one exception. Every soldier on the field,

fighters as well as officers, could hear every mental order of the commander, making maneuvering much faster.

As he stared across the wide valley he saw that the opposite army was on the march. Niki was attacking him.

He studied their formation a moment, then ordered his own army forward, compelling it to take the shape he desired as they marched. Niki was attacking in four columns eight men wide and forty men deep, with a thin but solid line at the rear, one which extended slightly on both sides of the marching soldiers. By her side she retained a personal guard of what looked to be about fifty men.

He saw the weakness in her plan of combat immediately. As his men stepped out they organized into a gigantic wedge, one four men wide at the apex, six on the second row, eight on the third and so on until his line was over a hundred men wide. He aimed the wedge directly at the center of the army.

She saw that his organization would bring more of his men in direct contact with hers, giving him more two-to-one encounters, and changed her battle plan. The four columns ground to a halt. The thin line at the rear began to thicken as more men joined it. The two ends of the line kept marching while the center stood still and absorbed more men, and in only minutes she had a fighting crescent into which his wedge would fit as neatly as a sword into its sheath.

It would have been almost certain stalemate. He changed the line swiftly, one more time, and saw her matching move, and then the marching men collided, and began disappearing in tiny puffs of air.

Around him, as his personal guard, he kept fifty-two men.

THE toy soldiers marched as directed and did their bit with ease and speed as the battle grew hotter, disappearing with a rapidity that swiftly reduced the field. Mike worked hard and fast and to gain the maximum number of victories out of the wide-open melee, and when the field was clear he had succeeded in his aim. The two final warriors stood facing each other on a clear field, hesitated, then attacked. They disappeared in the little puff of wind, and Mike would have sworn it was their sigh of relief.

He ordered his bodyguard forward, and walked behind them toward the enemy.

Her guard came out to meet them and, on a smaller scale, it was motion and counter-motion, plan and counter-plan, until the bodies met.

The smaller battle went swiftly. When it was over Mike knew that his guess had been good. She had reserved exactly fifty men for her

bodyguard, her mind running in even numbers. He had fifty-two. In the wild meeting of the main battle he had gained two men on her. When the air cleared of the guard's fight they had gone down man for man—and he still had two men standing.

He sent the two guards after her, where she stood quietly waiting.

"I concede this game, Mike," she called clearly, waved one arm at him, and disappeared.

The scene blurred and shifted before his eyes, his two loyal phantoms became wraiths of smoke, vanished, and he was being sucked down again, into the familiar blackness...and came up into a barren world.

His instructions were clear and simple. He was a God. This was a new planet. In his hand was the seed of life. He was to build a world.

And he began.

Whatever he thought of, in detail, came instantly into being. He placed topsoil, started vegetation growing, cleared land, started a weather cycle, a climate cycle, made rivers, built lakes, started the wildlife, created farms, put people on them, began animal husbandry, built cities, built a civilization.

The uncertain element was the fact that everything, once created behaved in its natural fashion and was not under his control. The water ran downhill, the trees grew, the people worked, made love and begot, the animals ate the crops and each other, the lakes overflowed the inadequate rivers and flooded the land, drowning the animals, and the hardier vegetation grew faster than its neighbors. Nothing that had been started could be destroyed. He had to create natural enemies to curb the hardy vegetation, dig deeper channels for the rivers, make what amendments he could by the creation of new elements.

He had twenty-two hours, one Kee'Na day cycle. After that his work would be judged as would Niki's. The better world determined the winner, and the doctor was the judge of what constituted a better world.

The day fled by with remarkable speed. He became completely engrossed in being a creator, and when the time was up he looked down on his world and was unable to judge it. Some of it was good, and much was not. Many things were better than Earthmen had ever seen them, and some were worse. His control of nature had not been perfect and he had killed thousands of people and animals with natural catastrophes produced by his blunders.

He had a last brief glimpse of his efforts to play God.

Then he was compelled forward into consciousness, and found he was lying on the table, his hands by his side.

IV

THE doctor was checking his heart with an electric instrument.

"Lie, Mike. You in strain," he said gently when Mike tried to rise. Niki lay quietly, breathing deeply.

"Take this, sleep" said the doctor, offering Mike a small pill. He took it and a glass of water, swallowed and lay back. He was completely exhausted. Tentatively he reached across the space between them and groped. His fingers touched Niki's bare thigh. Seconds later her hand came stealing back into his.

When he awoke he was alone. Niki was gone, and it was approaching noon. They had passed a full day and night on the table.

He struggled to his feet and stood swaying, dizzy, until his head cleared, then went in search of food. He was ravenously hungry.

He found the kitchen after a short search. The first thing he saw on entering was Niki, seated next to a bar consuming a large sandwich.

"Hello, Mike," she greeted him between bites, and spoke to the cook in her own language.

The cook, an elderly woman with a beautiful but lined face, brought him a sandwich consisting of unfamiliar ingredients but which tasted delicious.

"Who won that last contest, Niki?" he asked as soon as the worst hunger pangs had subsided.

"I did, Mike," she said, smiling. "You created far more than I in the allotted time, more of everything from people to raindrops, but you made so many mistakes and your world was so poorly balanced that father and Dr. Lasilia judged me the winner. I've seen the final impression of your world, and you can see mine if you wish."

"I'll wait until the contests are over."

"That will not be long," said a heavy, toneless voice, and Jakow was standing beside them. "We will have the final test ready in a short time. Now please go into the library while Dr. Lasilia and I prepare it."

WHEN they entered the room Jakow closed the door on them with an admonition not to come out until they were called. The area was deserted, and since they were not allowed out it was highly unlikely anyone would be allowed in, at least for the moment. Mike reached for Niki as soon as the door hid them from Jakow.

She did not resist him, which was helpful, since she was almost as strong as he. But she kept her eyes open and stared calmly into his face as he drew her lips toward his.

He stopped, arms around her shoulders, their bodies lightly touching and lips only

inches apart. He held her so, wanting to complete the embrace, wanting to ask her permission, wanting anything that would remove that cool superior look from her lovely features. His torment must have shown in his face, for suddenly her arms were around his neck, the long beautiful length of her nestled snugly against him and the full lips were warm and sweet under his own.

It seemed a wonderfully long time before she let her arms slip down and pressed gently against his chest.

She turned away to compose herself. "Let me show you some of our artwork, Mike," she said after a moment, though she still did not look at him. He followed her into an alcove and she plucked a binder from the shelves and opened it.

It was a series of colorprints, obviously copies of famous Kee'Na paintings. Each primary color, where it was used pure, glowed; the effect of several glowing colors on a single painting was hauntingly beautiful, terribly different. Mike felt his mind reel as he tried to grasp their meaning. More than anything he had yet seen the little binder brought home, forcibly, the fact that the girl by his side was an alien.

But she did not seem as strange as his Ethiopian friend, when she began trying to explain their conception of art. He listened attentively, watching the movement of the rich lips until he could stand it no longer. This time she was not so reluctant, and after the fourth kiss he gently closed the book and put it aside. The work of art in his arms was the finest the Loyios could produce. They sat side by side, arms around each other, and between caresses they spoke in a language understood by lovers on any world.

After a time Mike's breathing eased and he collected himself enough to ask if he was honestly the first man in her life.

"You are the first to want me, Mike, truly. I have friends my own age who have kissed me, but only in play."

"Did your father persuade you to hold the contests with me, or were you willing?"

"He asked, yes, but I was already willing. You frightened me at first, but I wanted to see what you were like. Now I'm not afraid."

"Don't be, ever."

"Mike, my people are not as emotional as yours. I know this not just from you but from Dr. Carnacki and the others. Do you really think you and I are compatible? Also, we probably couldn't have children."

"How do you know about children, until we try? And yes, I'm certain we're compatible. I'll devote the rest of my life to proving it."

He stopped her next words

with a kiss, and the library faded into a dim background for both of them. Fortunately Jackow tapped discreetly on the door before he opened it.

THEY were composed enough as they followed the big man to a large room in the center of the hospital, where Dr. Lasilia was waiting.

"Mike, there is a possibility you won't live through this test," said Jakow as they entered the room. "If you do not wish to place yourself in danger I suggest that you withdraw."

Mike raised his eyebrows. "Wouldn't that disqualify me?"

"Not necessarily. Remember, our custom says a woman and her family judge by the character shown in the trials, not the results alone. Many women prefer the man do nothing dangerous, since they have already decided to accept and don't want to see him injured."

"Have you already made up your mind, Niki?" Mike asked.

She looked slightly startled, and he realized he had made a social error.

"I'd—already made a tentative decision, Mike, but it isn't definite."

"Then I'll play."

Jakow nodded, and Dr. Lasilia said, "Take off footwear, both."

Mike did as instructed, then followed the doctor toward two strange objects partially hidden behind screens in the center of the room. They were enormous mollusks, with the upper shells propped open at a sharp angle. The things were so huge Mike could step into the open space between the upper and lower shells. They were placed back to back.

"Your task, Mike and Niki, will be to stand in the mouth of these shellfish and hold the jaws open until the other person concedes," began Jakow. "Once you have assumed your position and we have removed the props the creatures' muscles will exert a closing pressure of between two and three hundred pounds, which you will have to withstand. You may quit at any time simply by calling for help. The danger lies in the fact that you may be too stubborn to call when you become exhausted and will let yourself be forced down. These jaws get progressively stronger as they draw closer together, and if they force you flat they will crush you to death. There is a solution to the problem which does not depend on strength. You must find it during the first hour for it to be useful."

The doctor motioned to Mike and he stepped into the mouth of the monster that would probably swallow him within the next few hours, bent his head and secured a solid grip with his shoulders on the upper shell. He braced his feet firmly, sliding them around until his footing was

secure, then said, "Ready."

Dr. Lasilia placed a hand on the two wooden supports, Mike heaved strongly, the upper shell rose slightly, and the doctor removed the props. The shell settled on Mike's shoulders with a leaden and implacable weight.

V

OUT of the corner of his eye he saw Dr. Lasilia lead Niki out of sight and heard her taking her stand in the other mollusk. If her foot slipped, or she lost her nerve and tried to jump... Already he was braced and straining like a bull simply to stand erect, and the mollusk would not tire.

Dr. Lasilia came back into sight, picked up a book and settled himself comfortably in a chair. Jakow was leaving. "Mike, don't be fool, be killed. Call, I get you out. No woman worth hurting, dying for, Niki positive not. You in comfort, Niki?" he raised his voice to ask.

"Read your book and be quiet. Mike and I have a problem to solve," came the girl's voice from out of his sight.

The doctor chuckled and did as told. He only raised his head occasionally to glance calculatingly at both of them.

Mike eased his load to the most comfortable position possible and settled down to some hard thinking. He had two factors to work on. One, there was definitely a s o l u t i o n which did not require that he stand here under this strain. Second, he must do whatever he had to do within an hour.

It took about five minutes of mulling it over before the solution hit him, and it was so simple he felt himself a fool not to have seen it immediately.

He turned until he was looking into the gaping maw of the brainless thing that wanted to swallow him whole, moving slowly and carefully. Once he was facing the shadowy interior he put his palms against the shell above him, eased the weight from his shoulders to his hands and then slowly let his knees bend, straightening his arms as he went downward. When his arms were straight above his head he exerted his full strength and straightened his legs, forcing the shell upward over a foot.

Once he had gained that initial first foot it was only a matter of grit and endurance to walk inward into the creature's body, his feet sinking through slimy pulp to the hard shell beneath. When the upper half was almost vertical he heard the slight sound of muscles tearing in the giant body and the pressure suddenly relaxed.

He walked easily back to the outer edge, found the actual weight of the upper shell was less than fifty pounds, and prepared to stand there

until Niki herself conceded.

Niki walked around the corner.

For the first time he realized the doctor had not been in his chair for the past several minutes. Now he came into sight from behind Niki.

"You come out, Mike. You solved problem. Niki first, so won contest. That all tests, both did fine."

JAKOW met them at his door. "Dr. Carnacki sent word he wanted to talk with you as soon as you were free to join him, Mike. If you will come for dinner again tomorrow we will have a decision ready. Who won the final event?"

Niki passed into the house with a polite smile of good-by.

"She won it, hands down," Mike admitted sheepishly. "Too smart for me."

"Not according to the second test, where you did very well," Jakow returned politely, and after a few more amenities Mike left for the station.

Dr. Carnacki was sprawled at his ease, drinking homemade beer and reading a very thick book when Mike found him in his room an hour later. It was just turning dark outside, and as he relaxed into a chair Mike realized for the first time how tired he actually was.

The chubby scientist finished his paragraph, then picked up a pad and started shooting questions at Mike. He made brief notes for answers, and his questions ranged from their personal behavior toward Mike to their apparent mastery of mental imagery, a science barely touched on Earth. He would have gone on all night if Mike had not pleaded fatigue.

"All right, but we'll have to start over in the morning. Mike, your falling in love was the best thing that ever happened to this station. I've gotten more data from you... Incidentally, I've done some checking on my authority as the Earth representative here. I think I swing enough weight to get you off if they charge you with desertion."

"Thank God!" the words popped out, to be instantly regreted, and then slowly the regret went away and Mike Combs had taken another step out of his personal shell.

"I'm glad to hear it, Doc. Even a desk job in the patrol is better than anything else on Earth."

For the first time since landing on Kee'Na he went to bed with a light heart.

Next morning, after a late breakfast, he was closeted with Dr. Carnacki again, and this time managed to satisfy the sociologist's voracious curiosity. After lunch the three other members, who were nonentities to Mike, had a go at him, and if the good Doctor had missed anything they found it. Mike felt as

though he had been through another courtship test.

Before dark he had bathed, shaved and otherwise improved upon his looks as much as possible. He was ready for the decisive visit to the house of Jakow.

Up till now he had not admitted to himself the possibility of failure. His goal was clear before him and he had been plunging headlong toward it, expending all the strength that was in him, as he had done once before in his life. The first quest had been crowned with success and he had lived aimlessly now for ten long years, awaiting a new trail. When it came, fate had prepared a good one.

THERE was one big objection to the marriage which a man of more forethought might have let discourage him. When he was a feeble, infirm old man, providing he lived so long, Niki would be a beautiful young woman, just passing into early maturity. Her passions would be stronger, deeper, at a time when he was going downhill at an ever faster pace. What would such a maladjusted chronology do to a marriage? On Earth, where he expected to live, the answer was an old and familiar story.

Still darker fancies ruled his mind as the miles passed, and he was not in an optimistic mood when he tapped on their front door.

It opened immediately and Niki's younger sister, a replica of the beautiful girl in all but size, led him to the dining room, where the family was just beginning to gather.

Jakow permitted no talk of the contest at the dinner table. He kept the conversation on Earthmen, asking incisive questions about their customs, habits, social attitudes and scientific ability. His questions were not disguised digs but open, frank inquiries.

After about the first hundred queries Mike understood something he was a little late in grasping. It was not exactly an accident that the beautiful Niki had been chosen to work for the Earthmen at

their small station, or that Jakow was their official contact. The big man was an advanced sociologist, probably the Kee'Na equivalent of Carnacki. The Loyios apparently trained their administrators in the human sciences rather than politics.

This business of Man studying Loyios was indeed a two-way proposition!

When the meal was over Jakow asked the entire group to gather in what was, to earthly eyes, the family room. Niki's mother, a woman whose beauty was of the quiet, unobtrusive sort, sat by Jakow. Niki had disappeared.

"Mike, in fairness to you I think you should know that Niki was requested, by myself and a group of other sociologists, to hold these contests," Jakow began abruptly. "I am sorry to tell you your—ah—let us call it intensity—somewhat frightened her. Her first reaction to your forthright statement on the ship was to inform you she did not desire your courtship. Her second was to tell me about it. Which I am very glad she did. Our young people do not normally think of combining until after their education is complete, a matter of several more years in Niki's case. But we asked her to consent to your courtship for the purpose of studying an Earthman's reactions under unusual stimuli."

He paused, and there was a faint cloud over his face when he continued. "You are a wonderful and extraordinary race of humanoids, Mike, and we have never encountered another like you. According to all that is logical you should not have won a single contest, yet it was our judgment that you beat Niki soundly in the overall game. There are certain intangibles—facts which do not appear under a microscope or in an equation—which form a basic difference between Loyios and Earthmen. You have a drive, a will to succeed, that is terrible in its strength, and a little frightening. I think it is rooted in your high emotion level, a compensatory factor for a certain lack of logic and self-control. Nevertheless, it has brought you far.

"Honesty is ruthless, Mike, and ruthlessness is true kindness, as you will perhaps later learn. We do not think Niki feels for you that strong emotional attachment you know as love, and we consider her mating with you, a man far beneath her in cultural status, extremely unwise. We do not think she would be happy on Earth, and feel that the adjustment from our way of life to yours is too much to ask of a young girl. You have many good points, but the barbarian is too close beneath your surface. We have all voted against you, feeling that the differences in life expectancy and background far outweigh a momentary physical attraction such as Niki now admits she feels for you.

by Joseph Green

Niki is free to choose for herself, of course, but few young girls go against their family's judgment."

THERE was a bitter, brittle silence, and then Jakow said, in a voice unnaturally soft, "I am truly sorry to tell you this, Mike."

"Don't be," said Mike as he got heavily to his feet. He could not keep all the bitterness from his voice. "The experiment has been a success, hasn't it? You have reams of data on an Earthman's behavior patterns while under stress. Dr. Carnacki needs the material I'm furnishing him. No one is hurt, Niki will forget her temporary physical attraction to a barbarian, and life will go on."

He walked to the door, shoulders slumping tiredly, then turned and said, "Only one comment. You people, Loyios or Earthman, who decide things with your heads without listening to your hearts make me sick. Very sick."

He walked across the shade-porch into the bright moonlight where his mount waited, and then he discovered what a little thing resentment is, and of what small importance words are.

Niki, already in the saddle, was waiting for him. And there was a wide, happy smile on her lips. **END**

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YOU

AND NOSTRADAMUS

—CONTINUED

RESPONSE to our challenge—how good are you at predicting?—has been, as we predicted, interesting indeed.

To restate: What we are after is logical prediction based on past events and present factors, on the premise that if you observe enough factors, and understand their trend, you can extend that trend into a probable future. We asked for the overall feeling of "If this goes on—" and, as far as possible, an adherence to this form:

Such-and-such has been happening all along;
So-and-so has just occurred;
Therefore I predict that in 90 days *this* will happen:

The reason we picked 90 days was that, due to the normal lag of magazine publishing and distribution, it takes that long for your responses to come back to you in print. The ideal prediction, then, would be one which would appear on the newsstands at the same time as newspapers carrying the same story. (This is being written on May 1, just to orient you: All I'd need to do to prove how smart I am would be to write here what you, reading this, call the lead article on this morning's newspaper.)

As promised, we give you here the most interesting of the predictions received to date. Mrs. Angelo Castagna, of Thompsonville, Conn.,

sends not one, but four, and we follow each with our comments in parenthesis.

1.

"When they get the next man-powered capsule in orbit, although it may be blacked out by complete censorship, they will be met by a U.F.O. and allowed to know what solar system has us under observation. It will be under mental communication rather than spoken language."

(Even George Adamski did not visualize space ships with pedals! I'm sure Mrs. C. meant "manned" rather than "man-powered"; as for the rest, either she's right and we'll never know—because of the censors—or...well, she's wrong.)

2.

"The first public appeal will be made for people to donate parts of their bodies that are healthy to go into a bank for spare human parts similar to the eye banks that already are in use. The donors will be tattooed with a sign that they have given permission so that the part to be kept will be removed before deterioration sets in."

(Has anyone heard this appeal?)

3.

"The first actual hurricane dispersement will take effect in September that will cause the storm to be turned out to sea before it hits any of the coastal areas. The same technique will then be used in the typhoon areas of the Pacific and the tornado belt of the middle West."

(File this until Sept.)

4.

"There will be a definite exchange of understandable speech between the porpoises and the men who have been studying them, and the porpoises will come up with some of the things that men have been trying to find out about for many centuries. But the porpoises will limit their talks to only the ones who can be trusted. They will not allow themselves to become sideshow freaks."

(There's that ol' censorship again. If you're right, Mrs. C., how can we know?)

CONGRATULATIONS and thanks to Mrs. Castagna. We hope we see many more predictions. We hope, too, that they will be checkable against concurrent news. The best predictions will be printed here, the best of all will win a free subscription to IF, and will surely provide a permanent proof of our (slightly tattered, but still firm) conviction that sf people really can think ahead.

Our own predictions of two issues ago were outstanding. They were one hundred per cent wrong. END

WORLD IN A MIRROR

BY ALBERT TEICHNER

It was a backward world, all right —
in a special and very deadly manner!

GOD knows I didn't want Hacker in the preliminary delegation right from the start. I wasn't thinking, either, of the screwball ways history can go about poetically repeating itself sometimes. I just knew that an uppity, smart-alecky kid of fifty could only cause trouble.

He already had.

Rayna had been our earlier landfall on the First Interstellar Expedition. It possessed a fairly intelligent form of life, even if the Raynans were oviparous and technologically retarded. Hacker had taken over the bulldozer to clear the area around our craft, *Terra I*, and he had been repeatedly told to stay very close to it. But no, he insisted on flattening out the peat-like top of the nearest hill too. Unfortunately that hilltop was an incubation bed for Raynan fledglings. The massacre involved not only a vast number of hatching eggs but five adult females, and we had to get away pronto while thousands of paper limbs waved threateningly at the murderers from Earth.

I'm only the Science Chronicler of this expedition but Dr. Barnes is Chief Medical Officer. His protests should have mattered where mine didn't. "I'm a hundred per cent behind Johnson," he told Captain Weber. "That kid's no damned good. The three of us will go into town with these Newtaneans and, sure as I'm

standing here, Hacker will do something wrong."

Captain Weber, looking worried as usual, tried to explain. "He'll just do the chauffeuring." But he got off that tack immediately when he saw we were not following along. "Look, I know he's a pest. But this is a political matter, for the good of the Space Corps. His great-great-uncle is President of the World Council. For all I know the old man hates his guts, won't listen to a word he says, but let's not take any chances. We're going to need plenty of these expeditions. And hyper-drive craft take an awful lot out of the economy."

The upshot of the matter was that we patriotically agreed to the setup. The captain gave Hacker a good chewing-out about respecting the rights of the Newtaneans.

The kid turned out to be surprisingly amenable on that score. "They're *human!*" he said, and I could see he was very sincere about it. "I wouldn't do anything to hurt them, sir. What's more, they must be almost as smart as we are and I'm not about to commit suicide."

So the three of us got into the jeep and rolled out of *Terra I* onto Newtane's soil.

I still felt uncomfortable about Hacker, though. He had tasted blood on Rayna and the effect of that on him had been unusually bad; he had acquired a reckless attitude toward the rights of intelligent life, his own included.

AS if to prove me wrong, he drove very carefully over the special road the Newtaneans had laid out overnight from our landing area to the highway a mile or so away. The three carloads of scowling plenipotentiaries up ahead looked appealingly funny. While the Newtaneans were remarkably, even handsomely, like us (except for a certain closeness of the eyes and a reversed ordering of their fingers) their facial muscles carried different emotional convictions. On our landing ten hours before those officials had thought our smiling faces indicated angry aggressiveness and we had been equally uncertain about their intentions. But their Semanticizer had eventually made the true state of affairs clear. Evolution had determined that an upward set of Newtanean facial muscles meant a bad situation, a downward set pleasure and cordiality. The more they scowled the more we smiled and everybody was very happy about the potential flowering of transgalactic culture that we were instituting.

When we turned onto the magnificent superhighway, however, Hacker became furious. He kept trying to pull over to the right but a steady stream of scarab-shaped cars, filled with curious sightseers, kept getting in his way.

"This is crazy," he cried.

"I think they drive on the left here," Dr. Barnes tried to explain.

"That's what I mean—they're crazy!"

"They did it that way in England for centuries," I said. "It took a long time to get them to change."

"Fine, fine." Suddenly he laughed, as if pleased with his capacity for tolerance. "If it's good enough for them it's good enough for us visitors. They sure know how to build beautiful roads!"

I suppose I should have been pleased with this shift toward good humor but I wasn't. I just could not like the youngster. He had been forgivably cocky for his age before, but now something nasty had been added.

Still, he remained on his best behavior as we approached Crona, the capital city. Its golden towers gleamed in the sun and everywhere there were crowds of beautiful tan people, waving to us and happily scowling their welcome.

The lead cars stopped before a particularly elegant skyscraper that was set in the middle of vast, symmetrical gardens. We got out and were greeted by dignitaries accompanied by technicians with Semanticizing equipment. (If this equipment worked slowly, it was still faster than any we'd developed.) The men who came toward us were puzzled when we extended our hands but, once the translation came through and they understood it was an Earth custom, they copied our gesture. Only they all put out their left hands. It took a while before reasonable contact could be made.

"Interesting," said Dr. Barnes. "They all seem to be left-handed."

"I don't see what's so interesting about that," Hacker snorted through his puggish nose. "I've seen left-handed people on Earth."

"Good for you," the doctor answered drily.

Hacker looked a little annoyed but for once managed to keep quiet.

I explained to the receiving delegation how hyper-radio contact could be established with our system for information exchanges and then told them tomorrow's group from *Terra I* would be much larger. It would be in a position to set out the technical arrangements in all the necessary detail.

The dialogue crept along as translations were made, but finally an especially regal figure stepped forward and told us the rest of the proceedings would take place within the building. We followed the Newtaneans into a hall so vast that we still seemed to be outdoors. Subtle colors were playing free-form patterns on the walls and the synesthetic reaction was that of hearing a music too beautiful, too perfect, for the relative crudity

of the human ear to grasp alone. "This," Hacker laughed, "is my idea of heaven!"

I wasn't about to unbend and openly agree with him on anything. But celestial it really was. And then the subtly rich smells of the food began to play on our nostrils. It was brought out on great automatic servers and robot arms set heaping, steaming plates before the fifty Newtaneans. We, of course, had to refuse, taking out our compacted rations and setting them before us.

All the Newtaneans were still meat-eaters. The main course was a small fowl, thoroughly browned in gravy. For me the most interesting thing about it was that four drumstick legs stuck out of each torso rather than the regulation two found on all earth-based birds. For Hacker, though, a more practical matter was involved.

"I'd sure like to try a helping of that bird," he said.

The two of us, naturally, were shocked. "That must have been a living creature once," said Barnes.

"So what?"

"Well, our civilization is essentially vegetarian. They just haven't reached our level as yet in that respect."

"Nuts loaf to you!" Hacker snapped. "And synthetic yeast pie too! I've eaten flesh."

That *really* upset me. I know there's still a little surreptitious meat-consumption on Earth—genetics shows we must get a few throwbacks in every generation—but I'd never before met anyone who openly boasted about it. Synthetic foods meet gourmet needs better than traditional ones do anyway. (Of course, I don't mean the dull compacted stuff we get on long space hops but the food served on Terran planets themselves.) Any Earthman eating flesh back home is deliberately trying to taste the atavistic sensations of savagery.

"You know how immoral that is," I told him.

"Hacker, let's forget the moral issue," Barnes said, considering him with disgust. "Let's just be sensible. We don't know enough about Newtane yet to eat *anything*."

Hacker laughed. "Why, it smells just like our own food, only better." He picked at his vita-concentrate. "Oh, let's forget about the whole thing."

We tried to. Several dignitaries rose to their full seven feet and spoke slowly into Semanticizers, flinging their queer hands out for emphasis with their thumbs waving where our pinkies do. Suddenly, though, Hacker got up from his seat and hurried down the long table to the place where the leading spokesman was eating. He leaned over him, speaking into the nearest translator, and I could see the Newtanean smiling broadly, as if trying to re-

fuse something, while Hacker frowned. Finally the smile faded into a friendly scowl. Nothing good could be coming out of this.

A minute later a robot arm proffered a loaded plate to Hacker and he started back to us with it. Barnes rose to stop him, but before Hacker reached us he had taken two mouthfuls of the meat.

I have never seen such sheer self-satisfied delight on a human face as after those first bites.

"You shouldn't be doing that," Barnes said when he sat down next to us again.

"You're just old fogies," Hacker grunted through a meat-stuffed mouth. "This is the best food I've ever eaten."

He somehow shoveled another load of meat between his lips.

Thirty seconds later his face twisted into a caricature of the human physiognomy, all writhing lines, as if every muscle were breaking loose from its neighbors. The last unswallowed portion of food erupted from his mouth and he fell forward into the vile mess.

He was dead.

PANDEMONIUM spread through the hall. Everywhere wildly smiling faces expressed despair at such an end for an honored guest. Barnes sprang into action, pulling the portable medical kit from his belt and immediately starting blood tests while some native doctors joined him with their emergency equipment. "Must start revitalizing immediately," he said, then stopped, ashen-faced, as he studied an analyzer tube. "Fantastic! No, it can't be!"

The Newtaneans were equally bewildered. They rushed Hacker to a nearby treatment chamber. All I could do was wait, while the Newtanean leader explained that Hacker had told him we had authorized his trying the food. There was no need to doubt his story. It was just what the kid would have done. I did my best to assure him that we knew his intentions had been honorable.

A half-hour later Barnes returned, a robot platform following with Hacker, body covered by a preservative glaze, on it.

"Nothing can be done," he said. "I've tried everything. Hacker's too thoroughly dead for anything ever to bring him back. We'll just have to take his body home for further study."

"But what killed him?" I demanded.

"A dozen or so things out of a thousand possibilities."

"You mean you don't have any idea?"

"Oh, I have *some* idea. Too many ideas in fact. Look, Johnson, chemistry's not your specialty but this is fairly elementary. All life contains protein, right?"

"Right."

"And all protein consists of amino acids. *Every* natural protein back home is built on levo—left turn—amino acids. Here it is just the opposite, the mirror image of what we know. Every amino acid is dextro—to the right!"

"But how can it be different here?"

"Johnson, they could ask the same question about us with equal justification—or, rather, equal lack of justification."

I was trying to feel my way through the confusion. "Barnes, I know a world could be made of anti-matter but—"

"No, no. Anti-matter is a reversal of changes within the atom. These atoms are the same as ours. It's the organization that is different—regular molecules with a different twist."

"But why should it have killed him then? We absorb starch and reject cellulose which is closely related. But the body just refuses to accept the cellulose. It doesn't necessarily go ahead and die."

"Starch and cellulose are both dextro, old man. This is a more fundamental difference. Maybe the body just throws off some of these compounds too. But there were some—plenty, I suspect—it couldn't throw off." He glanced toward the stiffening corpse, sympathetically.

"The poor kid couldn't leave well enough alone."

WELL, we are two universal days out from Newtane and soon we will drop from hyper-drive as we reach the orbit of Pluto. I shouldn't still be feeling as uneasy as I do. I'm sure I shouldn't. We have had five friendly, informative days with the people of a great civilization remarkably like ours, and President Hacker has radioed he understands perfectly that we were not responsible for the tragedy, nobody was. The kid, it seems, wasn't the apple of his eye anyway.

Ninety men and one corpse returning to the security of *terra firma*. I should, when all is said and done, be happy with the way most things have worked out. But I am a Chronicler and I know the peculiarly symbolic, seemingly superficial ways in which history manages to repeat itself.

It is more than three centuries since the last war on Earth between rightists and leftists. That was a matter of differing concepts of economics and politics. I can't help wondering, though, whether there are not even more fundamental points of eventual conflict in the universe that we have barely discovered. If there are, I'm beginning to suspect they'll still have something to do with the unfathomable difference between Right and Left, a difference that took many lives centuries ago—and may not be through with us yet. END

JUST WESTING

BY THEODORE STURGEON

BENT on a midnight raid, we flung open the door of our refrigerator the other night. We found ourselves, in the sudden glare of light from the open door, face to face with a large rabbit.

"What," we demanded, "are you doing in the refrigerator?"

"This is a Westinghouse, isn't it?" asked the rabbit.

"Yes—"

"Well," said the rabbit, "I'm just westing."

Having discharged this anecdote, without which we are incapable of discussing Westinghouse, we may proceed.

When George Westinghouse opened his first enterprise in Garrison Alley, Pittsburgh, two hundred employees worked in 20,000 square feet of space to manufacture 13 products—motors, switches, generators and the like. Now that 75 years have passed, over a hundred thousand people work for the company in 63 major manufacturing plants, 39 manufacturing and repair plants and 142 sales offices, making 300,000 variations of around 800 basic products. Among these many activities, one has been, as any perceptive reader of these pages can attest, to feed your Feature Department much fascinating material in science and technology. The very least we can do in recognition of Westinghouse's 75th anniversary is to have a look at it and its works. (Other young strong enterprises please copy.)

Each year an issue of Westinghouse's handsome house organ, the bimonthly *Westinghouse Engineer*, is given over to an annual engineering review. To find out what the company is up to in a twelvemonth, we could hardly do better than to riffle through it.

An editorial by the Vice

President in charge of engineering, Mr. J. A. Hutcheson, contains one remark of special interest to the discerning sf reader, for it would seem that for many years now we have, in a lofty and knowledgeable way, deplored the increasing compartmentation of the sciences, and the apparent lack of communication between one specialist and another, as if we educated consumers knew something the big boys did not. Well, listen at the man:

"The knowledgeable reader can...peer behind the scenes and note many changes occurring in technology itself, in the basic approaches to technical problems. For one thing, the classic distinctions between the scientist and the engineer, between research and development, are becoming hazier, and may ultimately disappear. In many advanced technology projects today, the dividing line is difficult to determine, and frequently the same scientist or engineer may be required to carry the project through all stages. This points squarely toward the need for versatility in tomorrow's scientist-engineer, if he is to cope with the technology of his day."

Hosanna!

Now let's look at a year's work at Westinghouse. Please bear in mind that we can't go into detail about all that follows; if we did we'd crowd all the stories out of this issue of *IF*, and the next one too. If any of it catches your fancy and you'd like to know more, by all means write; what we don't have on hand we can probably find out, or make the right referral for you. Also please don't fight with me if you know that one or another of the items and efforts mentioned below are not Westinghouse inventions (though a good many are.) The company does an immense amount of development work on ideas and devices from all over.

Power Generation, transmission, and distribution. Westinghouse has been up to the earlobes in nuclear energy for a long time now. This year sees operation of a new core for the reactor-generator at Shippingport, Pa. The imprived core ups the output two and a half times, and reduces the fuel cost by more than 60%. New atomic powerhouses started operation in Rowe, Mass, and Mol, Belgium (this the first commercial reactor to be exported from the U. S.) and construction went forward on new nuclear power plants in New Bedford, Pa., and in the south for the Carolinas-Virginia Co. Designs were completed for two really big ones, one at Chooz, France, and another in southern California—which, with the world's largest atomic reactor and a 360 million watt output, would be the biggest yet.

Along with power sources, the company preoccupies itself with the turbines driven by that power, the generators that make usable energy from it, and the equipment which distributes it. One of the most interesting new complexes goes into service about now in Sewaren, N. J. Impressively large (342 megawatts) it is also so highly automated it is all but spooky. Hundreds of operating variables are monitored and controlled by a computer called Prodac (a Westinghouse trademark) which has a built-in "priority director," allowing the computer to switch from one program to another depending upon the urgency of any of the thousands of decisions that the computer has to make.

We'll slide past some astonishing developments in turbines (you wouldn't think anything as simple and basic as a turbine could be improved; but they keep on doing it) and generators (two new 3600 rpm monsters which operate at 2000 lbs pressure) to a real sf heading (Trinistat Joins Mag-a-stat) which deals with a new use for Trinistor, a solid-state rectifier, coupled with a power-control; it approaches the ultimate in speed of response and veratility in generator control, separation of electrodes in arc devices and the like; Insuldur, a new insulator for power transformers which will permit utilities to carry heavier loads with the same equipment, or deliver their rated loads for a much longer time; a new test-transformer to test giant power transformers, so big it must be shipped on two oversized depressed-center flatcars and, assembled, measures 16' x 34', is 42' high and weighs 440 tons.

Here's a new tap-changer for limiting current when switching high-voltage lines, a gadget for winding heavy transformer coils six at a time (and producing a highly improved coil in the process), a new method of voltage regulation, circuit breakers which interrupt the arc between opening switchpoints with puffs of gas, and new low-voltage and telemetering systems for power distribution.

And here's a high-capacity watt-hour meter, with bearings that bear on nothing at all! Magnets built into the rotor shaft and supporting cup repel one another and suspend the whole rotor assembly in space, without friction.

Applications of Power. Automatic controls are the big thing here—"brains" which stoke blast furnaces, control to the thousandth of an inch the speeding bands of paper in its manufacture, and many other applications, and the ingenious components which make it all happen. Here's the Trinistor again, starting and

stopping a two hp motor a million and a quarter times in a test to see how long it can keep it up. (Forever, apparently. The Trinistor, a solid-state gadget, does this switching with no moving parts.) And here's some fingertip controls with which you can handle the 750-ton crane specially built to handle the new 590-ton, 150,000 kw generator rotors (13 of 'em) for the new Niagara power plant. And an incredible new hoist-motor system for swift handling of heavy loads where, at the same time, precision and safety are factors, in such jobs as ship-loading. This system makes the descending load generate electricity to help raise it, brake it and put it where you say it should go. And here's an array of new electric motor designs—smaller, stronger, cooler and simpler. One of them eliminates the field coils on the hundreds of small motors used to turn the rollers on the run-out tables in steel mills.

Control and distribution devices. So many of those transformer boxes you see on power poles near your house are of standard size, while demands keep on growing, that brains have to be cracked on the problem of putting more circuits and more capacity inside the boxes, and while making components smaller, making them better. This is being done in the development and design of new contactors, circuit breakers, insulators and controls. Some of them are designed to protect extremely delicate electronic devices from voltage surges, and for them a new system (and a new word) of *hynetic* (hydraulic magnetic) circuit breaking. The gimmick is to vary, by magnetism, the viscosity of a fluid in a hydraulic system!

Lamps and Lighting. Here are some of the most fascinating developments of all. It has long been known by engineers that the brightest and most efficient phosphors—chemicals which glow under electrical excitation—can't be used for ordinary lights because they are green. Your girl just wouldn't appreciate your gazing at her in green light. Within the past year, Westinghouse engineers have found that by a precise blending of red phosphors in the green, they can produce a new white light. In spite of the steady improvement in fluorescents in past years, this one is startling; with the same wattage it yields 15% more than the Cool White, 11% more than White, and a huge 26% more than the Daylight lamp. Best of all, these new lamps have nothing special but the new phosphors, and are directly interchangeable with the old models. Improvements have been made in mercury-vapor lamps as well.

Due to a new filament, you can get 34% more light out of a 250 watt merc than before.

Another fine lighting development is designed for what airline pilots call the "black hole"—the unlighted runway center in which they must touch down. A new centerline lamp is set into holes on the centerline one inch deep and eight inches in diameter. With lamp, lens, contacts, gaskets and fittings installed, the light projects only 1/8" above the surface, giving a bright centerline while being immune to rolling wheels, snowplows or extremes in temperature.

Roads get attention from the company's lighting engineers, too. A new "luminaire" called the OV-50, can increase street and highway lighting 50 to 90%—or maintain it at present levels at correspondingly less cost. And in another device lies a revolution in home and shop lighting—a fluorescent tube bent into a "labyrinth" so that overall, it's square, not long. A light like this can be set flush in wall or ceiling and contains its own dirtproof reflector.

Semiconductors and electronics drew so much attention for the year that we'll have to skim again. There's a new technique, the frame grid, which much improves the quality and life of the tuner and rf amplifier bottles in the front end of your TV set; because of it the image will go further yet away from the rounded rectangle to the square look. A fabulous image amplifier, the Astracon, can take in one photon of light and put out 10,000 at the other end. What this will do for the astronomy business we can only begin to guess. There's a new vidicon for weather satellites only 1/2" in diameter and a super-rugged orthicon for low-light work such as satellite tracking. Another vidicon eliminates magnetic deflection coils, making for much smaller TV cameras and extremely narrow-band transmission; it makes it possible to send visual information over conventional phone lines instead of special cable. An "ionization gauge" will measure the degree of vacuum of outer space in the range of 10^{-4} to 10^{-13} millimeters of mercury; the best up to now has been 10^{-10}.

The Trinistor we mentioned before, a solid-state rectifier which acts as a control gate for current flow, has been designed up to capacities in the order of 50 amps at 300 continuous volts and can take 1000-volt surges; you'll have to stop thinking of semi-conductors as gadgets merely for portable radios. The controlled dendritic process for "growing" amplifiers by the yard—we did an article on this for you recently—proceeds apace, and there's a new

array of thermo-electric devices useful for cooling electronic components by turning heat directly into electricity. Solid-state inverters are now in use, turning dc into ac in underwater repeaters in telephone cable. Finally, there's the Televex system, medical x-rays coupled to TV, which can better the dim old fluoroscopic screen by 50,000 times and put it on TV monitors any way you like—for a classroom, say, or a roomful of doctors in consultation.

Marine and Aviation. The company contributed to the year's most spectacular, and the year's most impressive events in these fields—the first underwater launching of Polaris, and the launching of the big flat-top *Enterprise*, which is powered by eight Westinghouse nuclear reactors. Work proceeds on nuclear propulsion for the *Long Beach*, a guided missile cruiser. And the fleet of nuclear subs, non-existent only six years ago, has been increased to 42 built or authorized.

A strictly-from-sf gadget is the dredge *Markham*, which uses a company device called Magamp—a magnetic amplifier—to control the electric drive at variable speeds and directions, while the diesel generators rotate at set rpm. Time was that only steam could do heavy dredging, because steam engines can stop without stalling. The Magamp whips this problem. Another unique feature of the ship is a transverse bow tunnel with a big reversible prop in it, making the vessel superbly maneuverable at the lowest speeds and worst cross-current conditions.

Cocktails, anyone? There's a shaker device for vibration testing which does away with mechanical linkages. A heavy magnesium plate rides on a film of oil on an optically flat granite block. The plate is driven much as is your hi-fi speaker, by armatures moving in the air-gap of electromagnets. The 22" x 32" table can handle massive loads and shake them through a half-inch travel up to 2000 times a second.

A heater for super-velocity wind-tunnels can deliver a 3400 mile-per-hour blast of air at 10,000° F. Special low-inductance capacitors (which can store up relatively small amounts of energy, release it suddenly in enormous surges) are pushing us through the beachheads of controlled fusion. Other capacitors are used for "hot shot" re-entry simulation, turning loose a flow similar to speeds from Mach 9 to Mach 24.

There's lots more. Let us close with the simple observation that if one of several companies can rack up a score like this, the capitalist system is not doing so bad after all!

END

CULTURAL EXCHANGE

It was a simple student exchange — but Retief gave them more of an education than they expected!

BY KEITH LAUMER Illustrated by R. D. Francis

I

SECOND Secretary Magnan took his green-lined cape and orange-feathered beret from the clothes tree. "I'm off now, Retief," he said. "I hope you'll manage the administrative routine during my absence without any unfortunate incidents."

"That seems a modest enough hope," Retief said. "I'll try to live up to it."

"I don't appreciate frivolity with reference to this Division," Magnan said testily. "When I first came here, the Manpower Utilization Directorate, Division of Libraries and Education was a shambles. I fancy I've made MUDDLE what it is today. Frankly, I question the wisdom of placing you in charge of such a sensitive desk, even for two weeks. But remember. Yours is purely a rubber-stamp function."

"In that case, let's leave it to Miss Furkle. I'll take a couple of weeks off myself. With her poundage, she could bring plenty of pressure to bear."

"I assume you jest, Retief," Magnan said sadly. "I should expect even you to appreciate that Bogan participation in the Exchange Program may be the first step toward sublimation of their aggressions into more cultivated channels."

"I see they're sending two thousand students to d'Land,"

Retief said, glancing at the Memo for Record. "That's a sizable sublimation."

Magnan nodded. "The Bogans have launched no less than four military campaigns in the last two decades. They're known as the Hoodlums of the Nicodemean Cluster. Now, perhaps, we shall see them breaking that precedent and entering into the cultural life of the Galaxy."

"Breaking and entering," Retief said. "You may have something there. But I'm wondering what they'll study on d'Land. That's an industrial world of the poor but honest variety."

"Academic details are the affair of the students and their professors," Magnan said. "Our function is merely to bring them together. See that you don't antagonize the Bogan representative. This will be an excellent opportunity for you to practice your diplomatic r e s t r a i n t—not your strong point, I'm sure you'll agree."

A buzzer sounded. Retief punched a button. "What is it, Miss Furkle?"

"That—bucolic person from Lovenbroy is here again." On the small desk screen, Miss Furkle's meaty features were compressed in disapproval.

"This fellow's a confounded pest. I'll leave him to you, Retief," Magnan said. "Tell him something. Get rid of him. And remember: here at Corps HQ, all eyes are upon you."

"If I'd thought of that, I'd have worn my other suit," Retief said.

Magnan snorted and passed from view. Retief punched Miss Furkle's button.

"Send the bucolic person in."

A tall broad man with bronze skin and gray hair, wearing tight trousers of heavy cloth, a loose shirt open at the neck and a short jacket, stepped into the room. He had a bundle under his arm. He paused at sight of Retief, looked him over momentarily, then advanced and held out his hand. Retief took it. For a moment the two big men stood, face to face. The newcomer's jaw muscles knotted. Then he winced.

Retief dropped his hand and motioned to a chair.

"That's nice knuckle work, mister," the stranger said, massaging his hand. "First time anybody ever did that to me. My fault though. I started it, I guess." He grinned and sat down.

"What can I do for you?" Retief said.

"You work for this Culture bunch, do you? Funny. I thought they were all ribbon-counter boys. Never mind. I'm Hank Arapoulous. I'm a farmer. What I wanted to see you about was—" He shifted in his chair. "Well, out on

Lovenbroy we've got a serious problem. The wine crop is just about ready. We start picking in another two, three months. Now I don't know if you're familiar with the Bacchus vines we grow . . . ?"

"No," Retief said. "Have a cigar?" He pushed a box across the desk. Arapoulous took one. "Bacchus vines are an unusual crop," he said, puffing the cigar alight. "Only mature every twelve years. In between, the vines don't need a lot of attention, so our time's mostly our own. We like to farm, though. Spend a lot of time developing new forms. Apples the size of a melon—and sweet—"

"Sounds very pleasant," Retief said. "Where does the Libraries and Education Division come in?"

Arapoulous leaned forward. "We go in pretty heavy for the arts. Folks can't spend all their time hybridizing plants. We've turned all the land area we've got into parks and farms. Course, we left some sizable forest areas for hunting and such. Lovenbroy's a nice place, Mr. Retief."

"It sounds like it, Mr. Arapoulous. Just what—"

"Call me Hank. We've got long seasons back home. Five of 'em. Our year's about eighteen Terry months. Cold as hell in winter; eccentric orbit, you know. Blue-black sky, stars visible all day. We do mostly painting and sculpture in the winter. Then Spring; still plenty cold. Lots of skiing, bob-sledding, ice skating; and it's the season for woodworkers. Our furniture—"

"I've seen some of your furniture," Retief said. "Beautiful work."

Arapoulous nodded. "All local timbers too. Lots of metals in our soil and those sulphates give the woods some color, I'll tell you. Then comes the Monsoon. Rain—it comes down in sheets. But the sun's getting closer. Shines all the time. Ever seen it pouring rain in the sunshine? That's the music-writing season. Then summer. Summer's hot. We stay inside in the daytime and have beach parties all night. Lots of beach on Lovenbroy; we're mostly islands. That's the drama and symphony time. The theatres are set up on the sand, or anchored offshore. You have the music and the surf and the bonfires and stars—we're close to the center of a globular cluster, you know . . ."

"You say it's time now for the wine crop?"

"That's right. Autumn's our harvest season. Most years we have just the ordinary crops. Fruit, grain, that kind of thing; getting it in doesn't take long. We spend most of the time on architecture, geting new places ready for the winter or remodeling the older ones. We spend a lot of time in our houses. We like

to have them comfortable. But this year's different. This is Wine Year."

ARAPOULOUS puffed on his cigar, looked worriedly at Retief. "Our wine crop is our big money crop," he said. "We make enough to keep us going. But this year..."

"The crop isn't panning out?"

"Oh, the crop's fine. One of the best I can remember. Course, I'm only twenty-eight; I can't remember but two other harvests. The problem's not the crop."

"Have you lost your markets? That sounds like a matter for the Commercial—"

"Lost our markets? Mister, nobody that ever tasted our wines ever settled for anything else!"

"It sounds like I've been missing something," said Retief. "I'll have to try them some time."

Arapoulous put his bundle on the desk, pulled off the wrappings. "No time like the present," he said.

Retief looked at the two squat bottles, one green, one amber, both dusty, with faded labels, and blackened corks secured by wire.

"Drinking on duty is frowned on in the Corps, Mr. Arapoulous," he said.

"This isn't *drinking*. It's just wine." Arapoulous pulled the wire retainer loose, thumbed the cork. It rose slowly, then popped in the air. Arapoulous caught it. Aromatic fumes wafted from the bottle. "Besides, my feelings would be hurt if you didn't join me." He winked.

Retief took two thin-walled glasses from a table beside the desk. "Come to think of it, we also have to be careful about violating quaint native customs."

Arapoulous filled the glasses. Retief picked one up, sniffed the deep rust-colored fluid, tasted it, then took a healthy swallow. He looked at Arapoulous thoughtfully.

"Hmmm. It tastes like salted pecans, with an undercurrent of crusted port."

"Don't try to describe it, Mr. Retief," Arapoulous said. He took a mouthful of wine, swished it around his teeth, swallowed. "It's Bacchus wine, that's all. Nothing like it in the Galaxy." He pushed the second bottle toward Retief. "The custom back home is to alternate red wine and black."

RETIEF put aside his cigar, pulled the wires loose, nudged the cork, caught it as it popped up.

"Bad luck if you miss the cork," Arapoulous said, nodding. "You probably never heard about the trouble we had on Lovenbroy a few years back?"

"Can't say that I did, Hank." Retief poured the black wine into two fresh

glasses. "Here's to the harvest."

"We've got plenty of minerals on Lovenbroy," Arapoulous said, swallowing wine. "But we don't plan to wreck the landscape mining 'em. We like to farm. About ten years back some neighbors of ours landed a force. They figured they knew better what to do with our minerals than we did. Wanted to strip-mine, smelt ore. We convinced 'em otherwise. But it took a year, and we lost a lot of men."

"That's too bad," Retief said. "I'd say this one tastes more like roast beef and popcorn over a Riesling base."

"It put us in a bad spot," Arapoulous went on. "We had to borrow money from a world called Croanie. Mortgaged our crops. Had to start exporting art work too. Plenty of buyers, but it's not the same when you're doing it for strangers."

"Say, this business-of alternating drinks is the real McCoy," Retief said. "What's the problem? Croanie about to foreclose?"

"Well, the loan's due. The wine crop would put us in the clear. But we need harvest hands. Picking Bacchus grapes isn't a job you can turn over to machinery—and anyway we wouldn't if we could. Vintage season is the high point of living on Lovenbroy. Everybody joins in. First, there's the picking in the fields. Miles and miles of vineyards covering the mountain sides, and crowding the river banks, with gardens here and there. Big vines, eight feet high, loaded with fruit, and deep grass growing between. The wine-carriers keep on the run, bringing wine to the pickers. There's prizes for the biggest day's output, bets on who can fill the most baskets in an hour... The sun's high and bright, and it's just cool enough to give you plenty of energy. Come nightfall, the tables are set up in the garden plots, and the feast is laid on: roast turkeys, beef, hams, all kinds of fowl. Big salads. Plenty of fruit. Fresh-baked bread...and wine, plenty of wine. The cooking's done by a different crew each night in each garden, and there's prizes for the best crews.

"Then the wine-making. We still tramp out the vintage. That's mostly for the young folks but anybody's welcome. That's when things start to get loosened up. Matter of fact, pretty near half our young-uns are born after a vintage. All bets are off then. It keeps a fellow on his toes though. Ever tried to hold onto a gal wearing nothing but a layer of grape juice?"

"NEVER did," Retief said. "You say most of the children are born after a vintage. That would make them only twelve years old by the time—"

"Oh, that's Lovenbroy years; they'd be eighteen, Terry reckoning."

"I was thinking you looked a little mature for twenty-eight," Retief said.

"Forty-two, Terry years," Arapoulous said. "But this year it looks bad. We've got a bumper crop—and we're short-handed. If we don't get a big vintage, Croanie steps in. Lord knows what they'll do to the land. Then next vintage time, with them holding half our grape acreage—"

"You hocked the vineyards?"

"Yep. Pretty dumb, huh? But we figured twelve years was a long time."

"On the whole," Retief said, "I think I prefer the black. But the red is hard to beat..."

"What we figured was, maybe you Culture boys could help us out. A loan to see us through the vintage, enough to hire extra hands. Then we'd repay it in sculpture, painting, furniture—"

"Sorry, Hank. All we do here is work out itineraries for traveling side-shows, that kind of thing. Now, if you needed a troop of Groaci nose-flute players—"

"Can they pick grapes?"

"Nope. Anyway, they can't stand the daylight. Have you talked this over with the Labor Office?"

"Sure did. They said they'd fix us up with all the electronics specialists and computer programmers we wanted—but no field hands. Said it was what they classified as menial drudgery; you'd have thought I was trying to buy slaves."

The buzzer sounded. Miss Furkle's features appeared on the desk screen.

"You're due at the Intergroup Council in five minutes," she said. "Then afterwards, there are the Bogan students to meet."

"Thanks." Retief finished his glass, stood. "I have to run, Hank," he said. "Let me think this over. Maybe I can come up with something. Check with me day after tomorrow. And you'd better leave the bottles here. Cultural exhibits, you know."

II

AS the council meeting broke up, Retief caught the eye of a colleague across the table.

"Mr. Whaffle, you mentioned a shipment going to a place called Croanie. What are they getting?"

Whaffle blinked. "You're the fellow who's filling in for Magnan, over at MUDDLE," he said. "Properly speaking, equipment grants are the sole concern of the Motorized Equipment Depot, Division of Loans and Exchanges." He pursed his lips. "However, I suppose there's no harm in telling you. They'll be receiving heavy mining equipment."

"Drill rigs, that sort of thing?"

"Strip mining gear." Whaffle took a slip of paper from a breast pocket, blinked at it. "Bolo Model WV/1 tractors, to be specific. Why is MUDDLE interested in MEDDLE's activities?"

"Forgive my curiosity, Mr. Whaffle. It's just that Croanie cropped up earlier today. It seems she holds a mortgage on some vineyards over on—"

"That's not MEDDLE's affair, sir," Whaffle cut in. "I have sufficient problems as Chief of MEDDLE without probing into MUDDLE's business."

"Speaking of tractors," another man put in, "we over at the Special Committee for Rehabilitation and Overhaul of Under-developed Nations' General Economies have been trying for months to get a request for mining equipment for d'Land through MEDDLE—"

"SCROUNGE was late on the scene," Whaffle said. "First come, first served. That's our policy at MEDDLE. Good day, gentlemen." He strode off, briefcase under his arm.

"That's the trouble with peaceful worlds," the SCROUNGE committeeman said. "Boge is a troublemaker, so every agency in the Corps is out to pacify her. While my chance to make a record—that is, assist peaceloving d'Land—comes to naught." He shook his head.

"What kind of university do they have on d'Land?" asked Retief. "We're sending them two thousand exchange students. It must be quite an institution."

"University? D'Land has one under-endowed technical college."

"Will all the exchange students be studying at the Technical College?"

"Two thousand students? Hah! Two *hundred* students would overtax the facilities of the college."

"I wonder if the Bogans know that?"

"The Bogans? Why, most of d'Land's difficulties are due to the unwise trade agreement she entered into with Boge. Two thousand students indeed!" He snorted and walked away.

RETIEF stopped by the office to pick up a short cape, then rode the elevator to the roof of the 230-story Corps HQ building and hailed a cab to the port. The Bogan students had arrived early. Retief saw them lined up on the ramp waiting to go through customs. It would be half an hour before they were cleared through. He turned into the bar and ordered a beer.

A tall young fellow on the next stool raised his glass.

"Happy days," he said.

"And nights to match."

"You said it." He gulped

half his beer. "My name's Karsh. Mr. Karsh. Yep, Mr. Karsh. Boy, this is a drag, sitting around this place waiting..."

"You meeting somebody?"

"Yeah. Bunch of babies. Kids. How they expect— Never mind. Have one on me."

"Thanks. You a Scoutmaster?"

"I'll tell you what I am. I'm a cradle-robber. You know—" he turned to Retief— "not one of those kids is over eighteen." He hiccupped. "Students, you know. Never saw a student with a beard, did you?"

"Lots of times. You're meeting the students, are you?"

The young fellow blinked at Retief. "Oh, you know about it, huh?"

"I represent MUDDLE."

Karsh finished his beer, ordered another. "I came on ahead. Sort of an advance guard for the kids. I trained 'em myself. Treated it like a game, but they can handle a CSU. Don't know how they'll act under pressure. If I had my old platoon—"

He looked at his beer glass, pushed it back. "Had enough," he said. "So long, friend. Or are you coming along?"

Retief nodded. "Might as well."

AT the exit to the Customs enclosure, Retief watched as the first of the Bogan students came through, caught sight of Karsh and snapped to attention, his chest out.

"Drop that, mister," Karsh snapped. "Is that any way for a student to act?"

The youth, a round-faced lad with broad shoulders, grinned.

"Heck, no," he said. "Say, uh, Mr. Karsh, are we gonna get to go to town? We fellas were thinking—"

"You were, hah? You act like a bunch of school kids! I mean...no! Now line up!"

"We have quarters ready for the students," Retief said. "If you'd like to bring them around to the west side, I have a couple of copters laid on."

"Thanks," said Karsh. "They'll stay here until takeoff time. Can't have the little dears wandering around loose. Might get ideas about going over the hill." He hiccupped. "I mean they might play hookey."

"We've scheduled your reembarkation for noon tomorrow. That's a long wait. MUDDLE's arranged theater tickets and a dinner."

"Sorry," Karsh said. "As soon as the baggage gets here, we're off." He hiccupped again. "Can't travel without our baggage, y'know."

"Suit yourself," Retief said. "Where's the baggage now?"

"Coming in aboard a Croanie lighter."

"Maybe you'd like to arrange for a meal for the students here."

"Sure," Karsh said. "That's a good idea. Why don't you join us?" Karsh winked. "And bring a few beers."

"Not this time," Retief said. He watched the students, still emerging from Customs. "They seem to be all boys," he commented. "No female students?"

"Maybe later," Karsh said. "You know, after we see how the first bunch is received."

Back at the MUDDLE office, Retief buzzed Miss Furkle.

"Do you know the name of the institution these Bogan students are bound for?"

"Why, the University at d'Land, of course."

"Would that be the Technical College?"

Miss Furkle's mouth puckered. "I'm sure I've never pried into these details."

"Where does doing your job stop and prying begin, Miss Furkle?" Retief said. "Personally, I'm curious as to just what it is these students are travelling so far to study —at Corps expense."

"Mr. Magnan never—"

"For the present, Miss Furkle, Mr. Magnan is vacationing. That leaves me with the question of two thousand young male students headed for a world with no classrooms for them...a world in need of tractors. But the tractors are on their way to Croanie, a world under obligation to Boge. And Croanie holds a mortgage on the best grape acreage on Lovenbroy."

"Well!" Miss Furkle snapped, small eyes glaring under unplucked brows. "I hope you're not questioning Mr. Magnan's wisdom!"

"About Mr. Magnan's wisdom there can be no question," Retief said. "But never mind. I'd like you to look up an item for me. How many tractors will Croanie be getting under the MEDDLE program?"

"Why, that's entirely MEDDLE business," Miss Furkle said. "Mr. Magnan always—"

"I'm sure he did. Let me know about the tractors as soon as you can."

MISS Furkle sniffed and disappeared from the screen. Retief left the office, descended forty-one stories, followed a corridor to the Corps Library. In the stacks he thumbed through catalogues, pored over indices.

"Can I help you?" someone chirped. A tiny librarian stood at his elbow.

"Thank you, ma'am," Retief said. "I'm looking for information on a mining rig. A Bolo model WV tractor."

"You won't find it in the industrial section," the librarian said. "Come along." Retief followed her along the stacks to a well-lit section lettered ARMAMENTS. She took a tape from the shelf, plugged it into the viewer, flipped through and stopped at a squat armored vehicle.

by Keith Laumer

"That's the model WV," she said. "It's what is known as a continental siege unit. It carries four men, with a half-megaton/second firepower."

"There must be an error somewhere," Retief said. "The Bolo model I want is a tractor. Model WV M-1—"

"Oh, the modification was the addition of a bulldozer blade for demolition work. That must be what confused you."

"Probably—among other things. Thank you."

Miss Furkle was waiting at the office. "I have the information you wanted," she said. "I've had it for over ten minutes. I was under the impression you needed it urgently, and I went to great lengths—"

"Sure," Retief said. "Shoot. How many tractors?"

"Five hundred."

"Are you sure?"

Miss Furkle's chins quivered. "Well! If you feel I'm incompetent—"

"Just questioning the possibility of a mistake, Miss Furkle. Five hundred tractors is a lot of equipment."

"Was there anything further?" Miss Furkle inquired frigidly.

"I sincerely hope not," Retief said.

III

LEANING back in Magnan's padded chair with power swivel and hip-u-matic contour, Retief leafed through a folder labelled "CERP 7-602-Ba; CROANIE (general)." He paused at a page headed Industry.

Still reading, he opened the desk drawer, took out the two bottles of Bacchus wine and two glasses. He poured an inch of wine into each and sipped the black wine meditatively.

It would be a pity, he reflected, if anything should interfere with the production of such vintages...

Half an hour later he laid the folder aside, keyed the phone and put through a call to the Croanie Legation. He asked for the Commercial Attache.

"Retief here, Corps HQ," he said airily. "About the MEDDLE shipment, the tractors. I'm wondering if there's been a slip up. My records show we're shipping five hundred units..."

"That's correct. Five hundred."

Retief waited.

"Ah...are you there, Retief?"

"I'm still here And I'm still wondering about the five hundred tractors."

"It's perfectly in order. I thought it was all settled. Mr. Whaffle—"

"One unit would require a good-sized plant to handle its output," Retief said. "Now Croanie subsists on her fisheries. She has perhaps half a dozen pint-sized processing

plants. Maybe, in a bind, they could handle the ore ten WV's could scrape up...if Croanie had any ore. It doesn't. By the way, isn't a WV a poor choice as a mining outfit? I should think—"

"See here, Retief! Why all this interest in a few surplus tractors? And in any event, what business is it of yours how we plan to use the equipment? That's an internal affair of my government. Mr. Whaffle—"

"I'm not Mr. Whaffle. What are you going to do with the other four hundred and ninety tractors?"

"I understood the grant was to be with no strings attached!"

"I know it's bad manners to ask questions. It's an old diplomatic tradition that any time you can get anybody to accept anything as a gift, you've scored points in the game. But if Croanie has some scheme cooking—"

"NOTHING like that, Retief. It's a mere business transaction."

"What kind of business do you do with a Bolo WV? With or without a blade attached, it's what's known as a continental siege unit."

"Great Heavens, Retief! Don't jump to conclusions! Would you have us branded as warmongers? Frankly—is this a closed line?"

"Certainly. You may speak freely."

"The tractors are for transshipment. We've gotten ourselves into a difficult situation, b a l a n c e-of-payments-wise. This is an accommodation to a group with which we have rather strong business ties."

"I understand you hold a mortgage on the best land on Lovenbroy," Retief said. "Any connection?"

"Why...ah...no. Of course not, ha ha."

"Who gets the tractors eventually?"

"Retief, this is unwarranted interference!"

"Who gets them?"

"They happen to be going to Lovenbroy. But I scarcely see—"

"And who's the friend you're helping out with an unauthorized transshipment of grant material?"

"Why...ah... I've been working with a Mr. Gulver, a Bogan representative."

"And when will they be shipped?"

"Why, they went out a week ago. They'll be half way there by now. But look here, Retief, this isn't what you're thinking!"

"How do you know what I'm thinking? I don't know myself." Retief rang off, buzzed the secretary.

"Miss Furkle, I'd like to be notified immediately of any new applications that might come in from the Bogan Consulate for placement of students."

"Well, it happens, by coincidence, that I have an application here now. Mr. Gulver of the Consulate brought it in."

"Is Mr. Gulver in the office? I'd like to see him."

"I'll ask him if he has time."

"Great. Thanks." It was half a minute before a thick-necked red-faced man in a tight hat walked in. He wore an old-fashioned suit, a drab shirt, shiny shoes with round toes and an ill-tempered expression.

"WHAT is it you wish?" he barked. "I understood in my discussions with the other...ah...civilian there'd be no further need for these irritating conferences."

"I've just learned you're placing more students abroad, Mr. Gulver. How many this time?"

"Two thousand."

"And where will they be going?"

"Croanie. It's all in the application form I've handed in. Your job is to provide transportation."

"Will there be any other students embarking this season?"

"Why...perhaps. That's Boge's business." Gulver looked at Retief with pursed lips. "As a matter of fact, we had in mind dispatching another two thousand to Featherweight."

"Another under-populated world—and in the same cluster, I believe," Retief said. "Your people must be unusually interested in that region of space."

"If that's all you wanted to know, I'll be on my way. I have matters of importance to see to."

After Gulver left, Retief called Miss Furkle in. "I'd like to have a break-out of all the student movements that have been planned under the present program," he said. "And see if you can get a summary of what MEDDLE has been shipping lately."

Miss Furkle compressed her lips. "If Mr. Magnan were here, I'm sure he wouldn't dream of interfering in the work of other departments. I...overheard your conversation with the gentleman from the Croanie Legation—"

"The lists, Miss Furkle."

"I'm not accustomed," Miss Furkle said, "to intruding in matters outside our interest cluster."

"That's worse than listening in on phone conversations, eh? But never mind. I need the information, Miss Furkle."

"Loyalty to my Chief—"

"Loyalty to your pay-check should send you scuttling for the material I've asked for," Retief said. "I'm taking full responsibility. Now scat."

The buzzer sounded. Retief flipped a key. "MUDDLE, Retief speaking..."

Arapoulous's brown face appeared on the desk screen.

"How-do, Retief. Okay if I come up?"

"Sure, Hank. I want to talk to you."

In the office, Arapoulous took a chair. "Sorry if I'm rushing you, Retief," he said. "But have you got anything for me?"

Retief waved at the wine bottles. "What do you know about Croanie?"

"Croanie? Not much of a place. Mostly ocean. All right if you like fish, I guess. We import our seafood from there. Nice prawns in monsoon time. Over a foot long."

"You on good terms with them?"

"Sure, I guess so. Course, they're pretty thick with Boge."

"So?"

"Didn't I tell you? Boge was the bunch that tried to take us over here a dozen years back. They'd've made it too, if they hadn't had a lot of bad luck. Their armor went in the drink, and without armor they're easy game."

Miss Furkle buzzed. "I have your lists," she said shortly.

"Bring them in, please."

THE secretary placed the papers on the desk. Arapoulous caught her eye and grinned. She sniffed and marched from the room.

"What that gal needs is a slippery time in the grape mash," Arapoulous observed Retief thumbed through the papers, pausing to read from time to time. He finished and looked at Arapoulous.

"How many men do you need for the harvest, Hank?" Retief inquired.

Arapoulous sniffed his wine glass and looked thoughtful.

"A hundred would help," he said. "A thousand would be better. Cheers."

"What would you say to two thousand?"

"Two thousand? Retief, you're not fooling?"

"I hope not." He picked up the phone, called the Port Authority, asked for the dispatch clerk.

"Hello, Jim. Say, I have a favor to ask of you. You know that contingent of Bogan students. They're traveling aboard the two CDT transports. I'm interested in the baggage that goes with the students. Has it arrived yet? Okay, I'll wait."

Jim came back to the phone. "Yeah, Retief, it's here. Just arrived. But there's a funny thing. It's not consigned to d'Land. It's ticketed clear through to Lovenbroy."

"Listen, Jim," Retief said. "I want you to go over to the warehouse and take a look at that baggage for me."

Retief waited while the dispatch clerk carried out the errand. The level in the two bottles had gone down an

inch when Jim returned to the phone.

"Hey, I took a look at that baggage, Retief. Something funny going on. Guns. 2mm needlers, Mark XII hand blasters, power pistols—"

"It's okay, Jim. Nothing to worry about. Just a mix-up. Now, Jim, I'm going to ask you to do something more for me. I'm covering for a friend. It seems he slipped up. I wouldn't want word to get out, you understand. I'll send along a written change order in the morning that will cover you officially. Meanwhile, here's what I want you to do..."

Retief gave instructions, then rang off and turned to Arapoulous.

"As soon as I get off a couple of TWX's, I think we'd better get down to the port, Hank. I think I'd like to see the students off personally."

IV

KARSH met Retief as he entered the Departures enclosure at the port.

"What's going on here?" he demanded. "There's some funny business with my baggage consignment. They won't let me see it! I've got a feeling it's not being loaded."

"You'd better hurry, Mr. Karsh," Retief said. "You're scheduled to blast off in less than an hour. Are the students all loaded?"

"Yes, blast you! What about my baggage? Those vessels aren't moving without it!"

"No need to get so upset about a few toothbrushes, is there, Mr. Karsh?" Retief said blandly. "Still, if you're worried—" He turned to Arapoulous.

"Hank, why don't you walk Mr. Karsh over to the warehouse and...ah...take care of him?"

"I know just how to handle it," Arapoulous said.

The dispatch clerk came up to Retief. "I caught the tractor equipment," he said. "Funny kind of mistake, but it's okay now. They're being off-loaded at d'Land. I talked to the traffic controller there. He said they weren't looking for any students."

"The labels got switched, Jim. The students go where the baggage was consigned. Too bad about the mistake, but the Armaments Office will have a man along in a little while to dispose of the guns. Keep an eye out for the luggage. No telling where it's gotten to."

"Here!" a hoarse voice yelled. Retief turned. A disheveled figure in a tight hat was crossing the enclosure, arms waving.

"Hi there, Mr. Gulver," Retief called. "How's Boge's business coming along?"

"Piracy!" Gulver blurted as he came up to Retief, puffing hard. "You've got a hand in this, I don't doubt!

Where's that Magnan fellow?"

"What seems to be the problem?" Retief said.

"Hold those transports! I've just been notified that the baggage shipment has been impounded. I'll remind you, that shipment enjoys diplomatic free entry!"

"Who told you it was impounded?"

"Never mind! I have my sources!"

Two tall men buttoned into gray tunics came up. "Are you Mr. Retief of CDT?" one said.

"That's right."

"What about my baggage!" Gulver cut in. "And I'm warning you, if those ships lift without—"

"These gentlemen are from the Armaments Control Commission," Retief said. "Would you like to come along and claim your baggage, Mr. Gulver?"

"From where? I—" Gulver turned two shades redder about the ears. "Armaments?"

"The only shipment I've held up seems to be somebody's arsenal," Retief said. "Now if you claim this is your bagggage.. "

"Why, impossible," Gulver said in a strained voice. "Armaments? Ridiculous. There's been an error..."

AT the baggage warehouse Gulver looked glumly at the opened cases of guns.

"No, of course not," he said dully. "Not my baggage. Not my baggage at all."

Arapoulous appeared, supporting the stumbling figure of Mr. Karsh.

"What—what's this?" Gulver spluttered. "Karsh? What's happened?"

"He had a little fall. He'll be okay," Arapoulous said.

"You'd better help him to the ship," Retief said. "It's ready to lift. We wouldn't want him to miss it."

"Leave him to me!" Gulver snapped, his eyes slashing at Karsh. "I'll see he's dealt with."

"I couldn't think of it," Retief said. "He's a guest of the Corps, you know. We'll see him safely aboard."

Gulver turned, signaled frantically. Three heavy-set men in identical drab suits detached themselves from the wall, crossed to the group.

"Take this man," Gulver snapped, indicating Karsh, who looked at him dazedly, reached up to rub his head.

"We take our hospitality seriously," Retief said. "We'll see him aboard the vessel."

Gulver opened his mouth.

"I know you feel bad about finding guns instead of school books in your luggage," Retief said, looking Gulver in the eye. "You'll be busy straightening out the details of the mix-up. You'll want to avoid further complications."

"Ah. Ulp. Yes," Gulver

said. He appeared unhappy.

Arapoulous went on to the passenger conveyor, turned to wave.

"Your man—he's g o i n g too?" Gulver blurted.

"He's not our man, properly speaking," Retief said. "He lives on Lovenbroy."

"L o v e n b r o y?" Gulver choked. "But...the... I..."

"I know you said the students were b o u n d for d'Land," Retief said. "But I guess that was just another aspect of the general confusion. The course plugged into the navigators was to Lovenbroy. You'll be glad to know they're still headed there—even without the baggage."

"P e r h a p s," Gulver said grimly, "perhaps they'll manage without it."

"By the way," Retief said. "There was another funny mix-up. There were some tractors—for industrial use, you'll recall. I believe you cooperated with Croanie in arranging the grant through MEDDLE. They were erroneously consigned to Lovenbroy, a purely agricultural world. I saved you some embarrassment, I trust, Mr. Gulver, by arranging to have them offloaded at d'Land."

"D'Land! You've put the CSU's in the hands of Boge's bitterest enemies!"

"But they're only tractors, Mr. Gulver. Peaceful devices. Isn't that correct?"

"That's...correct." Gulver sagged. Then he snapped erect. "Hold the ships!" he yelled. "I'm canceling the student exchange—"

His voice was drowned by the rumble as the first of the monster transports rose from the launch pit, followed a moment later by the second. Retief watched them out of sight, then turned to Gulver.

"T h e y ' r e off," he said. "Let's hope they get a liberal education."

V

RETIEF lay on his back in deep grass by a stream, eating grapes. A tall figure appeared on the knoll above him and waved.

"Retief!" Hank Arapoulous bounded down the slope and embraced R e t i e f, slapping him on the back. "I heard you were here—and I've got news for you. You won the final day's picking competition. Over two hundred bushels! That's a record!"

"Let's get on over to the garden. Sounds like the celebration's about to start."

In the flower-crowded park among the stripped vines, Retief and Arapoulous made their way to a laden table under the lanterns. A tall girl dressed in loose white, and with long golden hair, came up to Arapoulous.

"Delinda, this is Retief—today's winner. And he's also the fellow that got those workers for us."

Delinda smiled at Retief.

"I've heard about you, Mr. Retief. We weren't sure about the boys at first. Two thousand Bogans, and all confused about their baggage that went astray. But they seemed to like the picking." She smiled again.

"That's not all. Our gals liked the boys," Hank said. "Even Bogans aren't so bad, minus their irons. A lot of 'em will be staying on. But how come you didn't tell me you were coming, Retief? I'd have laid on some kind of big welcome."

"I liked the welcome I got. And I didn't have much notice. Mr. Magnan was a little upset when he got back. It seems I exceeded my authority."

Arapoulous laughed. "I had a feeling you were wheeling pretty free, Retief. I hope you didn't get into any trouble over it."

"No trouble," Retief said. "A few people were a little unhappy with me. It seems I'm not ready for important assignments at Departmental level. I was shipped off here to the boondocks to get a little more experience."

"Delinda, look after Retief," said Arapoulous. "I'll see you later. I've got to see to the wine judging." He disappeared in the crowd.

"Congratulations on winning the day," said Delinda. "I noticed you at work. You were wonderful. I'm glad you're going to have the prize."

"Thanks. I noticed you too, flitting around in that white nightie of yours. But why weren't you picking grapes with the rest of us?"

"I had a special assignment."

"Too bad. You should have had a chance at the prize."

Delinda took Retief's hand. "I wouldn't have anyway," she said. "I'm the prize."

END

★ ★ ★ ★ ★ ★ ★ ★ ★ ★ ★ ★ ★ ★ ★ ★

HUE AND CRY

The place where readers and editor meet . . .

Dear Editor:

Just read *Jots and Tittles*. You're one up on me— I don't even know what a jot is. Having just come into repossession of part of my 1952-53 collection of SF magazines (& having proceeded to plow into them voraciously) I am in a better position than the average younger reader to understand the change that has taken place. And I can understand why no one wants a letter column any more. Simply —what for? To read that Joe Blow, Irma Grinkle and Ichabod Schmerdlikov all think you publish a pretty good magazine? Who needs it? *This* is Hue & Cry? No, this is plain old-fashioned egoboo, interesting to you but not to the readers. If that's all that's in the mailbag, then best lay Hue & Cry to rest.

However—now we push up our sleeves and go to work— I gather that you'd rather resurrect the body. Well, come to think of it, I can't tell you how to do that, but I can tell you what *I think* is killing it/him/her.

1. Lame or pedantic editorials. No, yours wasn't *this* issue. And yes, I realize how difficult it becomes month after month. I'm sure you read all the other SF magazines. How many editorials are an end in themselves? They pick (or should I say pick *on*?) a subject and then talk it to death. By the time the editor has finished it, it's a complete classroom lecture, with no need for a question-and-answer period. Or how many e d i t o r i a l s piddle through a page or so while the editor mealy-mouths a few

trite comments on this month's issue? A good healthy percentage of the letters in the lettercols of the "good old days" dealt with the "bright, sparkling" (your words, not mine) *editorials.*

2. Indifferent answers to letters. Yes, some of yours fall into this category. Ain't nobody can answer a fan like Ray Palmer and Sam—Mines or Merwin? I'd have to look it up. Anyway, they didn't pass the buck. And they weren't above telling some nut to go soak his head in formaldehyde. Which brings us to

3. Your gray hairs are showing, Dad. Ten to twenty years ago you were all roughly in the same age bracket. A twenty-year-old fan could write to a twenty-five-year-old editor as he would to an old pal. No worries about whether the letters sounded immature. "This is my old buddy, Joe. I'm gonna tell him that story stank. His judgment was way off on that one." Now Dad, where are we going to dig up a kid who'll tell *F*R*E*D*E*R*I*K P*O*H*L*!!! that his judgment was off and he should go soak *his* head? Nobody's gonna take a poke at dear old Dad while he's sittin' on the porch in his rockin' chair.

All right, all right, cease and desist, Dad. I can see you've risen from the chair; now come down off the porch and take a poke at me. Don't look to the other youngsters for help. Can you take it, Dad? You can call me names, too. But the one I like best is—

(Name omitted; see below)

Dear Editor:

If you publish my letter of the 20th, please, just use my initials.

"P.C."

* You want free-swinging answers? But sometimes the freest-swinging comment a fellow can make is just to say —no comment! *Editor.*

* * *

Dear Editor:

Ho, "bright sparkling letters" the man wants. But DearMisterEditorSir, it's been so long since we've had a chance to sparkle and we're so badly out of practice. Part of the trouble is that while the editors have not minded when the readers sharpened their wits against one another they took a certain degree of exception to having the mental fang of said readers whetted against their magazines. Does this mean that the humble reader can occasionally wittily pan some portion of your magazine and have his golden words see the light of day? If so, the good ol' days may well return again.

Pat Scott
Box 401
Anacortes, Washington

* Sure. Say what you like—just so it's interesting. (And printable.) If you touch us on

the raw we won't object in the least. All we'll do, we'll reach out and whomp you on the head with the rung of this here rocking chair. *Editor.*

* * *

Dear Editor:

The impossible happened. *If* got a letter column. This must have sparked something, for immediately it began to change for the better.

Book reviews would be really, and I mean *really,* welcomed back again.

Roger Cox
c/o Lt. Col. B.C., Cox
01309348
Hq. Frankfurt Mil. Dist.
APO 757, N. Y. C.

* * *

Dear Editor:

I'm afraid I have nothing but compliments for you this month, but I keep telling myself that they can't keep up the good work at Digest Publications much longer. Old Fred will slip sometime, and then I'll be able to lower the boom. Really your stories get better all the time and wonder-wise you've got them all beat. You've recaptured some of the spirit of good ol' *Planet,* and that is surely quite a feat. (You have even got them beaten in one respect: Your illos are even worse than theirs used to be.)

Oh, incidentally, why don't you print street addresses in H&C?

Guess I'll sign off with a little poetry (?) this month:

There once was an editor moved
His great magazine to improve.
And since Fred took over
If's been a mover,
So, guys, let's stay in the groove!

Dale E. Randles, Jr.
650 Gretchen Road
Chula Vista, California

* * *

Dear Editor:

I liked the drawing of Retief and the Flap-jacks in the current *If.* How about some stories from Poul Anderson?

I don't like the heading of the cover. I wish you would put *If* in big letters...but keep up the good work.

Jimmy Porter
Springfield, Tennessee

* Anderson's coming up next month. Cover's changed this month. Anything else you want, Jimmy? *Editor.*

* * *

Dear Editor:

The thing that strikes me the most about *If* is the poor reproduction. 'Fess up, it's lousy. The covers have been quite poorly r e p r o d u c e d, though the pictures themselves were okay.

Rating the last three *Ifs,* in eachish I put Laumer's story

in first place. I really like Retief. Keep him as a regular feature.

Reader Sarant is too demanding. Those writers he listed don't write much any more. Heinlein's on his list—I'd flip if I saw a RAH in *Galaxy* or *If*.

Douglas Mackey
1825 North Main
Hutchinson, Kansas

* Better drag out the old trampoline. You have about sixty days to practice flipping before the next issue hits the stands. *Editor.*

* * *

Dear Editor:

Where are the new authors, you ask. Let me tell you.

One of the fan clubs ran a fiction contest for amateurs this year. Cash prizes, almost a hundred bucks. (Some of us care enough about stf to put up our own money to improve the state of the art.)

There were fifty entries, mostly from organized fandom. Here is what happened:

About half trapped in the dead end of short-shorts with surprise endings. Seventy per cent don't know what a story *is*. (Specifically: An incident is not a story, neither is a series of incidents without continuity between them.) Some could write characterization (I recall with gusto and glee a 14-year-old girl who did it with dialogue), but what good are characters without a story? Some have a rare gift for communicating mood and feelings, but all too often overdo it, as though they had just discovered the dictionary.

In simple words, then, they fall prey to all the problems of beginning authors. They can do part of it, but not all.

A dead loss? Don't be silly, there were about ten that came out, by the scoring system used, as "the type written by an amateur close to selling, or by a pro who bangs out a dud under the influence of a hangover." A flaw or two, but not too many.

There were more, four of them in fact (in my own not so modest opinion as preliminary judge—punishment for thinking of the idea) which came pretty close to this month's issue of *If*, except for Leiber, of course. But, and a Jupiter size "but" it is, too, two were less than 1,000 words, and who buys those unless the author's name is Fred Brown?

Conclusions? You bet, and this is likely to cause a shriek of agony from the hard-hearted editor. A question: If a new writer is overjoyed at comment and criticism from just another amateur, what wouldn't they give for a few words from an editor scribbled on the back of the rejection slip?

Ah, what a dream. You could gain a place in the amateur writers' hall of fame for the price of this little time. ("Time? What's that?" he says with a sigh.) Just tell them a little direction, and yo might find all sorts of new writers. Alas, what a job, finding a tame pro to do this for you. Will you shed a tear?

Clayton Hamlin
28 Earle Avenue
Bangor, Maine

*We *do* buy stories from fans—there are around a dozen in inventory right now. We *do* buy stories under 1,000 words—and not only from Fred Brown—provided they are *stories.* (That's hard to do.) And we *can't* write personal notes with all, or even very many, rejected manuscripts. It isn't really because we're hard-hearted, or lazy either. Figure it out yourself. We get something around 4,000 manuscripts a year. Multiply that by, say, 10 minutes each—or whatever you think would be necessary to write a note on each one. (And we'll let you in on a little secret: It is not merely the time spent to write one note, but the time spent on the follow-up correspondence that *inevitably* results, that really begins to hurt.)

Still, there's something in what you say, and you've given us an idea. Starting now, *If* is going to make it a point to publish at least one *first* story in each issue. How long we'll keep it up is up to you; at least a year or so, we hope forever. This isn't a contest; no prizes; no entry blanks; they'll be considered just as any other story is considered and paid for in the same way. But—this month we present the first sale made by Joseph Green, *Once Around Arcturus.* (He has made several since, by the way.) Next issue, *The Man Who Flew* by Charles B. Cunningham, Jr. Etc.

So...let's see what happens next.

And for another slant on the same problem, see the next letter. *Editor.*

* * *

Dear Editor:

In order to search out new fan writing talent, and to inspire a renewed interest in the field of writing science fiction, the publisher of *Inertia* is sponsoring The First Annual Phann Fiction Contest. There will be three grand prizes, all of which are to receive special awards, plus having the chance for professional publication.

For details, please write me.

B. Joseph Fekete, Jr.
36026 Center Ridge Road
Apartment #3
North Ridgeville, Ohio

* *If* and *Galaxy* neither participate in nor sponsor this contest, but we will consider prize-winning stories for possible publication. *Editor.*

* * *

Dear Editor:

With that editorial you threw your readers quite a curve. The trouble is, the entire problem is more than the prevention of the war and/or its possibility. The problem fully stated has two factors: how can we prevent a war of the greatest magnitude?

I imagine you'll get a number of Answers based on the solution of the first factor, the prevention of the war. But it is not the nature of the human race to fit itself into any one set of characteristics, and for this reason you can't eliminate war or the possibility of war. Nor can you expect men to use less than their most potent weapons.

Accepting this as so, we will consider the second factor. What do I mean by magnitudes of disaster? Well, assume that you are a starving man. If you have only one egg and lose it, you'll die, but if you have two eggs and lose one, you'll still live. In both cases the disaster is the same; the loss of an egg. The decisive and only difference lies in the per cent of the whole the loss represents. The magnitude of disaster depends upon the per cent of the whole lost; a greater per cent means a greater magnitude, a lesser per cent, a lesser magnitude.

All this can be applied to worlds. If Earth is destroyed while it is the only home of mankind, it is the End. Its destruction becomes an event of much less magnitude when it is only one of many human inhabited worlds. Through the conquest of space we will soon be making our mark on other planets and when we do we'll be solving the problem. In less years than you have fingers we will no longer have to worry about total destruction.

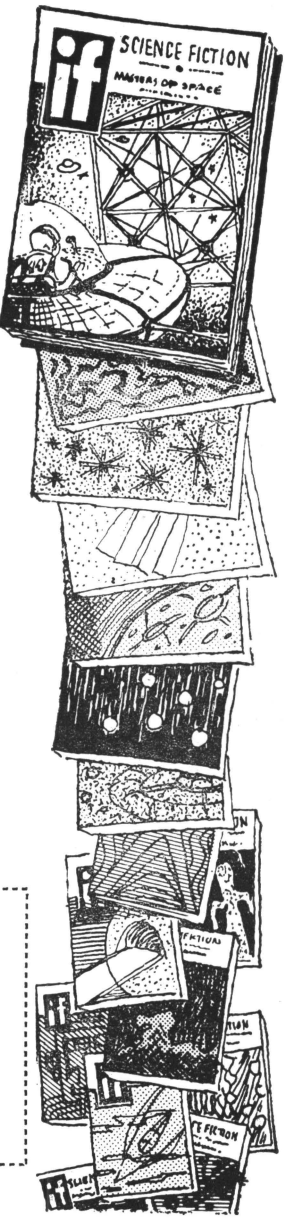
Keeping in mind the idea that we will not be able to prevent war, the conquest of space gives us further opportunity to deduce its magnitude beyond providing us with more eggs. When (not if) the next war is fought it may be good strategic and tactical policy to do most of the fighting in space, for I am fairly certain that no planet can stand a determined attack from space. One's best chances for defense will lie in stopping the enemy before they arrive. Moreover, a space fleet should be able to minimize the amount of devastation a nation can perpetrate on another of the same planet.

All in all, now that we're shopping for Answers, I think the conquest of space is our best, if not our only, buy. Besides, we don't even have to sell anybody—it's already being carried out!

J. R. Parks
921 4th Ave.
Rochelle, Ill.

YOURS!

THE NEXT 16 BIG ISSUES OF IF



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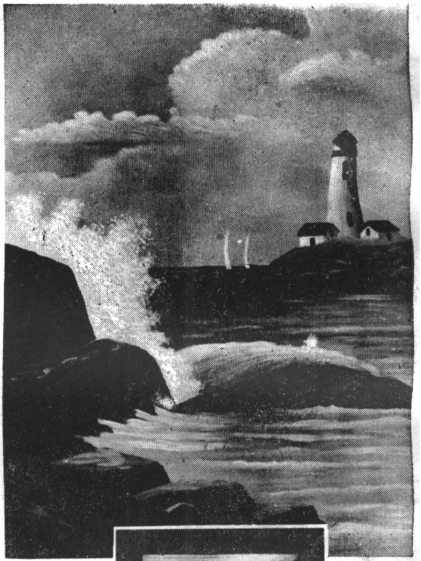

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