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CITIES OF TOMORROW

Our back cover this month is artist Julian S. Krupa's conception of what the city of the future will be like. Fifty years from now this city will be a reality.

THE evolution of the city, from the first group of cave dwellings to the present day metropolis, is a story of steady progress. It has been a slow evolution and even in modern times, with the added impetus of great mechanical civilization, it has proceeded at a very regular, and leisurely pace. With the building of the Woolworth tower, skyscrapers first came into the limelight as the most advanced point of city buildings. The evolution at that point was significant, in that it meant the erection of huge edifices, not for homes, as cities had always primarily been, but as places of business, in no way connected with shelter as it is applied to the home. Today's city can be a place wherein no family dwells, but reserved for business alone. In the future city, we might expect this trend to continue, and more than likely, it will. But it also seems likely, that with the improvement of the mechanical marvels being developed for the removal of smoke, purification of air, producing artificial climates inside huge buildings, that gradually the city building will become a place both for the family and for the business.

Industry will occupy the lower levels, business the middle levels, and the family, the top levels. There will be a class of people who prefer to live in the city, with all its artificial comforts, and there will be the class of people who will renounce the city entirely as a place of abode.

It is certain that buildings will become huge. They will be giant cities within cities, each building containing all the elements of a separate community within itself. It will not be necessary for the person who lives in the air-conditioned, artificially climatized upper level, to leave his own building to procure all the necessities of his life. He will be served by a bee-hive community fed by the workers of the underground levels, served by an immense network of transportational feed-lines from all parts of the country.

Transportation itself will bring the road right up into the buildings they serve. The person who commutes to the city to perform his work, will arrive on an aerial highway far above the streets, reserved for pedestrians. He will park his car in the same building, perhaps never reaching the ground level until he returns to his far-away home in the evening. If he does not drive his own car, he will travel on swift trains serving main building centers, and will utilize helicopter planes instead of the taxi of today to get to his own particular place of business.

Airports atop huge buildings will provide transportation to all parts of the world. Private flying will be as prevalent as commercial, and the skyways of the future city will be crowded by private planes, perhaps restricted as to area of approach and to specialized lanes, to avoid accidents. Underground will be the freight levels of transportation. Swift trains, fleets of giant busses and trucks, and even pneumatic tube-ways, bearing both freight and passengers from building to building.

The future city will not be the smoky, unhealthy city of today. No longer will the city dweller need to go to the country to get a breath of fresh air in his lungs. The air in the city will be as pure, or even purer, than that in the rural areas.

Invisible rays will eliminate germs; inaudible sound waves will precipitate dust and smoke. New types of motors will eliminate fumes of combustion type engines.

All buildings will be completely air-conditioned, and temperature-regulated. Lighting will be indirect, and walls will be of glass, admitting soft, pleasing daylight at all times. There will be no contact with the outside world, its roar or clatter, and noise will not enter the quiet office or insulated home.

Accidents will be cut to a minimum, due to equal distribution of traffic, one-way travel on all roads, and perfect traffic control, handled automatically by electric-eye controls. All cars will be equipped with controls which function according to traffic signals received from the robot traffic directors. An operator, entering the city, would switch on his automatic controls, and in event of danger the halting, or speeding up of the car would not depend on his own senses and judgment, but upon infallible electric eyes, operating in split seconds.

In the past, greatness in cities depended to a great degree on geographical location, and a good harbor, navigable waterways, and other natural factors played a great part in the history of the city's progress. But not so the city of the future. Man will no longer depend on harbors and waterways, and natural resource proximity to furnish his city with the necessities of its existence. He will have mechanical ability great enough to overcome natural obstacles. Space, distance, transportation, and time element will be a minor factor. Cities can be built anywhere, and climate will not be an obstacle to greatness. The science of man has brought his city to the threshold of a new greatness.

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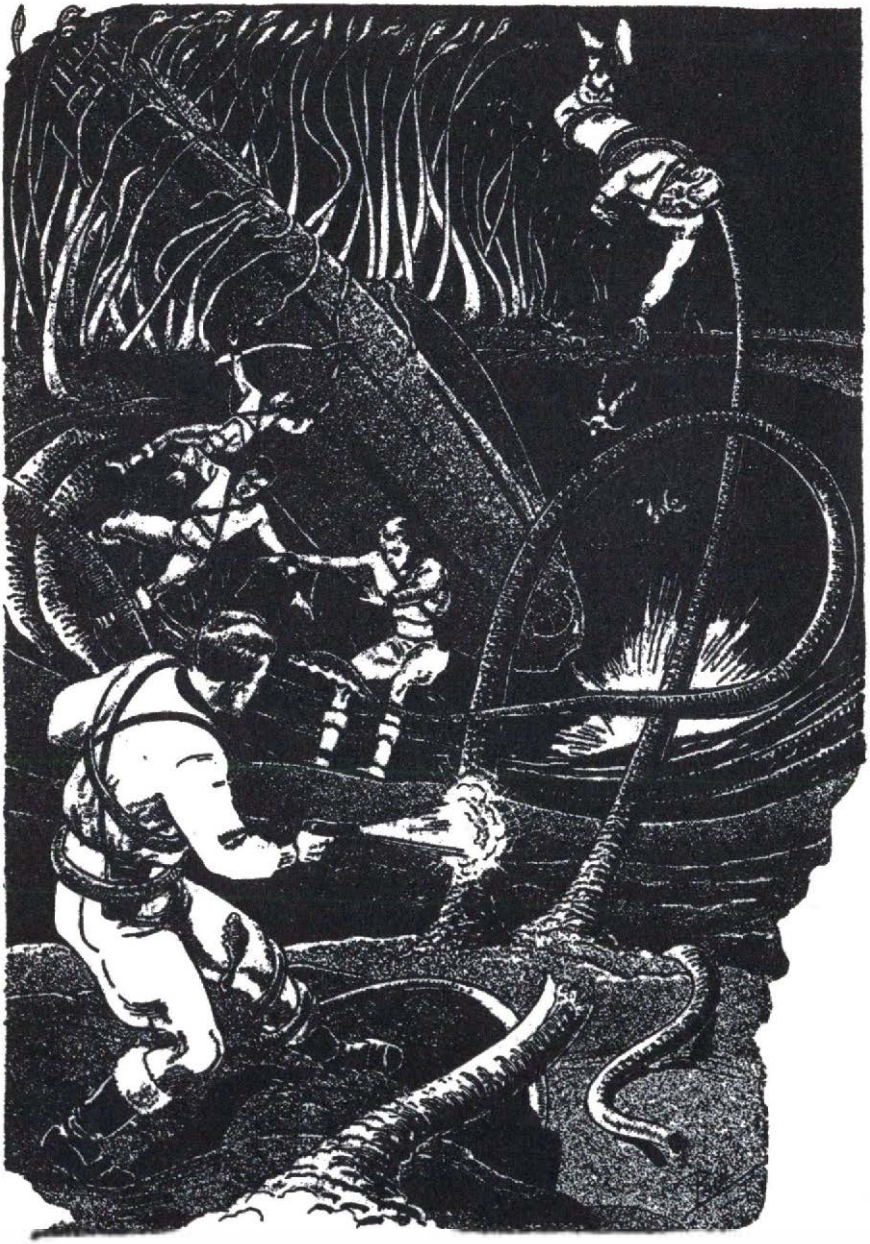


The Monster OUT OF SPACE

by MALCOLM JAMESON

This was no planetoid wandering in the void. It was a living monster, threatening to eat whole worlds. Could Berol's science stop it?

"GRAB something, folks, and hang on. I'm putting this little packet down on her tail!"

Bob Tallen shoved home the warning-howler switch, pushed the intership phone transmitter away from him, and jabbed the ignition control for the reversing tube.

Before the blasts fired, he threw two turns of his sling around him and thrust himself easily against the braces. Sudden decelerations were all in the day's work for him. He lay there grinning at the dismayed cries wafted to him from the laboratory compartment just behind. He heard the crash of glass even above the vibration of the belching tube.

The trim little *Sprite* shuddered, then bucked. Slowly and tremblingly, she began her turn. It was not often the exquisite little yacht of Fava Dithrell experienced the rough and ready hand of a Space Guardsman at her throttle. Usually the ship took a more demure pace.

"Bob! What happened?"

Fava herself had laboriously clawed her way to the control room, pulling along by the grab-irons in the fore-and-aft passage. Walter Berol, panting and dripping rusty-colored slime, clung uncertainly behind her. Both looked startled, but Berol also looked sheepish.

"Breakers ahead," announced Tallen calmly. "Some bonehead of a lighthouse tender forgot to recharge the beacon, or it's been robbed, or a meteor hit it. Anyhow, I thought I'd heave to and have a look-see."

"B-but . . . why so suddenly?" complained Berol, looking ruefully at his reeking smock. "I-I . . . that is, we . . ."

"Sudden is my nature," answered Bob Tallen serenely, jutting his jaw a trifle. "The situation called for a stop. So I stopped. It's as simple as that."

"Oh," said Berol.

"Walter was showing me how to use the laboratory he rigged up for me," explained Fava with a little flush, "and we were looking at a culture of those *vermes horridans*—those nasty pests that overrun Dad's plantations on Titania. You spilled 'em all over him when you reared back like that!"

"Tough," commented Tallen, looking casually up at the pulsating red light

on the control board. It indicated a considerable celestial body not far ahead.

"I thought he could take care of himself. He's as big and husky as I am."

"Oh, I get it," Berol spoke up with a good-natured laugh. "The big bad caveman was up here all alone, and he thought it was time he got in an inning."

"Boys! Boys!" protested Fava. "Don't spoil our vacation. You sound like a pair of infants."

Walter Berol grinned.

Bob Tallen laughed too. "What the hell—nothing like a little emergency to pep up a party. Trot out the space suits, Fav, and we'll all take a stroll as soon as I can put this can alongside that rock, whatever it is."

Fava tapped her foot in annoyance, but there was a twinkle in her smoldering black eyes. She got a big kick out of the friendly rivalry of her two suitors. She liked them both immensely, even if they were as different as the poles.

Bob Tallen—Commander Tallen of the Space Guard—was bold, impetuous and able. He already had every decoration the Systemic Council could bestow. He would tackle a herd of Martian *felisaurs* barehanded if Fava were threatened, and never think twice while he was doing it. She liked him for his swift decisions and his daring.

WALTER BEROL—*Doctor* Berol to the world, director of the Biological Institute — was easily more clever, but cursed with an incurable shyness that had all but wrecked his career. Yet, given time, he could solve any problem. Moreover, he was considerate and possessed of a droll sense of humor that made him good company anywhere. He was solid gold, even if not spectacular.

Fava felt the ship lurch as Tallen cut out two more tubes. The visiplate was glowing now, and a strange object was coming into focus.

"I'm damned," muttered Tallen, looking from his "Asteroid List" to the visiplate and back again. "Listen to this." He read:

> The planetoid is known as Kellog's 218, and is a coffin-shaped iron body with some quartz inclusions. A Class R-41 buzzing beacon is installed, its period—

"Pear-shaped, I'd call it," said Fava. "It's a funny-looking thing, isn't it?"

"Looks like a rotten canteloupe impaled on an iron bar," remarked Berol.

"And at that end—where that pink, mushy-looking stuff is," exclaimed Fava, with growing excitement, "it seems to be covered with high grass!"

"Yes," said Berol, watching narrowly, "and it's undulating—as if in a breeze!"

"Nonsense," growled Bob Tallen, staring at the visi-screen. "How could there be wind on a boulder like that—and where did you ever see grass beyond Mars?"

It was a queer sight they saw in the visiplate—a writhing, doughy mass seemingly plastered on one end of Kellog's planetoid. And there was no beacon.

"Watch yourself!" called Tallen. "I'm landing."

* * *

WHEN Walter Berol and Fava were well up onto the first of the doughy terraces, they were astonished at how differently it appeared than as they had seen it from the ship. What they thought was mushy substance turned out to be a firm but yielding covering, much like dressed leather.

The waving grasses on closer examination appeared to be clusters of bare

stalks of the same dirty pink material, standing like wild bamboo. Yet their eyes had not deceived them. The grasses *did* move, gently undulating as do the fronds of huge marine growths in terrestrial oceans.

"What do you suppose *those* things are?" Fava suddenly asked, looking down after the two had advanced a bit between two avenues of the strange clumps. At the girl's feet, scattered in the pathway, were little crimson knobs, like half-buried tomatoes.

"They look squishy," Fava said, and kicked one with her toe.

Her shrill scream followed so instantly that Berol was dazed. The nearest of the clusters came to life with startling speed. A snaky antenna dived downward like the curving neck of a swan and threw its coils around Fava. Paralyzed by the swiftness and unexpectedness of the attack, Berol stared dumbly as the groping tip took two more turns and was creeping onward to enwrap the girl's leg.

Berol fumbled at his belt for his hand-ax, and yelled hoarsely into his helmet microphone for Bob Tallen. Tallen could not be far away.

Before Berol could free his ax, he heard Fava's strangling gasp. The crushing pressure of the tentacle had choked off her breath. Horrified, he saw her being lifted upward; glimpsed a yawning, purple slit opening up a few feet beyond.

Berol's blood ran cold, but he attacked the clutching tentacle with all the fury he could muster. The first blow rebounded with such violence as to almost hurl the hatchet from his hand, but he struck and struck again. He saw little nicks appear, and a dark, viscous fluid ooze out, splattering. Half blinded by tears of helpless rage and sweat, he kept on hacking.

Then he knew he could not raise his arm, and he felt the lash of some heavy thing across his shoulders. His faceplate was fogged and he could not see, but he felt the hideous nuzzling beneath his armpit and then the cold, rib-cracking constriction as another of the frightful antennae seized him. He had only time to cry out once more:

"Help, Bob—Fava—Bob . . ."

Then he fainted.

"HE'S coming round."

It was Bob Tallen, speaking as through a bloody mist. Berol knew, from the sweet abundance of the air, that he must be out of his suit. He must be on the ship, then. He stirred and opened his eyes, saw Fava hanging over him, looking at him anxiously. Then he remembered—those entwining, crushing, cruel tentacles; and the vile, sticky blood of the beast—gaping, waiting, slimy and nauseating. Berol shuddered. But Fava was safe!

"It's okay, old man," he heard Tallen's reassuring voice. "You've been pretty sick, but it's all over now. We're hitting the gravel at Lunar Base in an hour, and there's an ambulance waiting. In a couple of weeks you'll be good as new."

"That . . . thing . . . was . . . organic," Berol managed. "Did . . . you . . ."

"Forget it," said Tallen. "The sky is full of weird monsters. I burned that one down with my flame gun, and that's that. I daresay that rock was swarming with 'em, but never mind. It's two hundred million miles away now."

Berol tried to forget it, but he could not. He could not forget that he had been at Fava's side when she was imperiled, and that he had failed. It was Tallen who blasted the monster down—whether it was animal or vegetable or some hideous hybrid.

So he was thinking as he tossed and

fretted in his room in the great hospital in Lunar Base, knowing that Bob Tallen was making hay while the sun shone. Tallen was still at the base, fitting out the new cruiser *Sirius* which he was to command. He had all his evenings free, however, and these he spent in company with Fava. . . .

"You are a dear, sweet boy and I'm fond of you," Fava told Walter Berol, as she walked out with him the day he was discharged. They were on the way to the launching racks to see Bob Tallen take off for his shakedown voyage. "But the man I marry must be resourceful, masterful. I'm sorry . . . I don't want to hurt you . . . but . . ."

"It's to be Bob, then?"

She nodded, and suddenly the universe seemed very empty. Then a feeling of unworthiness almost overwhelmed him. Yes, she was right. He lacked the red-blooded qualities she admired in Bob Tallen. He was not fit mate for her.

But as suddenly another emotion surged through him. It was the old primeval urge—old as the race itself—of a man balked of his woman. He meant to have her, Tallen or no Tallen.

"You will not marry Bob," said Walter Berol quietly.

CHAPTER II

The Heavenly Monster

FAVA'S voice had been urgent, frightened.

"Come over to Headquarters at once! I am so afraid—for Bob."

Walter Berol stood only for a moment on the landing deck atop his great laboratory before stepping into the gyrocopter, but in that moment he cast an uneasy glance at the serene star-spangled canopy overhead. Disquieting thoughts were running through his mind.

In the three weeks since Bob Tallen and the *Sirius* had departed, many disturbing reports had come in from the asteroid belt. Eleven sizable planetoids were missing from their orbits—vanished! A dozen assorted cargo ships were overdue and unreported. A lighthouse tender had sent a frantic S.O.S. through a fog of ear-splitting static, and had been choked off in the middle of it with the words, "We are being engulfed . . ."

The gunboat *Jaguar,* sent to aid the tender, had not been heard of since. It was all very inexplicable. It was ominous.

Berol strode past the grim-faced sentries outside the General Staff Suite. As Director of the Biological Institute, he could enter those carefully guarded precincts. Inside, the room was jammed with officers, listening intently and gazing at the huge visi-screen. Fava sat beside an Admiral Madigan, fists white as snow as she clutched the arm of the chair. Berol stopped where he stood. A deep bass voice was coming in through the Mark IX televox.

"That's Bill Evans, in the *Capella,*" whispered someone.

"We've finally caught up with the thing, whatever it is, and are close aboard now. We have circumnavigated it twice, but there is not the slightest trace of the *Jaguar* or any other ship."

Walter Berol was staring at an incredible landscape slipping beneath the *Capella's* scanner. It was a dirty pink, and studded with many curious knobs of writhing tubular matter. It looked soft and mushy, very much like a rotten pumpkin. It strangely resembled the bulbous end of Kellog's 218. Berol shuddered at the memory. Evans went on, ". . . the waving clumps mentioned by the *Jaguar* just before her radio went dead are not visible. All I can see is mounds of what looks like Gar-

gantuan macaroni lying in heaps. The skipper is about to land. In a minute or so I'll give you a close-up. Stand by!"

There was a raucous blare of unusually heavy static, and when the voice did begin again, it was hard to make out the words. The static distorted the visuals, too, so that the screen was a blur of crawling pink light and no more. Presently the operators managed to eliminate the worst of the noise, and the voice came through once more, bellowing out against the deafening barrage of sound.

". . . surface very deceptive . . . quite hard and tough. A landing party has gone out through the lock and is cutting samples of the surface with drills and axes. One man is chopping at a huge crimson growth as big as a barrel. Hold on—one of those hillocks of collapsed tubing is moving! The things are whipping around like snakes! Some of them have shot straight up into the air, and others are curling all around us!"

Berol edged his way through the crowd. Fava was breathing hard. Admiral Madigan's jaw was granite and his eyes never wavered from the screen.

". . . they are tentacles! One has wrapped itself around our bow, and another group has caught us amidships. That is why we roll and pitch this way. The captain is clearing away the Q-guns. In a minute we will blast out—you'd better cut down on your power until that is over. There he goes . . ."

A dull roar filled the room and the walls trembled. Then the volume dropped. Brilliant scarlet light slashed and stabbed across the visiplate, and then it went almost black as if obscured by thick, oily smoke.

". . . all stern tubes in full discharge. The surface of the planetoid—if this damn thing *is* a planetoid—is smoking furiously. Several clusters of the antennae astern of us have been burned away. We're still hung here, though. Looks like the impulse of the tubes is not enough to tear us loose from that grip forward . . ."

A wail of unearthly static drowned out the laboring voice. Then,

". . . trying the bow-tubes now. Wait. No, they can't get out that way . . . the spacelock is submerged and we're twisting over fast! A huge crevasse has opened up under us. We're sinking into it! The whole port is covered. We—*a-a-awrk!*"

The voice ceased, choked off, and the light on the screen went out abruptly. In the dark room no one spoke for an instant. Berol felt, rather than saw, the tension among the hardened Space Guard officers. Fava's hand crept into his and clung to it.

The *Capella* had just gone to the doom they had so nearly missed, for there was no mistaking the similarity between this monster of unguessable nature and the menace on Kellog's 218.

"RAISE *Sirius!*" broke in Admiral Madigan's voice, crisp and angry. "What the hell is Tallen doing all this time?"

But the *Sirius* was there, hovering over the spot where the *Capella* had been, her shattering Q-rays lashing down, searing acres of the ravenous false asteroid. She turned on her televox so that those at Headquarters could see the quivering, sizzling terrain below. Clumps of the three hundred foot antennae were being roasted to a sooty ash, and swelling and popping with evil gases as they did. Bob Tallen's voice came through, strong and clear, barking out strident orders.

Nothing the *Sirius* could do, however, could save her floundering sister. The upper turret of the *Capella* sank out of

sight, and the scorched, leathery integument closed over it. In a few minutes there was only a livid, ashen scar, and even that mark faded.

Commander Bob Tallen's face came onto the screen, huge in its close-up.

"Heat does it," he said tersely. "Send me all you've got, and H. E.—feroxite by the ton. I'll blast the damn thing to shreds, and then burn the shreds."

As the face faded, Admiral Madigan sprang into action.

"Out of here, all of you! Squadrons Three, Six and Ten take off at once. Report to Tallen when you get there. All reserve flotillas will install heavy-duty flame projectors and take on fuel to capacity. Report to me the instant you are ready."

He jerked out other curt orders and the officers hastened from the room. Fava had withdrawn to one side, looking on with eyes wide with horror. How well she knew the grip of those merciless tentacles! For there could be no mistaking that the monstrosity she had just been watching was the same as that on Kellog's 218, grown larger. And she sickened at the memory of the slimy fissures the vile beast seemed to open at will. It filled her with dread, for Bob Tallen was going to attack the thing, and he was rash, so reckless in his daring.

"Oh, Walter!" she cried, clutching Berol by the arm. "Do you think . . ."

Walter Berol shook his head gloomily.

"It is too late for brute force. The thing is too big. We should have found out something about its nature and destroyed it when it was little. But it must be four miles in diameter now, and growing as it feeds. All our fleet can have no more effect than a swarm of gnats nibbling at a rhinoceros. If it is to be attacked at all, it must be through its biological processes. Bob is attempting the impossible."

Admiral Madigan wheeled, a smile of cold scorn curling on his lip.

"So! The dreamer leans from his ivory tower to look us over and tell us we're wrong. Well! And what is the solution the great brain has to offer? Quickly! This is an emergency—men have died before our eyes!"

"I—don't—know," said Dr. Berol slowly. "It will take time, research. I will begin at once. . . ."

"Bah!" snorted Madigan. "Research! It is lucky that there are men of action at hand. Like our Tallen."

He turned away abruptly, leaving Walter Berol standing where he was, his face aflame. Dull anger rose in his breast, but there was pity mingled with it—pity for the blind arrogance of these self-styled men of action, who thought they could control this colossal menace with their puny weapons.

For of all the men in that room, only Berol realized to the full the immensity of the threat that hung over the Solar System. If the monster had drifted in as a spore from the beyond, consumed cosmic gravel until it was big enough to digest a body like Kellog's iron planetoid, where would it stop? After the asteroids, what would it devour? The planetary moons, perhaps. And after those?

In that instant Walter Berol resolved to stop this Mooneater—and knew that he would face ridicule and obstruction. But the pink menace was more than a threat to the race—it had become a personal symbol. The creature, whatever its nature, had attacked the woman he loved, then crushed and humiliated him in her presence. Now it had brought the taunt of this space admiral.

"Fava," he said abruptly, "I want the use of the *Sprite*."

"And if I refuse it?"

"Then I shall commandeer it in the

name of the Institute."

THE air of quiet finality in his tone startled her. He had used it once before—the day he said she would not marry Bob Tallen. She looked at him wonderingly, then shrugged prettily. Let him try; he meant well. But she was sure he would fail. Out in the cold, gravityless vacuum of space he would fail as he always had outside his laboratories. That did not matter. What did matter to her just then, was that she saw a pretext to be near her sweetheart.

"Very well, Walter," Fava agreed, smiling. "But remember, I am rated as a laboratory helper—and the *Sprite* is my yacht. I intend going, too."

"But the danger . . ."

"Bob is in danger too," she said simply.

* * *

"DEAD," murmured Walter Berol. On the table in the *Sprite's* flying laboratory lay a clumsy Venusian rock-chewer—the *Lithovere Veneris* — a queer, quartz-eating variety of armadillo. Seen through the fluoroscope, all its internal organs were still.

"A twentieth of a grain of *toxicin** has no effect—a tenth kills it."

"So you think—" Fava was looking on.

"No. It is merely worth trying. The Mooneater's internal chemistry may be the same; it may not. We have twelve drums of the stuff on board. I want to plant it on the monster's next victim. Then we will watch for the effect."

The next victim was the small planetoidal body Athor. Men had learned something of the predatory habits of the pink invader. This tremendous monstrosity swerved from orbit to orbit by the manipulation of magnetic fields, which it set up with a howling of static. Inexorably it pursued the cosmic body until it overtook it. Then, without any crash of collision, the marauder would split open along its leading face and take the planetoid bodily into itself. The maw would snap shut and the Mooneater would move on, bigger and more ravenous, to its next prey.

Fava set the *Sprite* down in the dismal Athor canyon known as South Valley. There was barely time for what they had to do, as the Mooneater was already a huge and growing disk in the black sky. They could even make out the lightning playing over its surface where Tallen's cruisers hung in a cloud, ever blasting, burning and harassing. Time after time they had scarified its surface, until there were only black stumps where the antennae clumps had been, but as often the monster grew fresh ones.

Walter Berol put on a space suit and with four of his crew sought a cave in which to cache their deadly drug toxicin. But hardly had they emerged from the lock when, with a fiery swoop, a huge warship settled to the ground nearby. A dozen helmeted figures sprang from its airlock and bounded toward the grounded yacht.

"What are you fools doing here? This asteroid was ordered evacuated thirty hours ago!"

The voice was Bob Tallen's, harsh and angry.

Then in astonishment Tallen recognized the familiar lines of the *Sprite*, and knew the man before him was Berol.

"My God!" shouted Tallen hoarsely. "Fava here? Get out—at once—while you can!"

He pointed to the oncoming Mooneater, which now filled a quarter of the

* *Toxicin*, a powerful chemical substance which is capable of breaking down and dissolving the proteins of certain living creatures, such as the rock-chewer Venus, described here as an armadillo-like creature.—Ed.

sky.

"I see it," replied Walter Berol. "We will leave as soon as we dump some drums of chemicals. I am planting a dose of poison . . ."

"Arrest this man!" Bob Tallen whirled on the bluejackets who had followed him.

The sailors from the *Sirius* pounced on Berol and bore him protesting and struggling into the *Sprite*, Tallen following close behind. Inside the yacht Tallen snapped orders to the other ship. The airlocks of both vessels rang shut, and on the instant they plunged upward with streaking wakes of flame.

"Look," said Bob Tallen dramatically, pointing back at the asteroid.

The Mooneater was no more than four diameters away. It had opened its maw, revealing a slimy, purplish cavern. Five minutes later the ghastly pseudo-lips were closing in on the periphery of little Athor. Then there was but a livid line to mark where the asteroid had gone. The pink monster rolled on, heedless of the massed cruisers stabbing at it with their Q-rays and heat guns.

EVERYONE gasped a little. "If it had not been for me," Tallen went on, his face a thundercloud, "you—and Fava—would be inside there. I have placed you under restraint to save you from your own idiocy. This is a man's game. It is no time to play around with theories. Action is what is required now."

"You've been in action for two months," retorted Walter Berol with pointed irony. "The Mooneater, I believe, has approximately trebled its volume in that time. If that is how effective action is, I think it is high time somebody did a little *thinking*."

"That's my worry," snapped Tallen. "The Autarch, head of the Systemic Council, has given *me* this job. When I want help I'll ask for it. Until then, you are to keep out of my way."

CHAPTER III

Pursuit

FROM Mars the destruction of Deimos was plainly seen. Every eye, every telescope, every pair of binoculars was trained on the oncoming scourge. Batteries of cameras drank in every detail through telephoto lenses. Photographic plates were made from ultra-violet and infra-red rays. At every vantage point the Omnivox announcers set up their mikes and described the battle to the thoroughly aroused citizenry of the Solar System.

Bob Tallen, now a Space Guard commodore, had set up his controls in the south tower of the administration building in Ares City. He was ready for the final test of strength between his forces and the hitherto irresistible pink menace. Under his direction Deimos was honeycombed with galleries and tunnels—miles of mines packed with tens of thousands of tons of feroxite. Around Mars' equator, heavy siege guns had been placed to assist the ships in their bombardment. In one tremendous concentration of flame and violent detonation Tallen proposed to blast the marauder to bits.

The *Sprite* was safely tucked away in Martian Skyyard, and to permit Fava and Walter Berol to witness his triumph, Tallen had made room by his side for both of them.

Fourteen cruisers of the first class, and many dozen lesser ones, had trailed the Mooneater from the asteriod zone, hammering incessantly at it as they followed. Day after day they had pumped high explosives into it and played fierce flames upon its ever-sprouting tentacles.

Hundreds of cargo ships shuttled between the fleet and the bases, bringing fresh supplies of fuel and ammunition. As a demonstration of the sustained application of brute force in massive doses, Tallen's campaign had no precedent. Now he was ready for the kill.

"It won't work, Bob," said Berol mildly, as he watched the huge pink orb advancing on Mars' tiny moon. "The thing is organic, I tell you."

"So what?" barked Tallen. "If it lives, it can be killed, can't it?"

"*If* you can apply enough force at one time. That is what you cannot do. You are trying to kill an elephant by jabbing it with a penknife. Being organic, the creature is capable of self-repair. That is where you're licked. You've got to upset its organic functioning . . ."

"*I'll* upset its functioning," said Bob Tallen grimly, his eye on the monster. It was within one diameter of Deimos. He jabbed the button before him—three times. The attack was on.

A cloud of cruisers darted between the yawning mouth of the Mooneater, letting their salvos go into its open chasm. Others smothered its rear areas with raging flame. And as the Mooneater advanced relentlessly in spite of all until its hideous pseudo-lips closed on the little satellite, Bob Tallen pressed the key that set off the radio-controlled mines.

"Ooooh! Look!" screamed Fava, gripping Berol's arm. "Bob has won! He has torn it to shreds!"

For a few minutes it appeared he had. An immense blister rose as one side of the Mooneater swelled to accommodate the terrific blast of the expanding feroxite gases within. Then the monstrosity burst shatteringly in scores of places, as in a chain of terrestrial volcanoes, tearing great strips of the beast's entrails. Gaping streamers and shreds of purplish flesh were flung out into the void, rent by the explosion. Other strings of viscid stuff drooled from the jagged slot that had been a mouth, only to flash into flame as the ray-guns lashed at them.

Then the throaty roar of thousands of heavy guns from Mars drowned out all other sound. The moment the space ships were clear, the artillery opened up, slamming salvo after salvo into the harried monster. Huge hunks of the leatherlike hide were torn out, leaving ragged craters. Tentacles were blown to flying fragments and ripped away by their roots. With an outpouring of static that exceeded any before, the monster turned away from Mars and headed back toward the asteroids.

BOB TALLEN glared incredulously after the retreating raider. He had hurt it—yes. But it was still *intact!* It had not disgorged the satellite it had just devoured. It was on its way back to complete the clean-up of the asteroids. Cruiser after cruiser fell away from it and headed back to Mars. They were out of ammunition. The great stroke had been made—and had failed!

"With your permission, Commodore Tallen," remarked Walter Berol dryly, "I will take up my researches where I left off. I notice that your high explosive shells have a penetration of something like three hundred feet. When you consider that the Mooneater is upwards of ten miles in diameter, it ought to be clear that you are doing little more than irritating its hide. It must be attacked from within, not externally."

"Research and be damned to you!" Bob Tallen flung at him, reckless in his anger and disappointment. "You keep yelping about what science can do—well, show us! Only keep out of my way."

"I will do that," replied Berol coldly. He rose and left the room, and he did not glance at Fava as he left. He realized the challenge had been given and accepted. His first job was the conquest of the Mooneater. His personal affairs could wait. After all, if the Mooneater was to be permitted to glut itself without stint on the planet bodies of the Solar System, the time was not far off when personal affairs would cease to exist. From that moment Walter Berol dedicated himself to the destruction of the pink monster.

* * *

BEROL did not go near the *Sprite*. Instead he took the space tender *Jennie* from the Martian branch of the Biological Institute and went up and into the orbit of defunct Deimos. Floating there in tumultuous disorder were the gouts of viscous matter ejected from the wounded Mooneater, intermingled with long streamers of jagged and torn tissue. Berol gathered tons of the stinking, filthy stuff and carried it down to the branch laboratory on Mars.

For many weeks he immersed himself in the examination of his specimens. He and his aides sectioned, cultured and analyzed. He was amazed at what he found. The monstrosity was built of proteins!* By some freak of internal chemistry, the creature could actually transmute the heavier elements to lighter ones: convert iron to flesh and quartz to organic fluids.

Yet despite his discovery of the macrocosmic nature of the monster's structure—it had individual cells as big as apples—he could learn little of its constitution as a whole, and nothing of its vital organisms. What he had was bits of the epidermis, or the droolings from its surface fluids. His task was as hopeless as that of reconstructing a whale from a few square inches of torn blubber.

Berol was still doggedly working at his quest when an "All-System" broadcast broke the stillness of his study. When the Autarch spoke, everyone listened.

"The peoples of the Solar System are advised that the Supreme Council has decreed that the wasteful war on the invader popularly known as the Mooneater shall cease. In spite of the gallant efforts of the Space Guard, it has destroyed all our asteroids, including Ceres and the moons of Mars. It is now close to a thousand miles in diameter and quite beyond our power to control . . ."

Dr. Berol gasped. He had lost touch with the outside world and did not know that things had come to such a pass.

"It is ordered, therefore, that all the satellites of the System of less than the destroyed planet bodies be evacuated immediately, and that scientists of every category abandon whatever research they may be engaged in at present, and concentrate on the problem of rendering Jupiter habitable. Our mathematicians have extended the curve of the Mooneater's consumption, knowing the size of the planetoidal bodies remaining, and have computed with great accuracy the date of extinction of each of our planets. Only Jupiter is so huge that the Mooneater can never grow large enough to swallow it.

"The Autarch has spoken!"

WALTER BEROL sat staring at the dead amplifier long after that final click. So Bob Tallen was beaten. The Autarch was beaten. The human race was beaten. It meant extinction, for it was unlikely that great king of

* Protein; an albuminous compound derived from a proteid, one of a class of important compounds found in nearly all animal and vegetable organisms, and containing carbon, hydrogen, oxygen, nitrogen, and sulphur.—Ed.

planets could ever be made habitable for man. And if it should, there was not enough transportation in the System to convey the populations there. . . .

Berol, too, was beaten. He realized that. All the feverish work of recent weeks was wasted. He had reached no conclusions, he had not found the fatal toxin that would kill the monster. Nor had he any clear notion of how to introduce it if he had it. It is true a cobra can kill a bull by the prick of a fang. But Berol had no proven poison, nor the means of injection. And now came the order to drop all work. His failure was complete, for the Autarch's dictum was final.

Wearily he pressed a button on his desk.

"Close our files on the Mooneater," he told his laboratory chief. "Let me have the index on the 'Flora and Fauna of Jupiter'."

* * *

FAVA DITHRELL burst excitedly into Walter Berol's study.

"Walter," she cried, "the Mooneater is here! It is passing Europa now!"

"There is nothing we can do about it," said Berol. "We have orders to disregard it. Anyhow, Callisto is safe for the present."

When Berol had moved his headquarters to be close to Jupiter, he was not greatly surprised to find that Fava was already there as a helper. The order of the Autarch had been for engineers of every degree and all scientists to work on the Jupiter project, and Fava was known as an amateur biologist. Berol had long suspected that she applied for a position in the Callistan laboratories because Bob Tallen was based on nearby Io. Since he had been pulled off the Mooneater hunt, Tallen had been put in charge of the evacuation of Jupiter's minor satellites.

"The Mooneater," Fava was repeating. "It's behaving queerly, Walter. It passed the small outer satellites without touching one of them."

"Hm-m," he mused. "That *is* odd. It may be significant." He drummed the desk with his fingers. "Perhaps it has reached its full growth; it may consume less hereafter."

The behavior of the Mooneater was odd, indeed. It skirted Jupiter's moons on a lazy, incurving spiral, and then departed from the Jovian* System without molesting even its smallest satellite! Speculation was rife. Had the monster attained its optimum—its maximum size? That could be it: each race of creatures has a limiting size. Only time could answer.

But as the panic subsided among the Jovian colonists, screaming accounts of the exodus from the Saturnian System began filling the news. The pink monstrosity was heading that way, and all of Saturn's moons, with one exception, were of edible size.

On rolled the Mooneater. It slid past Phoebe, past Hyperion and Rhea and all the other little moons. It touched none of them, but went on in close to the great semi-liquid planet. There, astoundingly enough, it swam into the midst of the Ring and stayed, floating for weeks about Saturn as a self-elected satellite! Then, as unaccountably as it had come, it left, and spiraled outward to intercept Uranus.

Walter Berol learned of it only because Fava told him. Her father's ranches were located on Titania, and she feared the properties were doomed. Berol shook his head gloomily. There was nothing he could do. The Autarch had repeatedly refused to permit him to resume his efforts. The head of the Council had gone so far as to threaten

*Jove and Jupiter are interchangeable mythological terms. Jovian is the adjective.—Ed.

stern disciplinary measures if the matter was brought up again.

But Fava's account of the Mooneater's actions in the vicinity of Saturn had a galvanic effect on Walter Berol. He jumped up excitedly.

"Yes, yes—of course! I might have anticipated it. The answer lies there, surely. She would have gone into the Rings for no other purpose—"

"*She!*" snapped Fava, her fears scurrying before her sense of outrage. "Why confer *my* sex on that unspeakable monster?" She stamped her tiny foot angrily.

"Yes—she!" Berol fairly shouted. "Don't you understand? We have to deal now with more of the accursed things—thousands, millions of them, perhaps. We must go there at once and stamp out her hellish progeny!"

FAVA was staring at him dumfounded. Such a display of excitement was very rare with Walter Berol. He talked on, vehemently.

"This monster was small once—how small we never knew. In the beginning it probably consumed cosmic sand and gravel, then boulders, then moons. Now it is mature, and like all other living things, it is under the compulsion to reproduce. She has laid her eggs in the Ring gravel!"

Fava's tension broke with a merry tinkling laugh. "Walter, have you gone crazy? Eggs! How fantastic!"

"Not at all. There can be no other conclusion. We see the cycle of the monster's life beginning all over again—with sand and gravel, and small diameter bodies near at hand. Like the bee, the ant and the beetle, she deposits her eggs where food suitable for the newborn is the most abundant. Why else would she abstain from eating those satellites herself? We know her appetite. Hers is the mother instinct!"

Fava gasped. It was a bold idea, but plausible. The Mooneater was a living creature, no one doubted that.

"But will the Autarch—" she began.

"To hell with the Autarch and his one-track mind!" Berol yelled, snatching up his head covering. "Your yacht, Fava—it is completely equipped. We'll defy them all. The existence of the race depends on us. In those baby Mooneaters is the clue to their structure, their chemistry. Come!"

CHAPTER IV

The Fatal Depths

"WE ARE practically at Ring speed now," said Anglin, Fava's sailing master.

All about them hung the glittering quartz and crystalline iron nuggets that swing forever about Saturn in broad bands.

"Good," said Walter Berol. "Turn on the ultra-violet beam."

He slipped on a space suit and went out onto the hull. For a long time he sat, holding a long rod that had a butterfly net at its end, studying the reflected rays sent back by the Ring particles. All about them seemed to be a sort of fog, so filled was the space with suspended dust and sand. Few of the little stones that compose the Ring are larger than marbles. It was a perfect feeding ground for embryo Mooneaters.

It was more than an hour before Berol caught the first embryo, but once he learned the peculiar lemon-yellow light with which they fluoresced, he began hauling them in by the dozens. They were not unlike basketballs—leathery, pinkish orange spheres covered with downlike fuzz. Those tiny hairs were what in time would come to be the horrid tentacles that held smaller prey—until one of the myriads of slit-

like mouths could open beneath.

Walter Berol turned the job of catching the creatures over to a pair of deckhands, and then hurried below with his first specimens. Triumphantly he slammed them down onto the dissecting table before Fava.

Swiftly, and under her watchful gaze, he slit one of the creatures open, cutting it from pole to pole with a green scalpel. He laid bare the hooplike formation of ribs ranged after the fashion of earthly meridians. His knife revealed the heavy circumpolar muscles that pulled the ribs to one side when in the act of eating huge masses. And under the viscid, purplish jelly that filled the body cavity, Berol found the palpitating green organ that must be the brain.

As rapidly as his fingers could fly, Berol traced the outflung intricacies of the branching green nerve-trunks, even to where they terminated at the skin in the tiny red specks that picked up the motor impulses.[1] Berol found the arterial tubes that conveyed the purple life-juices from the central reservoir, and he located the many subsidiary stomachs that lay under the fissured openings. Within an hour he had a clear understanding of the monster's anatomy.

"Bring me a needle of *toxicin*," he ordered.

Fava injected the poison in one of the living specimens, but it had no effect. Then she tried heteraine, and totronol.[2] The totronol was also harmless, but the heteraine had a definite narcotic effect. It caused a temporary paralysis of the parts where it was injected.

"That's something," muttered Berol, after they had exhausted the list of drugs and poisons. "Now for disease germs."

Ranged about the compartment were phials and phials of bacilli. There were samples of the bacteria that caused every disease of man, beast, plant or known monster of the airless, dark planets. There were *skuldrums*—fat, sluglike lumps of fatty stuff that was the fatal enemy of the Plutonian lizard-cats. There were the thready spirochetes that plagued the Venusian rock-chewers, driving them to madness. There were others—globular, tubular, disk-shaped, some winged, some ciliated, some with fins. Each was sure death to some other living thing.

"Here," Berol said to Fava, handing her a tray full of ripped-out nerve ganglia and greenish brain fibre. "Find out whether any of these bacteria thrive in this stuff. I'll tackle the blood angle. Hurry!"

Fava blinked in mock dismay. Walter Berol had never spoken to her in such a brusque and authoritative manner. But she did not dislike it. She took the tray and went.

In ten hours they found the parasite they sought. It was a thin, pale worm —the *illi ulli*, parasite worm of the Venus fish life! Once it was introduced into the green nerve stuff, it multiplied at a terrific rate and quickly consumed it all.

"Now for the grand test," said Berol, as he leaned over a baby Mooneater with a hypodermic filled with a liquid that was crawling with the *illi ulli*. A quick jab, and the thing was done. Within an hour the leathery ball was a flabby corpse, its nervous system gutted

[1] It was Fava's kicking at one of those red nerve-ends that had caused the tentacle to grasp her.—Ed.

[2] *Heteraine* is a narcotic drug, extremely poisonous to humans in anything but infinitesimal doses, although it is a distillate of the paralysis-spray of the Venusian giant boa. *Totronol* is an Earth drug which totally destroys the motor nerves of the spinal column, inducing a permanent and quickly fatal paralysis.—Ed.

by the ravenous worms. As it died, its multitude of slitlike mouths gaped open, gasping like the gills of an air-strangled water fish.

"Eureka!" whooped Dr. Berol, leaping into the air.

THE *Sprite* lurched forward, her jets screaming under forced discharge. Berol slewed the periscope about and took a look astern. Thousands of the leathery balls that might have grown into Mooneaters were springing into fiery incandescence, then exploding with silent *plops!* as the full energy of the backlashing rocket stream struck them. Berol knew there must be many thousands more of them, but someone else would have to sweep them up. He had bigger and more urgent game ahead. But first he must go into Iapetus for some needed supplies.

"Fava, while I am getting my rigging on board, your job is to make the *illi ulli* grow. I want 'em big—as big as possible—as big as anacondas, if you can do it. Force mutations on them with the X-ray, and feed them the synthetic diet I prescribed. Cull out the larger ones and let 'em propagate, and so on."

He snatched up a set of headphones and got through to the Governor of Iapetus. He lied glibly in a manner that simply amazed Fava. For Walter Berol issued a multitude of crisp orders—and said they were in the name of the Autarch and the Systemic Council! And he was probably already down on the punishment list for having vacated his post on Callisto without permission!

"I want," Berol snapped, "two large-capacity cargo ships loaded and ready to hop off tomorrow night. Here is the list of what is to be on board them."

It was an odd list: a two hundred foot derrick, a Myritz-Jorkin drill rig, complete with drill-bits and spare cutting heads; a hundred thousand feet of steel cable on spools; a three-inch detonon gun, with a thousand rounds of H.E. ammunition, but the shells to be unloaded except for delicate fuses; and twenty drums of 80% heteraine solution. With that equipment he wanted a drill crew of huskies and roughnecks from the gas fields of Io.

"That is all," barked Berol, as the acknowledgment came back. He yanked the jack from its socket and turned, to find Fava still by him.

"Well?" he said tartly. "Why aren't you nursing those worms along? Time flies!"

"I wanted to tell you, Walter, that I think you are wonderful." For the first time in many months Fava dropped the bantering tone she usually used toward him. "I had no idea you could be so—masterful! I didn't know . . . well, that you could *do* things . . . I-I . . ."

His impatient frown melted. Then he laughed uproariously for the first time since his encounter with the Mooneater on Kellog's 218.

"Oh, I see. Even you fell for the popular superstition that scientists have to be drier-than-dust, impractical boobs."

"B-but," she stammered, "you were always so clumsy . . . so timid . . . outside the laboratory . . ."

"You saw me trying to do things I didn't know how to do. That is all. But I am back in the laboratory—the whole Solar System is my laboratory now. I'm doing the work I know best. The difference is in the scale of it. I am on my way to inject an animal with disease germs. Since its hide is five or six *miles* thick, it calls for a gigantic needle." He laughed a little grimly.

"SURE!" said old Harvey Linholm, the gigantic six-foot-ten master

rigger who had been supplied with the drilling gear. "We see the whole damn idea. Me and my men will go to hell and back with you, Doc, if it comes to that. We've lost plenty to that moon-gobbling, howling menace, and we're fed up with it. Besides, I'd as soon die right now takin' a crack at the thing as wait and go to Jupiter. I can't see livin' on giant Jupiter—think of what I would weigh there!"

Berol grinned. He turned to the captains of the two supply ships.

"All right, then. Take off at once and proceed to the spot I gave you the geodetics of. I'll overtake you. After that, follow me down."

He hurried away and mounted the ramp up the side of the *Sprite's* launching cradle. An obviously agitated Fava overtook him as he was about to enter the ship.

"We've lost," she moaned. "The *gendarmes* are on the way to seize you. The Autarch has learned of your assumption of authority here and has ordered you brought to the Earth in irons for trial."

"They'll have to hurry," said Walter Berol grimly, swinging the door open. "I'm taking off in ten seconds, Autarch or no Autarch."

"That's not all," Fava said in a low voice. "Bob Tallen has found out where I am and is on his way here to get me. I had a message from him forbidding me to have anything more to do with you."

"Ah," said Berol. "Perhaps Bob could tell us how the Autarch happens to know so much about our expedition."

"Yes," she nodded, and it was almost a whisper.

Berol's face hardened. "I am shoving off—now! You may come or not. Please yourself."

"Let's hurry then," Fava said, closing the lock door behind her. "The police and Bob won't be far behind."

* * *

THE Mooneater was as huge as Luna. Led by the *Sprite*, the little flotilla circled in, warily, surveying the forest of clutching tentacle tips, now reaching thousands of feet into the sky. Lower and lower they flew, until at times they were diving between rows of the clumps.

"Shoot at the red spots," directed Berol, pointing out the nerve-ends. "Or at those greenish veins."

The detonon gun crew slammed in a shell—a shell loaded with the numbing drug heteraine instead of its usual high explosive. They aimed and fired, and as the missile tore its way into the monster's nerve fibre, the nearest group of tentacles lashed and writhed in fury. Eight, nine, ten—shot after shot ripped into the antennaes' controlling ganglia. Then the clutching, whipping arms went limp and collapsed their full two miles in length onto the pink plain beneath.

The ships circled and came back to shoot down another set of antennae. By the time they slid to a stop on the horny hide of the Mooneater itself, the doped tentacles lay in mountainous piles for several miles around them.

"Quick!" commanded Berol, the moment they were at rest. "All hands outside! Squirt more heteraine into every nerve-end you see. We must anesthetize this entire area."

Men scampered about the grounded ships with big cans of heteraine strapped to their backs, jabbing sharpened pipes into the quivering nerve-ends. In a little while that part of the Mooneater was as inert as the floor of a crater on Luna herself. Beyond the narcotized section, the rest of the tentacles could be seen in agitated motion, twisting and clutching. Walter Berol anxiously scanned the black void from which he had come, but he saw no sign

of the jet flames of his pursuers. He might accomplish his purpose yet.

After the anesthetic squads came the riggers. They unloaded the ships where they lay on the Mooneater, and by the time the first rest period had come, the derrick was up. Ten hours later, the hole was spudded in. Then the drill-bits began to grind, gnawing their way down through the horny hide of the monster like steel augers through an ancient cheese.

From time to time Fava and her steward made the rounds of the nerve-ends and shot fresh injections of the deadening drug into them. It was of utmost importance that they keep the monster numb and quiet where they worked, as its slightest shudder would have all the effect of a devastating earthquake. They might lose not only their drill-bits, but the derrick. And somewhere near about must be one of those auxiliary mouths that could engulf them all in a moment.

IT was at a depth of just seven miles that grizzled Harvey Linholm announced his drilling was through. Sticky, viscous purple blood was welling up and spreading lazily about the lip of the hole. That meant they were through the tough outer skin and down into the tenderer tissues beneath.

"Pump it out and set your casing," Berol said, and went to see about his snakes.

Under Fava's forced feeding they were monstrous serpents now, ten feet or more in length, and more fecund and voracious than ever. Selection and high-speed evolution had done miracles. They were unbeautiful worms—slender, eely creatures with forked tails and transparent skins, but they had insatiable appetites and bred at an astonishing rate. Walter Berol felt certain they would do the work he expected of them.

Berol stepped under the derrick presently and gazed down the shiny barrel of the well. To one side stood fourteen crates of selected *illi ulli*, a portable flame-cutter, and a shoulder-size container of heteraine, along with hypodermic injection pipes. The worms were hungry, as always, and squirming and hissing venomously to show their irritation at being cooped up in the long cylindrical baskets. Berol put on the heteraine container and grasped the flame-thrower, then reached for the sling that was to lower him into the depths.

A spasm of revulsion and cold fear suddenly swept over him, and for a moment he shut his eyes out of sheer horror. Thirty-seven thousand feet down into the tissues of this monster—and through a slender forty-inch hole! All the confident self-assurance that had sustained him until then oozed from the biologist. His former timidity threatened to take control again, and his resolution faltered. He was badly rattled.

For in that instant Walter Berol ceased to think of the Mooneater as a mere laboratory specimen, even though a colossal one, but rather as a living adversary. He was about to do what countless generations of men had done before him—enter into mortal hand-to-hand combat with a ruthless enemy!

Vaguely he sensed that Linholm was watching him, awaiting the signal to lower away. And back of the silent group of drillers was a small helmeted figure—Fava. She, too, was watching. And then, as in a vision, Berol was aware of the millions of helpless humans everywhere whose existence hung on his own hardihood. And Bob Tallen was on the way to stop him.

"Lower away," Walter Berol managed, and hoped dumbly that his voice did not reveal the quaver he felt in his soul.

The gleaming neochrome casing quickly turned to a dead black, as he shot past its thousands of fathoms. Down, down he plunged. Then, after what seemed centuries, his pace began to slacken and he knew he must be nearing the bottom. He ceased to feel the slick metal walls, realized he was hanging in a subterranean cavern. His next sensation was that of being plunged knee-deep in slimy mud, only the mud was warm and clinging, like a live thing.

Berol snapped on his crest lamp and looked about him. He was in a huge purple cavern, lined with slime-dripping tissue, and interlacing purple tubes told him he was looking at Gargantuan capillaries. Over in a corner was a bulbous lump of green mush—the creature's nerve stuff—a minor ganglion, no doubt, for the functioning of the antenna clump immediately overhead.

Berol stood clear and sent the sling back up. Now they would send down the baskets of *ilii ulli*. Until they came, he sloshed about in the stinking mire, slashing at the nerve-leads with his machete and injecting each one with a few ounces of heteraine. By the time his serpents came, he had openings ready for their entry into the monster's nervous system.

He unhooked the first of the baskets with trembling hands, but steadied himself with the thought that he was now at the culminating moment of his great experiment. A few more steps, and he would know whether he had succeeded. He had gone too far to weaken, and he tried to shut out of his imagination the seven miles of solid organism that separated him from his kind.

THE pale serpents wriggled vigorously through the muck the moment Berol released them. Their instinct seemed to direct them unerringly, for they made straightway for the nearest nerve fibres. Berol saw their evil-looking heads nuzzle into the incisions he had made, and their forked tails give a final flip as they wriggled out of sight. Then he could hear the horrid gurgling as the half-starved reptiles gnawed into the green substance.

The tenth basket was down and unloaded before Berol felt the cavern shake ominously. That meant the first batches of snakes had penetrated the nerve-trunks beyond the anesthetized area, and that the Mooneater was feeling pain. Berol knew he must expect more of these mountainous shudders, and only hoped his cavern would not collapse until he had at least got all his snakes started. At their rate of propagation Berol was confident he had enough for his purpose.

Laboriously he made his way back to the spot beneath the trunk. Basket number eleven was due. But it was not a basket that came. It was a space-suited figure—a diminutive figure that fell with a rush, and floundered for a moment in the slime on the animal floor.

"You—Fava!" Berol exclaimed.

"Hurry—oh, hurry!" the girl cried. "Come up while there is time! Bob Tallen has come—is landing near us . . ."

The floor beneath them heaved mightily, flung them far apart. Berol's light jarred out, and it was several seconds before he could get it on again. When he did, he saw the place they were in had been squeezed to a third its former volume, and its shape completely changed.

He glanced upward at where the hole had been, but it had been smashed flat. Two lengths of the neochrome casing stuck out, twisted and bent almost beyond recognition. The Mooneater had had a violent convulsion, and the two humans inside it were trapped!

Walter Berol fought his way to Fava,

ducking under writhing capillaries and proceeding on his hands and knees at times. Fava gasped,

"He—Bob—is blasting his way in! Q-rays and flame guns . . . He burned down those antennae to the north of us . . ."

"The blundering fool!" exclaimed Walter Berol. "The one thing he should not have done. If this brute is excited at this stage, we are all lost!"

It looked as if they were indeed, for one terrific upheaval followed another in quick succession. Twice Berol was completely buried in vile semi-liquid tissue, and only his space suit saved him from suffocation. And twice he found Fava again and clung to her. At last the shudderings and quakings diminished; then ceased altogether.

It seemed a forlorn hope, but Berol thought of trying it. He jabbed viciously at his phone button, and monotonously began calling Linholm on the surface. There was a faint chance the thing's writhings might penetrate the heavy roof of monster hide over them.

Then Berol thought he heard a voice, and a little later he got Linholm.

"Things are pretty bad, Doc," Linholm was saying. "I can't help you—not for a day or so. The derrick is down . . . The 'earthquake' did that . . . Can you stick it out until I get the derrick set up again and a new hole drilled?"

Walter Berol groaned. Bob Tallen had played hell for fair.

"What about Tallen's cruiser?" Berol demanded anxiously.

"It's gone," came the answer, so faint it could hardly be heard.

"Gone away?"

"No. Gone down. It landed, blazing away, about a thousand yards to the west of us. A bunch of them tentacle things wrapped themselves around it, and the next thing I knew . . . it wasn't there. It sank plumb into the monster."

BEROL snapped off the phone and stared at Fava. Now he had the explanation of the violent upheavals. It was Bob Tallen's attack and the monster's reaction to it. Tallen's blasting at the edge of the narcotized area had awakened the beast, and it had fought back in its customary manner. The end had been the usual one—Tallen's ship had been engulfed.

The biologist sat stunned for a moment, hardly conscious that Fava was lying alongside him, clinging. His thoughts were a strange mingling of satisfaction and despair. He had inoculated the Mooneater—it would die, in time. He felt sure of that. But he and Fava were trapped, and in the tremendous convulsions that were sure to attend the monster's death agony, they would die, too. He did not mind so much for himself. But Fava . . .

Then he thought of Bob Tallen and his entombed *Sirius*. That was another bit of dramatic irony. The would-be rescuer who had brought death instead of life—and was doomed to die himself. Now he lay a thousand yards away in the corroding acids of one of the monster's minor stomachs—

Walter Berol jumped as if prodded with a bayonet. Inside the *Sirius* there might be safety! It was a race with time. Could the Mooneater digest the warship in advance of its own death struggle? Berol clambered to his feet and dragged Fava up with him.

"Come," he said, and led the girl to the west wall of their deformed cavern.

He handed her the heteraine outfit while he hung on to the flame-cutter. In a few jerky words he told her what he was trying to do, and his explanation seemed to put new life into her, though both of them knew their chances

of finding the cruiser were slim. Compasses were useless inside a creature that emanated erratic magnetic waves, and everywhere there was a hopeless jumble of intertwined blood capillaries and nerve-trunks. The two victims could easily be lost in the first hundred feet.

But they plodded on. It was five hundred feet before they came to a nerve-trunk that had any green substance left in it. The *illi ulli* had done their work well, for in the next few hundred yards they saw many mother serpents accompanied by their huge broods of infant snakes. It was not until after that, that Fava had to use heteraine shots to paralyze the tissues ahead of them.

Berol doggedly burned away or cut the barriers that they encountered. Twice he backtracked to check his orientation. It was well he did, for he discovered on both occasions he and Fava had a tendency to veer off to the north. Aside from hacking out their path, he tried not to think at all. To do that would lead to madness, for there was really no basis for hope.

CHAPTER V

Brain vs. Brawn

AT last they came to the tough stomach wall, and the breaching of it took the last erg of energy in the flame-gun. Berol tossed it into the muck, and jerked back the folds of tissue to allow some of the fuming acids within to flow past. He helped Fava through the hole, and they plunged on, thankful for their acid-resistant suits.

"Too late," said Berol grimly, as he looked up at the hulk that had been the crack cruiser *Sirius*. Her outer hull was gone, leaving only a few gaunt frames, pitted and eaten to knife-thin plates which crumbled at the touch. Corroded decks hung limply, like damp cardboard, dripping slime. All that was left of the ship was the armored central compartment that housed the gyros and the control room.

Yet so good did this man-made thing look, dilapidated and dissolving though it was in this cavern of horrors, that both Berol and Fava instinctively drew closer to it. The biologist helped the girl climb the collapsing decks, and cleared away the slimy mud that clung there. He noticed that no more of it came, and attributed that to the paralysis of this region worked by his worms.

The armored compartment seemed to be tight, so Berol carefully scraped about one of its doors until he had laid the metal bare. Then he tapped with the handle of his knife.

There was an answering tap, after a little. In a moment the door was cautiously opened, and a helmeted officer peered out. It must have been a shock to him to see all the ship outside his compartment gone, and in its place a vague blackness lit only by the crest lamp on one of the suited figures before him. He let them in, and carefully closed the door behind.

Bob Tallen stood in the center of the control room, an expression of deep concern on his face. But as he recognized Fava, he broke into a smile, though obviously a forced one.

"Thank God we found you!" he exclaimed, striding forward as if to embrace her.

"*You* found *us?*" Fava laughed merrily. "Why, you big, clumsy, heroic lummox of a meddler! If you only knew what we've gone through to find *you*, just to tell you to keep your shirt on and you'll be all right!"

Bob Tallen's jaw dropped in sheer amazement. Then he caught on.

"Poor Favikins—I understand. But

you're safe now . . ."

"Don't 'Favikins' me," the girl retorted. "I'm more right in my head than I ever was. I know ability when I see it—*now!* We were doing fine—Walter and I—until you came blundering in and upset everything with your stupid interference.

"We have inoculated this monster with some home-grown spirochetes of our own invention, and it's dying. In about an hour it'll heave up and throw us back onto the surface—where we would be right now, if *you* hadn't butted in!"

Bob Tallen could only stare at her, not knowing how to take her sudden fury.

"And let me tell you one more thing, Robert M. Tallen! I demand you return to Callisto at once, and failing that I am coming after you. Demand, indeed! And who told you that you were anybody's intended husband?"

Just then a violent temblor shook the remainder of the ship until every fixture in it rattled deafeningly. There was a succession of quick heaves, and men had to hang on to stanchions to keep their places.

"Friend Mooneater's sick," remarked Walter Berol blandly. "Stand by for a quick rise!"

THE next fifteen seconds was a tumultuous kaleidoscope. The core of the acid-eaten ship must have turned completely over five or six times before it came to rest. It was an experience such as none of the occupants ever wanted to go through again.

Then Walter Berol boldly opened the door, and they looked out onto as fantastic a landscape as ever a *troolum* * addict imagined. Everywhere huge chasms had opened and thick purplish stuff was puffing up in sickly bubbles. Antennae drooped and collapsed. The Mooneater's surface billowed like a typhoon-swept ocean. The monster was dying. A quarter of a mile away lay the *Sprite* and her two tenders, on their sides, but otherwise unhurt.

"Come, Walter," said Fava. "Now that Bob's all right, we can finish what we started."

"Right-ho!" Berol grinned, and he picked the girl up in his arms and strode away across the heaving plain.

"Look at him," muttered Bob Tallen in disgust. "Showing off his strength! Some people are just too conceited to live!"

* A *troolum* addict indulges in the chewing of the troolum weed, a Martian plant with the power to effect the brain in a delusory manner. Paradoxically, though the Martian name troolum sounds as though the drug induces "true" appearing visions, the exact opposite is the fact. Troolum visions are wild, impossible, incredibly fantastic, and yet, the victim believes implicitly in all he sees.—Ed.

The Space Pirates

(THE SPACE MARINES AND THE SLAVERS)

By BOB OLSEN

When Zurek raided Ganymede, it was up to three men to brave the pirate stronghold

CHAPTER I

THE SACKED VILLAGE

CAPTAIN FRANK BRINK, commander of the rocket ship Hyperion, looked up from the log book in which he was writing a voluminous report describing how the so-called "Space Marines" had successfully mediated a strike of the platinum miners on Jupiter's satellite, Io. Whistling a familiar air, he glanced casually through the heavily insulated, transparent floor of the space ship's control room. What he saw must have startled him, for he suddenly stopped whistling, and yelled, "Hi, there, Dan! Aren't you away off the course?"

Ensign Daniel Mayer was a recent addition to the ranks of the universe-famous Earth Republic Space Navy, having graduated with high honors from the Interplanetary College of Cosmonautics only two years previous. Obviously virile, despite a trim, medium sized figure and a face that was almost too handsome for a man, he looked out upon the world through grey eyes which could either be as grim as a gun muzzle or as playful as a Maltese Kitten.

But there was neither humor nor determination in those steely eyes of his when, in response to his commander's query, he turned around as far as the straps of the control seat would permit him. The expression in them was more like that of a callow youth who has been caught experimenting with his father's electric razor.

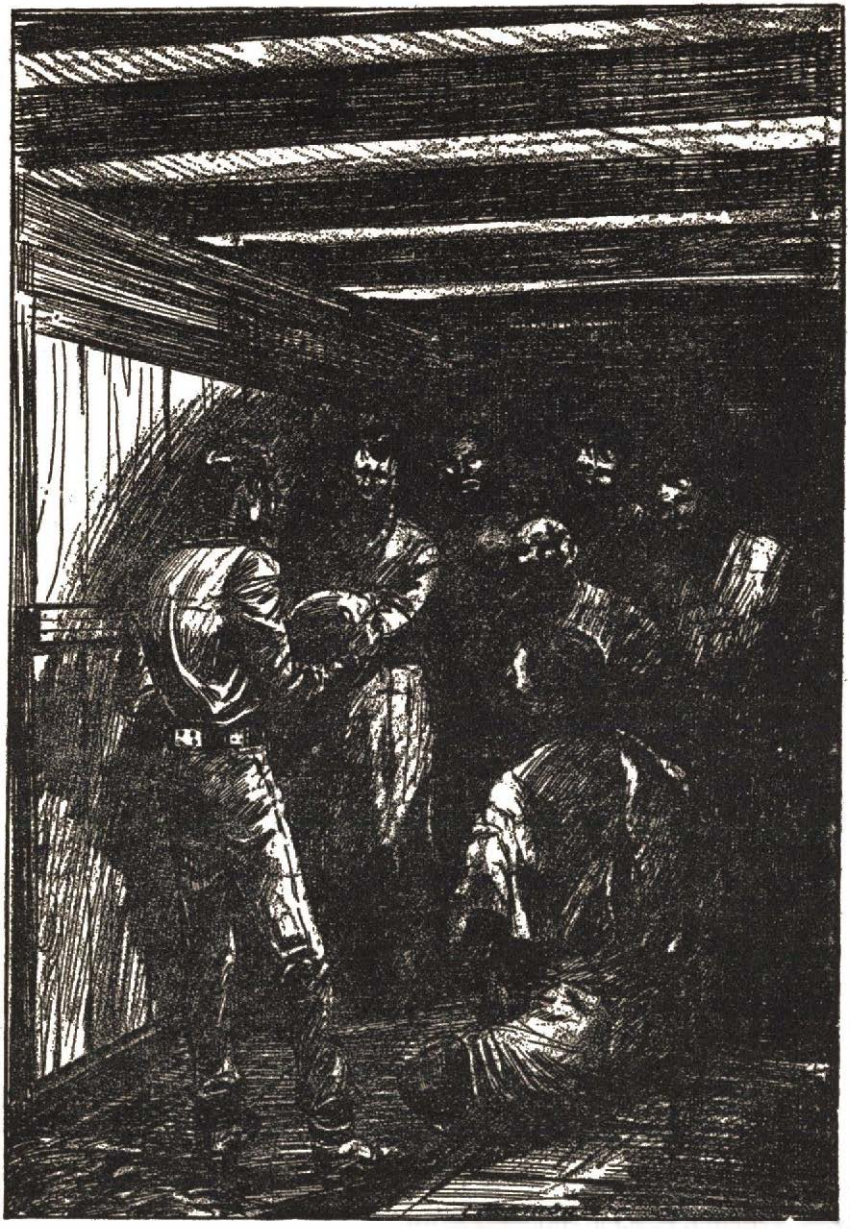
Although he had heard the question clearly, he sparred for time by saying, "I beg your pardon, Chief. Did you address me?"

"Did I address you?" Brink sputtered. "No, you goop, I didn't address you. I only asked you if you aren't away off the course. Unless my eyesight has become obfuscated in my old age, that Lake on the under port bow is Tolako. Am I right or am I incorrect?"

Mayer grinned sheepishly and admitted, "Your eyesight is A. Z., Chief. That *is* Lake Tolako."

"But I thought I told you to set your course for the space-base. What's the idea of circumnavigating Ganymede to get there?"

"Well, you see, Chief," the Ensign alibied, "I've never seen this half of the satellite. Some day I may have to set the ship down on the Western Hemisphere. I thought it would be a



good idea for me to familiarize myself with the terrain. It will take only a minute or two more and I didn't think you'd mind."

"Why don't you tell him the real reason, Dan?"

This disconcerting remark came from the third occupant of the space ship, Lieutenant James Sullivan.

Tall, muscular, with Celtic features and a weather-beaten, saddle-colored skin, Sullivan was reclining languidly in a padded hammock stretched across the control room. Suspended weightlessly a few inches above his chest a peculiar object hovered. Composed of small pieces of metal, it was shaped like a large apple from which some ravenous boy had taken several generous bites. Anyone, who was familiar with the fads of the day, would have recognized it as a three-dimensional, magnetic "jig-saw" puzzle.

From a basket which was also floating in midair, Sullivan selected a tiny section of iron and attempted to fit it into a niche of approximately the same shape. With a grunt of disgusted negation, he put the piece back in the basket and tried another one.

For a few seconds nobody spoke. Apparently Mayer had decided to ignore Sullivan's impertinent question.

It remained for Captain Brink to ask, "What do you mean, Jimmy? Why do *you* think Dan wants to circumnavigate Ganymede?"

"If you really desire to know," Sullivan told him, "Dave's real interest is not so much in the landscape as in the inhabitants of the Ganymede's Western Hemisphere—or perhaps I should have said in one certain inhabitant."

"I still don't integrate with you," the captain rejoined. "You are getting so woozy about puzzles that you even talk that way."

"Then permit me to elucidate. Doubtless you recall that, when Dan arrived on Ganymede a few months ago one of his fellow passengers aboard the space liner was a certain pulchritudinous and flavicomous female by the name of Ingeborg Andersen."

"Oh, you mean the daughter of Lars Andersen, the missionary."

"Herself in person. I understand that during the space flight from Mother Earth to Jupiter's fair satellite, a very sweet little romance developed between the said blonde Nordic and our mutual friend, Ensign Mayer. Perhaps you haven't noticed that he even carries her portrait inside the cover of his gravinul."

"Isn't anything sacred from your prying eyes?" Dan growled. Then to Captain Brink be said, "Jimmy is right, Chief. Miss Andersen is my principal reason for wanting to come this way. You see, I've had a sort of premonition—an intuition of impending danger or—"

"A what?" Brink yelled.

"Well, a sort of hunch that the mission—" Mayer bit off his sentence in the middle and then went on: "Nothing would please me better than to find out that my fears are unfounded, but I just couldn't resist the temptation to make sure. I hope you don't mind, Chief."

Before Brink could answer, Sullivan interposed with: "Of course he doesn't mind! After all, Captain Brink is human, you know, and I understand that even he was young and romantic once upon a time."

Brink grunted and muttered, "A. Z., Dave. Go ahead and treat yourself to as much Norwegian blonde as you can see from an altitude of fifty kilometers. You understand, of course, that we cannot descend any lower than

that until the rocket brakes have been turned on."

"Of course, Chief," was Mayer's grateful response. "Thanks for your permission. I believe I can see enough in the teleview either to confirm or to disprove my premonitions." Then, as an afterthought, he added, "I hope it will be the latter."

LIKE all modern spaceships, the Hyperion was equipped with a high powered teleview which not only magnified but also amplified the images of distant objects in much the same way that an old-fashioned radio set amplifies sound.

Keeping his eyes fixed on a crystal sphere about a foot in diameter, which bulged out from the complicated instrument board, Mayer adjusted two purple-colored dials. Presently the transparent globe seemed to become alive with swirling lights and shadows. Out of the flickering confusion a remarkably life-like, three dimensional image in natural colors soon materialized.

A few seconds of careful scanning focussed the teleview on a clearing which nudged into the dense forest surrounding Lake Tolako. The image had hardly become distinct when Mayer uttered an exclamation which made both his space shipmates jump.

"What's the matter, Dan?" Sullivan gasped as he tumbled out of his hammock and, pulling himself hand over hand along the side rail, hurried to Mayer's side.

Captain Brink was a split-instant ahead of him.

"Something wrong?" he asked anxiously.

Mayer simply pointed at the objective of the teleview. That really wasn't necessary, for both the others were already staring at the crystal sphere, their eyes protuberant with horror.

In the spot where there should have been a picturesque village with happy men, women and children, working and playing among neat rows of hexagonal houses, the teleview revealed nothing but a desolation of smoldering embers, with which were jumbled hundreds of grotesquely sprawling bodies. Not a hut remained standing. Not a moving creature could be discerned.

Lieutenant Sullivan uttered a low oath in a tone which made it sound like a reverent prayer.

Ensign Mayer was silent, but the look of anguish, which distorted his handsome features, betrayed his feeling far more vividly than any words could have done.

Captain Brink was the only one of the trio who retained his normal composure. Speaking softly and gently, he said: "Excuse me, Dan. Better let me take the controls. You crawl into the hammock until you get a grip on yourself." Then to Sullivan he yelled: "Hi, Jimmy! You man the rocket brakes. We're going to set her down!"

So terrific was the speed of the spaceship that it took several minutes for the powerful rockets to decelerate the velocity sufficiently to make a safe landing possible. Meanwhile Captain Brink maneuvered the craft in a wide spiral. Finally he turned on the gravinul which nullified the gravitational attraction of the satellite just enough to enable him to set the huge flyer down as gently as a leaf falling on the bosom of the lake.

Leaving to Lieutenant Sullivan the task of guarding the spaceship, Brink quietly requested Mayer to accompany him in his inspection of the stricken village.

What they saw on the ground was infinitely more horrible than the images which the teleview revealed. Although the lifeless bodies which studded the blackened clearing were swollen and bloated, the two earthmen easily recognized the furry skins and rabbit-like ears of the native Ganymedians.

Totally unaccustomed to viewing sights as grewsome as this, Mayer was dismayed to feel himself becoming terribly nauseated. It was like space-sickness—almost the same sensation he had experienced on his first flight in the space-flyer. Nevertheless he forced himself to continue the search. He found the body of Lars Andersen, horribly mangled and mutilated, but of the missionary's daughter he could not discover a trace. When it became certain that her body was not among the victims, he hardly knew whether to hope or to despair.

"Well, Dan," Captain Brink muttered after the search had been completed. "The girl isn't here. That's certain."

"Then what could have— Where can—"

Brink took one look at his fellow officer's greenish-hued face and exclaimed: "Look here, man! You're sick! Better get back to the spaceship and lie down in your hammock."

"But—"

"Never mind any buts." Brink took Dan's arm and half led, half dragged him to the Hyperion.

"Let me go back," Mayer begged. "There must be some trace—some clue—"

"No doubt there is," Brink concurred. "But neither you nor I can find the clues and interpret them the way Jim can. He's the best puzzle-solver in the Solar System."

Turning to Sullivan, the Captain ordered: "Take a look around, will you, Jim. See if you can figure out what happened. Dan and I will stay in the ship."

CHAPTER II

The Space Marines Take a Hand

SULLIVAN was gone for nearly an hour. When he returned to the space-ship, Captain Brink sat down at the controls and hopped off. He waited until he had reached an altitude of twenty kilometers before he spoke. The question which he asked was a complimentary indication of his high regard for his lieutenant's deductive skill. It was not, "Did you find out anything?" His query was, "Who did it?"

Jim answered in one word—a proper noun. It was, "Zurek."

"Zurek?" Mayer echoed.

"Zurek is the Martian word for weasel," Brink explained. "It's a sort of title of affection which has been bestowed on a certain prominent public enemy of the solar system. He's an outlaw, wholesale murderer and general, all-around blackguard."

"But why did— What motive could he possibly have for perpetrating—" Mayer paused, groping for words which would adequately express his reprobation.

"His motive is plain enough," Sullivan volunteered. "Obviously it was a slaving expedition."

"How can you be so certain of that?" Dan challenged.

"Couldn't you figure that out for yourself?" Sullivan asked, a bit impatiently. "Didn't you notice that there were no young men or women and very few children among the corpses?"

"Now that you remind me, I do recall that most of the bodies were of

elderly people," Mayer acceeded. "I suppose you inferred from that circumstance that the younger people were taken away alive."

"What other inference could any intelligent person adopt?" Sullivan demanded.

"None," Dan had to admit. "But if this raid was perpetrated solely for the purpose of capturing slaves, why were all the weaklings and elderly persons tortured and killed?"

"Why does a weasel kill ten times as much game as it can possibly use for food?" was Sullivan's countering question. Without waiting for a reply, he went on: "There was a good reason why Zurek was christened the Weasel. His past record indicates that he is a super-sadist. He kills just for the fun of it. Probably gets a kick out of seeing his victims squirm."

"How horrible!" Dan exclaimed.

"Worse than horrible," Jim said. "It's unspeakable. You noticed of course that the bodies were bloated and mangled."

A look of anguish swept across Dan's handsome features and he closed his eyes as if to shut out the frightful sights which still haunted his memory.

"Yes," he almost whispered. "Some of them looked as if—as if they had exploded."

"Only a Martian electrolysis beam gun could have done that," Sullivan declared. "You've heard of them, of course."

"I've heard a little bit about those devilish contrivances, but I can't say I know much about them," Dan admitted. "Why do they call them electrolysis beam guns?"

"Because they shoot out a powerful beam which has an electrolytic action on fluids inside the bodies at which they are aimed. You can readily understand the terrible effect that would produce on a human body."

"You mean it changes the water in the blood into hydrogen and oxygen?"

"Precisely. The pressure of these gases on the walls of the veins and arteries produces frightful torture which lasts until it is ended by a terrible but merciful death."

Mayer uttered an exclamation of horror and said, "But I thought weapons like that were outlawed at the Interplanetary Humanitarian Conference away back in 2734."

"They were, but that wouldn't stop a skunk like Zurek from using them."

"Have you any other evidence that Zurek did this?" Dan asked.

"Plenty!" Sullivan told him. "Here! Take a look at these."

He unfolded his handkerchief and spread it out on the chart-table.

Mayer expected to see some startling clues, such as a weapon, a projectile or an article of jewelry. Instead, the opened handkerchief revealed only a chunk of grey dirt, a wrinkled scrap of colored paper and a piece of curiously bent wire.

WITH puckered brow and opened mouth, Dan stared at these insignificant-looking objects, but he made no comment.

"I found the place where the space-flyer landed," Sullivan explained. "It's about half a kilometer from the village. As you know, every rocket ship leaves distinctive marks in the soil when it takes off. The craft that brought the slavers to Ganymede was of Martian manufacture—a Krovenka to be exact."

"But that doesn't prove that the flyer was manned by Martians," Mayer reminded him. "The Krovenka" is a popular make. They are used all over the Solar System. I

even know several Terrestrials who own Krovenkas."

"True enough," Jim conceded. "Nevertheless I have strong reasons for believing that this particular Krovenka came here direct from Mars. Do you see this chunk of clay? I dug it up from the place where the soil was pressed down by the flyer's landing gear. What do you make of it?"

Mayer examined the dirt, shook his head and said: "I'm afraid it doesn't mean a thing to me. What do *you* make of it," Jim?"

"Notice these purple specks?" Sullivan said, pointing to the clod.

Dan nodded.

"Now feel them."

Mayer did as he was bid.

"Ouch!" he yelled. "They're like tiny splinters of glass."

"Precisely," Jim grinned. "It's a sand composed of eroded, basaltic rock. Observe the peculiar, purplish color. To me that spells Zurek."

"I don't get you yet," Mayer confessed.

"I know of only one place where sand like that is found, and that is in the Martian Desert of Menfol. Of course I haven't explored every remote corner of the solar system, but I have visited most of the spaceports. The only one I know of where purple, vitreous sand like this is found is at Menfol. You know of course that the knave's roost which Zurek presides over is located there."

"But how do you account for the presence of the purple sand in this chunk of mud?"

"Don't you understand? When Zurek took off from Menfol, some of the sharp particles stuck to his landing gear. The place where he grounded on Ganymede has a heavy clayey soil to which the sand adhered. That proves pretty plainly that the flyer came from Menfol."

"Granted. But even that doesn't positively implicate Zurek."

"Maybe not, but, combined with these other clues it does." He pointed to the fragment of paper and the twisted wire."

"Better elucidate," Dan grinned. "I never was any good at solving puzzles."

"This," Sullivan explained, "is a piece of the wrapper from a package of *vorgot*. It's a rare drug which is mixed with a substance resembling chicle and is chewed like chewing gum. I happen to know that Zurek is a vorgot addict."

Picking up the wire he added: "This thing-a-goop cinches it. Ever see one before?"

Dan shook his head.

"It's a beard clip," Sullivan told him. "Zurek takes great pride in his whiskers, you know. He plaits them very artistically. To keep them from unraveling, he clips the ends in place with jiggers like this."

He waited an instant to let this sink in, then he went on: "Individually, of course, none of these clues prove much, but when they are all integrated the answer is Zurek."

By this time, Captain Brink had gained enough altitude so that he could take his attention away from the controls for a while.

"Hey, Jim," he called. "If you're through with your lecture on how to become a great cosmic sleuth in six easy lessons, suppose you call the Colonel and turn in a preliminary report of the massacre."

"O.K., Chief!"

Sullivan adjusted a dial on his short distance visaphone, a small, flat object shaped like a cigarette case which was fastened to the straps of his

service belt where they crossed his chest.

"Calling Colonel Steiner, E.R.S.N.," he droned softly, "calling Colonel Steiner."

Presently a voice which seemed to come from within the space-flyer said, "Steiner answering!"

Floating without support in the center of the cabin, a marvelously life-like, three dimensional image of a human face appeared. It was the face of an old man, furrowed and weather-beaten; yet the eyes glowed with an alert, fresh vigor which is usually associated only with youth.

In succinct, crisp sentences, Sullivan described the finding of the ravished village and of his subsequent investigation. He ended with, "Any orders, Colonel?"

"None, other than the orders you already have received," the commanding officer replied. "I would like to have all three of you report to me as soon as you set your ship down at Headquarters Spacebase."

CHAPTER III

A Bold Proposal

HALF an hour later, when Brink, Sullivan and Mayer were seated about the steel-alloy desk in Colonel Steiner's simply furnished office, the Captain of the Hyperion furnished his commanding officer with the details which had been omitted from his lieutenant's visaphone report. To Sullivan he left the task of explaining the conclusions he had reached as a result of the investigation he had made at the scene of the massacre.

As the recital progressed, the expression on Colonel's stern but kindly face became graver and graver. When all the salient information had been transmitted to him, he shook his head and said: "How horrible! And the worst of it is that we can't do anything about it."

Mayer leaped to his feet, his face flushed with anger, and cried, "What do you mean, we can't do anything about it?"

Steiner stared at him in astonishment, but before he could utter a word of reproof, the Ensign, realizing that he had committed a flagrant breath of discipline, hastened to apologize: "Oh, I beg your pardon, sir! I forgot myself. Please forgive me."

Without speaking, Steiner turned his questioning eyes on Captain Brink as if in anticipation of the enlightenment, which the superior officer was ready to give him, concerning his associate's conduct.

"Ensign Mayer has been through a severe ordeal, Colonel," he explained. "You see he has a very special interest in Miss Andersen."

"Ah, now I begin to understand," the Colonel said in a sympathetic voice. Turning to Dan, he added, "I don't wonder that you are upset, Ensign Mayer. The mere thought of a loved one being in the power of a fiend like Zurek is enough to make any red-blooded Terrestrial forget himself. Unfortunately, however, as I said before, there is nothing we can do about it."

"But, surely, Colonel—if you will pardon my saying so, sir—there must be some way to save her from this unspeakable Martian. Ingeborg Andersen is a citizen of the Earth Republic. Furthermore, she is a Christian Missionary. Can there be any doubt about these two statements, sir?"

"Of course not, my boy. And may I suggest that it is not necessary for

you to shout. I can hear you perfectly well if you speak in an ordinary voice."

"Please pardon me, sir," Mayer apologized. "What I am trying to get at is this: When I received my commission I was told that it was the duty of the Earth Republic Space Navy to safeguard the life and liberty of every Earth Republic citizen and every Christian—no matter where he or she might be in the Universe. Am I not right, therefore, in declaring that it is our duty to do everything in our power to save Miss Andersen from her abductors?"

"Of course you are right," the Colonel admitted. "But even the Space Navy cannot achieve the impossible."

"Again asking your pardon, sir; but it is hardly necessary to remind Colonel Alexander that the Space Marines are famous for accomplishing tasks which at the outset seemed impossible."

"True enough," Steiner conceded. "But in this case the obstacles are of much more formidable and serious character than we have ever previously encountered. Before I amplify this statement I must caution all of you that everything said here must be kept in strictest confidence."

The three younger officers nodded and Steiner went on, "There are strong reasons for believing that the military leaders of Mars are deliberately planning to invade certain of the more desirable portions of the Earth Republic for the purpose of annexation and colonization. Mars is ready right now—spoiling to start hostilities. For fear of incurring the enmity of Venus and the other states of the Solar System, Mars doesn't dare to employ the usual, ruthless, Martian system of attacking without warning and without reason. For some time they have been looking for an excuse to start hostilities. They know that the earth is not prepared for war now, but that our scientists and our manufacturers are quickly building up defensive armaments. Hence, from the standpoint of Mars, it is imperative that the excuse to declare war shall be found as soon as possible. In the interests of the Earth Republic it is equally vital that no such excuse shall be created. That's why it is particularly important that the E. R. Space Navy shall watch their space flights even more carefully than ever. Do I make myself clear?"

"Yes, but—" Mayer started to say.

He was interrupted by Sullivan, who said: "Pardon me, Dan. I suppose you heard what happened to Cummings and Lindskov and Christopher just a few days ago."

"All I know is that they went on a secret mission and never came back," Mayer answered.

"They were caught by Martian Intelligence Officers," Colonel Steiner told him. "The detectives claimed that they found motion pictures of the new Martian Spacedreadnaughts in the possession of Cummings. The other two were implicated as his assistants. All three of them were summarily executed—after the customary Martian session of refined torture, of course."

"What an unspeakable outrage!" Mayer exclaimed. "They must have been innocent. Officers of the Space Navy are not spies!"

"Don't be so sure of that," Steiner contradicted him. "It happens that Cummings and Lindskov and Christopher were sent on a special mission, and that mission—to use a plain, ugly word—was espionage. This, of course, had to be denied by the E. R. S. N. staff and by the Earth Republic Am-

bassadors to Mars. But they didn't fool the Martians. Orders were subsequently issued that no Earth Republic rocket ships would be permitted to land on Martian soil. It is generally understood that any member of the E. R. Space Navy who gets caught on Mars will be summarily tortured and put to death without even the formality of a trial. Do you understand now why there is no possibility of our sending an expedition to save Miss Andersen?"

Instead of answering this question, Mayer asked another one: "You think that Zurek will take Miss Andersen to Mars?"

"Yes," Steiner affirmed. "In consideration of the facts brought out in Lieutenant Sullivan's report, there can be little doubt of that. Unquestionably the purpose of the raid was to capture slaves. There is only one place in the Solar System where public barter of slaves is condoned, and that is on Mars."

"But isn't there a possibility that we could overtake and apprehend Zurek before he reaches Mars?"

The Colonel smiled tolerantly and said: "I don't think you would make a suggestion of that sort if you stopped to reason it out intelligently. You must know, for instance, that the mere task of locating Zurek's flyer would be like hunting for a champagne cork floating in the middle of the Pacific Ocean. I won't say that it is absolutely impossible, but unless we were miraculously lucky it would take so much time to find him, that Zurek would be safe at home before we could even commence to pursue him."

He stopped for a moment to light his pipe, and then went on: "Even if we knew exactly where Zurek is right now, I'm afraid we wouldn't have a chance to overtake him. To be sure, the Hyperion is a trifle faster than his Krovenka, but it isn't nearly speedy enough to overcome the enormous head start which he already must have. You realize this, do you not?"

"Yes, Sir," Mayer had to admit. "But—" He couldn't think of any way to end the sentence.

After a polite pause, Steiner continued: "Suppose a miracle—or rather two successive miracles—did happen. Suppose we located Zurek and caught up with him before he landed on Mars—what could we do about it?"

Mayer opened his mouth but said nothing.

"I see you understand the situation," the Colonel observed. "We couldn't force Zurek to heave-to, without threatening to blast his ship. With Miss Andersen and the captured Ganymedians aboard, Zurek would know we wouldn't dare to do that. On the other hand, he wouldn't hesitate about using his beam projectors against the Hyperion. Do you understand now how suicidal such a chase would be?"

Mayer could only nod his head sadly.

For a moment or two no one spoke, then Captain Brink said: "Do you mind if I make a suggestion, Colonel Steiner?"

"Please do."

"In view of the fact that we have just completed a successful mission, I believe we are entitled to a leave of absence. Am I right?"

"Most certainly," the Colonel agreed. "All three of you have earned vacations. How long would you like to be off duty?"

"That will be hard to predict," Brink replied. "My idea is this: Whereas it is obviously unfeasible

for us to visit Mars as representatives of the Space Navy, I see no reason why we cannot tackle this job—well, let us say—unofficially."

"Just what do you have in mind, Captain Brink?"

"What's to prevent us from organizing a free-lance expedition to attempt the rescue of Miss Andersen?" Without waiting for an answer to this question, Brink hurried on: "I would like very much to command such an expedition. From what Ensign Mayer has just said, I take it for granted that he will be willing to accompany me. How about you, Jim?"

Sullivan's bronzed countenance lighted up with joyous anticipation and he said: "You know me, Chief. Whenever there's a chance for solving a mystery and getting into a good scrap, you can always count me in."

"But what will you do for transportation?" Colonel Steiner demanded. "You must realize of course that you would not be permitted to use the Hyperion or any of the other E. R. S. N. flyers. If one of our spaceships—all of which are known to the Martians—were to land on Mars it would give them the excuse they are looking for and they would immediately declare war on the Earth."

"I realize that completely," Brink assured him. "I wasn't planning to use one of the Space Navy ships. Doubtless you already know that for over a year Lieutenant Sullivan and I have been devoting our spare time to the construction of an improved type of spaceship."

Steiner smiled and said: "I have heard something about your off-duty activities of course. As you know, I gave orders that all your requisitions for materials and labor should be honored."

"For which we have been very grateful," Brink thanked him. "Perhaps you do not know that our new ship is now ready. It embodies several unique improvements and added features which are not found in the spaceships of standard design. We have decided to call it the 'Cosmicraft.' Jim and I are itching to try it out. Perhaps this will be a good opportunity to put it through its paces."

"Perhaps," the Colonel half agreed.

"Then you will give your consent?" Brink asked. "You will allow us to go on this free-lance expedition?"

"You realize, do you not, that this expedition as you call it will be the most dangerous mission you have ever undertaken?" Steiner hedged.

"I realize that fully," Brink told him. "And that makes me even more anxious to tackle it. Unless I am deluding myself, I have every reason to believe that Jim and Dan feel the same way about this great adventure. What is your verdict, Sir? May we go?"

"With my blessing," the Colonel acceded.

CHAPTER IV

The Invisible Spaceship

FOR a tense period of sleepless watchfulness—which according to their recording chronometers, corresponded to about five earth-days, the three spacefarers blasted their way through that perilous merry-go-round of cosmic junk known as "the zone of asteroids," which made the region between Jupiter and Mars a nightmare for spaceflyers.

As they neared the end of their three hundred and fifty million mile journey, the course of the Cosmicraft was regulated in such a way that the planet Mars was directly between them and the center of the sun. At

first it was just a black speck, almost imperceptible against the dazzling solar glare. Like a toy balloon being inflated, it grew with amazing rapidity until it eclipsed the sun except for the stupendous, writhing tongues of flame which made up the solar corona.

Once, as he bent over the space chart, tracing the line which indicated the path of the ship during the previous twelve hours, Ensign Mayer said: "Excuse me, Captain Brink, but it looks to me as if we have gone nearly a million miles out of our way. Couldn't we reach our destination sooner if we steered toward the location where Mars will be when we get there, rather than pointing our nose exactly at the point where it is now?"

"That's correct," Brink agreed. "We would get there a bit sooner, but not nearly so safely. You mustn't forget that, with interplanetary relations seriously strained as they are at present, the military observers of Mars will keep a constant lookout for alien spaceships. By keeping in the shadow of the planet we have a much better chance of frustrating their vigilance."

"Ah, now I understand the reason for our seemingly erratic course," Mayer responded. "But how about our rocket discharges? Aren't they more easily seen at night than in the daytime?"

"Undoubtedly," the captain admitted. "But that's a risk we cannot avoid completely. At our present distance from Mars, our exhaust flames are visible from the planet only through powerful televiews. The only likelihood of detection is that some astronomer might just happen to point his instrument in our direction. And even if he did, he could easily mistake us for a meteor. As soon as we are close enough to be seen by the naked eye, we shall turn off the braking rockets we are using now and rely on our gravitation nullifiers to retard our speed and set us down safely."

"But how shall we conceal ourselves after we land?" Mayer asked. "There aren't any forests or thickets on Mars are there?"

"No," Brink affirmed. "The only vegetation that can exist on Mars consists of cultivated grains and native vines which would not offer any cover for even the tiniest of flyers."

"I suppose your plan is to keep shifting the position of the Cosmicraft so it will always be on the night side of the planet," Mayer suggested.

"No," the Captain responded. "That wouldn't be at all feasible. Fortunately we don't have to worry so very much about the Cosmicraft being discovered after we land on Mars. Thanks to a very ingenious device which was invented by a spalpeen named Jimmy Sullivan, the Cosmicraft can virtually be made invisible when it is resting on the ground." Calling out to Lieutenant Sullivan, who was at the controls, Brink said: "Take a couple of bows, Jimmy."

Sullivan took his eyes off the instrument board just long enough to glance over his shoulder and say: "What do you want me to bow for?"

"The Chief has been telling me about your wonderful invention," Mayer explained.

"Which one?" Jimmy asked, "I have so many wonderful inventions to my credit."

"You shouldn't be so modest about them," Captain Brink laughed. "The one we were talking about is the invisibility device."

"Yes," said Mayer, shifting his position so that Sullivan could talk to

him without turning his head away from the control board. "Won't you tell me how your new invisibility gimmick works."

"It's really not new," Sullivan told him. "I just borrowed the idea from nature. For millions of years it has been used by animals."

"Nevertheless, I'm still interested in learning about it," Mayer grinned.

"A. Z." Sullivan rejoined. "But before I explain it to you, let me ask you a question or two."

"Proceed," Mayer agreed.

"Suppose you were to tackle the job of making something like this ship invisible, how would you try to do it?"

"There are two possible ways of accomplishing that," Mayer replied. "One of them is by making the ship absolutely transparent."

Sullivan sniffed and said: "You must have been reading that ancient yarn called 'The Invisible Man.' That was an entertaining story, but of course you realize that such a fantasy as that is absolutely impossible from a scientific point of view. You must understand that to apply any such principle as that, you would not only have to make every portion of your space ship but also everything in it, including the crew, absolutely transparent."

CAPTAIN BRINK, who had listened with an amused smile on his face, supplemented Sullivan's remarks with: "And even if you did succeed in making the ship and all its contents completely transparent, it would still be clearly visible. You must know that a glass statue, for instance is nearly as easy to distinguish as a marble one."

"True enough," Mayer conceded, "But that is because the index of refraction between glass and air is about one and five-tenths. Now if the optical density of the space ship and all the things inside it were exactly the same as the optical density of air, there would be no refraction and hence our flyer would be invisible."

"That's a mighty big 'if,'" Captain Brink grinned. "But then, we've seen plenty of mighty big 'ifs' which have subsequently become realities. So, suppose we assume that your flyer and its contents have exactly the same optical density of air—And, by the way, just what air do you mean? The optical density of air on Mars is much less than that on the earth, and the atmosphere of Ganymede has a still lower index. Then again, the optical density of the atmosphere surrounding any particular planet or satellite varies considerably with the altitude. You get my point, don't you? In order to make your idea practicable you would have to devise some method of altering the optical density of your object to conform with its environment at any particular moment."

"Aw, skip it," Mayer laughed. "I didn't think so much of that idea myself. But I have another scheme for making objects invisible which perhaps is more practical."

"A. Z." said Sullivan. "Let's hear about it."

"As we all know," Mayer began. "Objects are visible to us only because of light which is reflected from their surfaces. Now if we could cover our spaceship with a special kind of paint or other coating which is absolutely black—so that it would absorb one hundred per cent of the light which fell upon it and would reflect no light whatsoever, then our flyer would become invisible."

"Now you're getting a bit warmer," Sullivan praised him. "That idea is

much more feasible than the other one, but even it has a very serious flaw."

"What is that?" Mayer asked.

"Can't you figure that out for yourself?" said the lieutenant. "If no light whatever is reflected from your ship, it will create the illusion of nothingness—sure! But that wouldn't necessarily make it invisible. On the contrary, it might make it even more conspicuous than it would be normally."

"Why so?" Dan demanded.

"Simply because it would obscure everything that happened to be in back of it. In other words, it would look like a great big hole in the landscape—a hole that would be shaped exactly like the outlines of the ship and would offer a target that a beam-gunner couldn't possibly miss."

"A. Z." Mayer grinned. "I give up. As an inventor, I seem to be a nadir. Suppose you tell me the answer."

"As I hinted a moment ago," Sullivan reminded him, "Mother Nature gave us the answer several million years ago. Did you ever hear of what zoologists call 'animal mimicry?' "

"Of course," Mayer responded. "Like the chameleon, you mean."

"The chameleon has had a lot of publicity," Sullivan rejoined. "Perhaps that age old anecdote about the chameleon who perished while trying to make good on a Scotchman's plaid kilt had something to do with its reputation for being a camouflage expert. As a matter of fact, however, there are several creatures which can give effacement lessons to the chameleon."

"For instance?" Dan prompted him.

"Well, take flatfishes, for instance, like the plaice and the sole. They have such a remarkable faculty for adjusting the color pattern of their upper surfaces to conform with the surrounding mud or sand that it is difficult to find one, even when you know exactly where it is. The Aesop prawn, Hippolyte, has an even more remarkable ability to make itself invisible. It becomes brown on brown seaweed, green on sea lettuce, red on red seaweed and so forth. At night it turns blue, and, when daybreak arrives, it again assumes the color of the vegetation on which it rests."

"I wonder how they do it," Mayer interposed.

"Scientists discovered that a long while ago," Sullivan informed him. "The adjustment of color and pattern is due to changes in the size and shape and position of mobile pigment-cells, called chromatophores, in the skin. This must be controlled by the color of light which falls on the fish's eyes. We know this because when a flat-fish becomes blind it loses its power to change its coloring."

"Do chameleons use the same system?" Mayer inquired.

"Not exactly. Experiments have shown that the changes in coloring of chameleons depends partly on the contraction and expansion of the color cells or chromatophores in the under skin and partly on close-packed refractive granules and crystals of a waste product called guanin."

"That's interesting," said Dan. "But I don't see how you are going to coat your space ship with the skins of flat-fishes and chameleons."

Sullivan laughed and rejoined, "No but we can produce a similar effect scientifically—in fact we can actually improve on the system employed by the chameleons and prawns."

"Yes, yes, go on!" the younger man urged him.

"My system is a sort of automatic camouflage," the lieutenant continued. "The outer shell of the Cosmicraft is studded with scanning devices which are hooked up in such a manner that

they produce on the opposite side of the ship a series of overlapping images. You can look at the ship from any direction and you will see only a composite, naturally colored image of whatever happens to be directly behind it. This image fills in a faithful reproduction of that portion of the surroundings which normally would be obscured by the hull, and the craft itself becomes completely invisible."

"Now I comprehend," Mayer said. "But does it actually work?"

"Of course it works, you Goop," Sullivan snorted. "You don't suppose I'd install a device like that on the Cosmicraft without first testing it very thoroughly do you?"

"Excuse me for asking," Mayer apologized.

"Oh, that's A. Z., kid. As a matter of fact, the scheme doesn't work as well as I'd like it to," Sullivan amended this previous statement. "When you get up really close to it, the illusion is far from perfect. However, at a distance of twenty-five meters or more it functions very satisfactorily. And, since it is extremely unlikely that anyone will come any closer to us than that while we are hiding on Mars, it ought to serve—"

He was interrupted by Captain Brink, who said quietly: "Excuse me for cutting into this learned dissertation, Jimmy, but don't you think you had better get ready to land."

"A. Z., Chief," Sullivan grinned.

CHAPTER V

Into the Weasel's Lair

WITH that uncanny skill which comes only from many years of experience as a space navigator, Captain Brink set the Cosmicraft down in the Martian desert of Menfol, about half a kilometer from the sinister fester of shacks which constituted Zurek's nest of blackguards.

After a brief conference it was decided that Sullivan, who understood the Martian language perfectly, should steal into Zurek's village and endeavor to find out what had happened to the slaves who had recently been captured in Ganymede.

As he was about to depart, Captain Brink said: "Just a minute, Jim. After you have completed your intelligence job, how are you going to find your way back to the Cosmicraft?"

"Zee!" Sullivan exclaimed. "Glad you reminded me of that! I'd have a sour time, wouldn't I, hunting all over Mars for an invisible spaceship."

"Why not use a thread?" Mayer suggested.

"A thread? I'm afraid I don't integrate with you."

"Don't you remember the yarn—"

Before he could go any further, Sullivan interrupted him with: "Yarn? I thought you said thread."

"I did, you goop. I got the idea from a yarn I read about a mythological hero who found his way out of a maze by unwinding a spool of thread."

"Now that's a sizzling idea," Sullivan sniffed. "The only trouble is that we don't happen to have any thread aboard—unless you took your sewing basket along."

"You might use wire instead of thread," Mayer persisted.

"Yes. I might if we had a few hundred meters of wire. Any amount under half a kilometer would be worthless for the purpose. I suppose your next suggestion will be that I scatter bread crumbs along the trail like Hans and Gretel did in the ancient fairy tale."

"Perhaps you have a better idea," Mayer pouted.

"Perhaps I have," the lieutenant rejoined. "We must use some sort of signal to be repeated at regular intervals."

"Surely you can't mean flashes of light or anything like that," Mayer said.

"Certainly not. Anything visible would betray our presence to the Martians. What I have in mind is a sound of some sort—something which might be heard here under normal conditions—something loud enough and distinctive enough to be recognized at a distance."

Sullivan knitted his brows for a moment or two and then exclaimed: "I have it! A jackant!"

"And what in cosmos is a jackant?" Mayer wanted to know.

"If you want that question answered, put on your thermal suit and come outside with me."

Sullivan was already attired in the electrically heated costume which earth-folk usually wore for protection against the bitter, nocturnal frigidity of the planet Mars. Responding to Sullivan's suggestion, Mayer put on his thermal suit and followed the lieutenant into the airlock.

"Is it really necessary to use the airlock?" he asked Sullivan.

"Not necessary but advisable," the older man told him. "Making our exit this way will enable us to conserve both the warmth and the pressure of the air inside the spaceship."

When the outer port was opened, Mayer felt a sudden chill which, in spite of his heated garment, made his teeth chatter. He also discovered that the atmosphere was distressingly rarefied. In order to supply his oxygen-hungry lungs with sufficient air he had to breathe furiously, like a runner at the end of a ten kilometer race.

"Listen," he heard his companion pant.

Mayer listened. For a while he could distinguish only the sound of his own breath as it hissed in and out of his distended nostrils. Then, from a remote portion of the desert a startling cry was wafted to him. It was a weird, eerie conglomeration of chirping, howling and braying.

"What in the galaxy is that?" he asked in a labored whisper.

"A jackant," Sullivan told him.

"A what?"

"A jackant, you gink. Surely you must know what a jackant is. There's a pair of them in the International Zoological Gardens at Rome."

"Never been there," Mayer admitted. "Is it a bird, or beast or a bug?"

"Don't ask me—I'm no authority on Martian zoology. The Jackant has six legs like a bug and feathers like a bird but it suckles its young like a mammal—so take your choice."

"How big is it?"

"About the size of an Airdale dog. There goes another one—hear it?"

"Of course I hear it. Do you think I'm deaf?"

Ignoring this impertinent question, Sullivan said: "They tell me you are pretty good at impersonations. Let's hear you imitate a jackant."

Obligingly Mayer threw back his head and uttered a cry: "Chir-r-r-ak—ow-w—w-yaw-gee-yaw!"

It was so loud and penetrating that Captain Brink heard it through the insulated shell of the Cosmicraft. His face appeared at the observation port which was closest to the airlock. The expression of surprise on his countenance made Sullivan chuckle.

"Cosmilossal!" he exclaimed, giving Mayer a slap on the back which

nearly felled him. "If you had feathers and four more legs you could impersonate a jackant to perfection."

"Thanks," Mayer coughed. "But what's the idea of asking me to make a jackant of myself?"

"Can't you assimilate that? The jackant call will be our signal."

"You mean you want me to imitate a jackant to guide you back to the spaceship?"

"That's the idea precisely, my lad. Sometimes you display intelligence that is almost human. Now, be sure to get this straight, young fellow: After I've been gone about an hour or so, you are to come outside about once every ten minutes and give five or six calls like the one you just perpetrated. All I'll have to do will be to travel in the direction of the sound. Do you integrate?"

Mayer nodded and said: "I check with you. Don't worry, you can depend on me."

"A. Z., Dan, me lad. So long!"

With the enormous, springy strides which were made possible by the low gravitational attraction of Mars, Lieutenant Sullivan quickly disappeared in the darkness.

CHAPTER VI

The War God's Chariot Steeds

WHEN Mayer reentered the spaceship, Captain Brink was making entries in the log book. Briefly the ensign told his chief about the system of signaling which he and Sullivan had agreed to use.

Brink shook his head grimly.

"What's the matter, Chief?" Mayer asked anxiously. "Anything wrong?"

"I hope not," Brink replied. "But I wish you had consulted me first."

"Does that mean we have made a mistake—that our signals won't work?"

"That remains to be seen. And since it's too late to change the plan, there's no use in discussing it any further. Meanwhile, it looks like you have a long night's work ahead of you, so I suggest that you snatch a bit of sleep."

"I really don't feel like sleeping, Chief. This is my first night on Mars. If you don't mind, I'd like to sit up and look at the scenery. I think it's beautiful."

"Beautiful, my gravinul!" Brink snorted. "I can't see anything beautiful about the landscape of Mars. No trees. No mountains. No oceans, lakes or rivers. Nothing but bleak, arid plains and stagnant marshes overgrown with obnoxious, crawling vines."

"I wasn't thinking of the landscapes," said Mayer. "What intrigues me is the sky. Just look at it! How large and brilliant the stars are tonight."

"That's because the atmosphere is rarefied and cloudless," the captain informed him.

"Yes. And look at those two moons. How in the world did they get such outlandish names as Phobos and Deimos? Let me see. Phobos means *fear* and Deimos means *flight*. Isn't that right?"

Brink nodded.

"But why give such frightful, flighty names to a couple of lovely satellites?" Mayer wanted to know.

With an amused grin playing about his firm, thin lips, the captain said: "Apparently you know more about philology than you do about ancient mythology. For your edification permit me to inform you that Phobos and Deimos were the names of the horses

which provided the motive power for the chariot of Mars, the war god."

"Which is which?" Mayer asked.

"The one that looks about the size of a tennis ball is Phobos," Brink told him. "Deimos is the one that makes you think of a marble."

"I expected them to look bigger and brighter than that," Mayer remarked. "They are both quite close to Mars aren't they?"

To which the older man replied, "That's correct. Phobos is only 5,826 miles from the center of Mars, Deimos is 14,600 miles away—about six one hundreths of the distance between the Earth and Luna."

"They must be awfully small," was Mayer's comment.

"Deimos is about five miles in diameter. Phobos is approximately ten miles across. The apparent diameter of Deimos is about one-fifteenth that of Luna and Phobos, looks as if its diameter is about one-fourth the diameter of the earth's moon. The reason that they are relatively less brilliant than Luna is that they are nearly fifty million miles further away from the sun. The light reflected by Deimos is about 500 times as weak as that of Luna."

"Even if the chariot horses of Mars are smaller and less brilliant than our Earth-moon, I still think they are beautiful," Mayer rejoined. "You don't mind if I watch them, do you?"

"Watch them until you're looney for all I care," the Captain grumbled and went on with his work.

After a few minutes of silence, Mayer said: "Excuse me, Chief."

"Yes?" was the patient response.

"Those two moons, Deimos and Phobos, seem to be getting closer to each other."

"Naturally," Captain Brink answered gruffly. "They can't very well help it."

"But—"

"Don't you understand? They are revolving around Mars in opposite directions. Phobos rises in the west and sets in the east, and it takes only eleven hours to circumnavigate the planet. Deimos rises in the east. It takes 132 hours to complete its diurnal circuit—if that means anything to you."

"Thank you Chief. But how in the universe can Phobos behave in such an erratic, backward manner. I thought every satellite had to revolve in the same direction as the rotation of the mother planet."

"Most satellites do," Brink conceded. "But there are other exceptions. Since we are stationed in Ganymede, you should know that both the eighth and ninth moons of Jupiter have retrograde motions. Phoebe, the outermost satellite of Saturn, also moves in the opposite direction from the other moons. This erratic behavior, as you call it is usually explained by the theory that the moons with retrograde motions were originally independent asteroids which wandered afar and were captured by their respective planets."

"Sounds reasonable," Mayer rejoined. "Much obliged for the lesson in astronomy."

AS Mayer continued to watch the heavenly chariot steeds he was somewhat surprised to see the round disc of Phobos shrink to a lovely, miniature crescent, while the orb of Deimos which previously had been shaped like a distorted eclipse became almost full.

He was interrupted in his observations by the half stern, half good humored voice of Captain Brink:

"Pardon me, Ensign Mayer. But if you don't mind discontinuing your moon gazing for a few minutes, I suggest that it might not be a bad idea for you to start signalling to Jimmy."

"A. Z., Chief," Mayer grinned sheepishly as he reached for his thermal suit.

Going out through the airlock, he walked to the prow of the Cosmicraft and broadcasted the agreed signal, repeating it several times. During the intervals between his imitations of the jackant's cry, he could hear them being answered by the genuine calls of these strange creatures.

Returning to the warmth of the spaceship's interior, he discovered that Captain Brink had retired to his sleeping hammock. His deep, stertorous breathing indicated that he was already slumbering soundly.

The hours which followed were far from pleasant to Daniel Mayer. Again and again he repeated the jackant's raucous yell. Again and again he tried without success to penetrate the surrounding darkness with the spaceship's teleview. Again and again he listened with bated breath for the sound of approaching footsteps or for some other noise to indicate that his pal was either safe or a captive.

Finally, when a faint glow in the east gave warning of approaching false dawn, Mayer, no longer able to endure his lonely vigil, decided to awaken Captain Brink.

"What shall we do, Chief?" He said in an anxious voice. "Jimmy hasn't returned yet, and it's almost dawn."

Captain Brink rubbed his eyes, stretched himself and yawned: "Don't worry about Jimmy. He knows how to look after himself."

"But it's almost time for the sun to rise. If he doesn't find us within the next few minutes, he is certain to be discovered."

"I was afraid something like this would happen," Captain Brink muttered. "Have you tried to locate him with the teleview?"

"Yes. But it's been too dark to distinguish anything. Perhaps now—with the faint light of approaching dawn to help—"

Mayer left his sentence hanging in midair, for Captain Brink was already seated before the objective of the teleview.

After ten minutes of rapid scanning and focusing, he exclaimed: "By Jupiter! I believe I see something moving. But how in Hyperion did he get away out there?"

"Where?" Mayer asked in a sepulchral whisper.

"Over there, away the other side of the slavers' village and about fifteen degrees to the north of it. Don't you see him?"

"Darned if I can," Mayer admitted.

"He just ducked behind a little sandhill. That's Jimmy all right."

"But if you can see him, isn't he liable to be discovered by the slavers?"

Brink evaded answering the question directly by saying: "There isn't much cover out there, but, such as it is, Jimmy knows how to take full advantage of it."

"Shall I go out and give the jackant call again?" Mayer asked.

"No," Captain Brink replied. "It is quite obvious that your signals have confused him instead of helping him. Get ready to take off."

Before Mayer had time to utter another word, Captain Brink turned a dial on the control board and the

avinul began to whine. Slowly, and quietly, like a big balloon, the Cosmicraft rose in the air.

"You're not going to turn on the rockets are you, Chief?" Mayer whispered.

"Certainly not. That would give us away for certain."

"Then how—"

Somewhat impatiently Brink said: "We're going to drift. And if you want to help, please quit asking foolish questions and pray that what little breeze there is stirring will carry us in the direction we want to go."

Whether it was because of Dan's prayers or just the good luck which usually assists those who strive valiantly to help themselves, the Cosmicraft began to float in the direction of the slavers' village. It was still too dark for the unaided eyes to distinguish objects clearly, but, thanks to the amplifying effects of the teleview, Captain Brink was able to set the craft down within a few meters of Lieutenant Sullivan's crouching form. He took care to have the hull of the spaceship between the village and the earthman.

Opening the airlock on the side of the ship which was turned away from the slavers' lair, Brink crawled stealthily out and guided Sullivan back to the Cosmicraft.

Within the protection of the invisible spaceship, Mayer embraced his pal warmly and said: "What was the trouble, Jimmy? Wasn't my imitation of the jackant's call good enough?"

"It was too darn good," Sullivan growled. "I couldn't distinguish your imitations from the genuine article. All night long, I've been chasing jackants all over the desert of Menfoll"

CHAPTER VI

The Wok Stables on Mars

CAPTAIN BRINK laughed uproariously but Mayer didn't even smile. In a voice that trembled with anxiety, he asked: "Tell me, Jimmy, did you find out anything?"

"What a question to ask the greatest cosmic sleuth in the Galactic System," Captain Brink chuckled. "Of course he found out something. Where is Miss Andersen, Jimmy?"

"She's somewhere near Vanrab. Zurek sold her to the dairy farm there. She probably is being forced to herd and milk woks."

"What on Mars are woks?" Mayer wanted to know.

"You tell him, Frank," Sullivan said. "I'm afraid I'm not much good at teaching kindergarten."

Captain Brink grinned and explained, "Wok is the Martian name for a species of dairy cattle. The brutes have never been thoroughly domesticated. They are half wild and unspeakably filthy. The work of herding them and milking them is so odious and so hazardous that no free-born Martian can be hired to do it, no matter how high the wages may be. That is one reason why there is such an active market for slaves here on Mars. I understand that very few of the slaves who are forced to do this work live for more than a few months after they are drafted into the wok stables."

"How horrible!" Mayer exclaimed. Then, turning to Sullivan, he asked: "Are you sure Miss Andersen is at Vanrab?"

"Nothing is absolutely certain," Sullivan hedged. "But I'm sure enough to give you odds of ten to one if you

feel like placing a bet that she isn't there."

Ignoring the challenge, Dan demanded: "How did you find out all this?"

"Merely by keeping my ears open," Jimmy told him. "I can understand the Martian language as well as I can Terrestrial—better in fact than some of the so-called Earth-lingo that I sometimes hear masquerading as the mother-tongue. These Martian blackguards are notoriously voluble and loudmouthed. All I had to do was listen long enough and I got the whole story. As the mythological detective of yore used to say—it's elementary, my dear Watson—quite elementary."

While his two assistants were talking, Captain Brink had been preparing the Cosmicraft for flight.

"A. Z. for the take-off," he said quietly and the next instant the spaceship was in the air. A few minutes later it alighted in a marsh about half a kilometer from the wok stables at Vanrab.

"It's up to you to figure out a plan for rescuing Miss Andersen, Jimmy," Captain Brink ordered. "Take Dan with you. I'll stay here and guard the Cosmicraft. It will soon be daylight so you'll have to work fast."

"A. Z., Chief," Sullivan responded as he handed Mayer a mysterious bundle without giving him any inkling of its contents. "Come on, Dan. Let's get going."

As they entered the airlock, Captain Brink called to them: "Just a minute, boys. Haven't you forgotten something?"

"I don't think so, Chief," was Sullivan's confident reply.

"How are you going to find your way back to the Cosmicraft?" Brink asked.

"Oh, I have that all figured out," Sullivan told him. With a sly glance at Mayer, he added, "This time—with your kind permission—I shall depend entirely on my own resources. My method will be quite elementary. I shall blaze the trail with a radium pencil. Any objections, Chief?"

Brink countered with another question: "Are you sure that will be safe?"

"Why not?"

"Suppose one of the Martains—or a party of them—sees the luminous marks and follows them to the space ship?"

"I've thought of that too. I intend to place the marks on this side of the rocks along the trail so they will be visible only from the direction of the desert. It is very unlikely that any Martians would approach from that direction."

"A. Z., Jim," Captain Brink smiled. "Good bye and good hunting!"

BY this time it was almost daybreak, and the advance rays of the approaching sun were beginning to paint the dust-laden atmosphere of Mars with faint but grotesque streaks of color. Although no sign of life had yet appeared in the vicinity of the wok stables, the two space marines approaches their goal with prudent caution, taking full advantage of the scanty cover which was afforded by the rocks and sand dunes along the route.

There was no Martian sentry on guard. Since everyone—including the slaves themselves—knew positively that escape was impossible, night guards were considered superfluous. Consequently Sullivan and Mayer were able to enter the slave barracks adjacent to the stables without the slightest difficulty. Both of them were prepared to witness scenes of horror and degradation, but what they ac-

tually saw was far worse than their direst expectations. Huddled together amid unspeakable filth, like pigs in the stock pens of a space-freighter, were several hundred miserable creatures who looked and behaved and smelled more like animals than like human beings. Most of the slaves were slumbering but their pain-seared faces and cramp-twisted bodies showed clearly that even in sleep they were suffering the torments of cold, hunger and disease.

In addition to being fetidly noisesome, the place was unpleasantly noisy. From all directions came moans and hisses and snorts which were more beastly than human. One snore in particular boomed forth with such cacophonous resonance that it seemed to stand out from all the others like a tuba solo in an orchestra of bagpipes.

Grasping Mayer's wrist, Lieutenant Sullivan whispered: "Listen to that snore, Dan."

"I can hear it without listening," Mayer replied as he clapped his heavily gloved hands over his ears.

"It sounds familiar," Sullivan insisted. "I'm sure I have heard that snore somewhere before."

"And you may be equally certain that there couldn't be another like it in the universe," Mayer assured him.

"That's just what I'm athinking," Sullivan agreed as he waded through the muck and straw, trying with difficulty to avoid stepping on the human rubbish which encumbered the filthy floor. At one of the recumbant figures he kneeled, bringing his eyes close to the sleeper's face in an effort to penetrate the semi-darkness.

Looking up at Mayer, Sullivan whispered: "It's he, A. Z."

"Who is it?" Dan asked softly.

"Captain Hawkins. He's a space marine. Disappeared from Ganymede about two months ago. Suspected of deserting, but all his friends, including myself, knew better. Looks like this is a break for us as well as for him." And he shook the sleeper roughly.

No response.

Bringing his mouth close to the man's ear, Sullivan commanded: "Wake up, Al! Wake up!"

Still the captain continued to snore.

Finally Sullivan clapped his right palm over the sleeper's mouth, while with his left hand he squeezed his nostrils, thus shutting off his breath.

With a noise which resembled the gurgle of a love-sick sea-lion, Captain Hawkins awoke and sat up.

"Sh-h-h" Lieutenant Sullivan cautioned him. "You know me, Al. I'm Jimmy Sullivan come to save you from this vile hole."

With the sort of inflections he might have used in a fashionable drawing room, Hawkins said: "Lieutenant James Sullivan! Fawncy meeting you here, of all places."

Thumping him affectionately on his rag-clad back, Sullivan exclaimed: "You're the same old Al, I see. Now listen to me closely and work fast, for there isn't a second to lose. Pick out four or five Earthmen whom you know you can trust. Wake them at once and bring them over to the northwest corner of the building—the one furthest from the door. I'll tell them what to do."

When they reached the indicated corner, Sullivan told Mayer to open the package which he had been carrying. Complying with this order, Dan discovered that the bundle contained twenty needle guns. Although these weapons were scarcely larger than a

man's thumb and index finger, each of them was capable of firing a thousand shots without reloading. The tiny needle-like bullets were made of toxite, a metal which was harder than glass, tougher than steel and more poisonous than aconite. Projected by minute charges of a super-explosive called radatomite, one of these minute bullets could stop the charge of an elephant at a range of fifty meters or more.

THE five creatures that Captain Hawkins led to the corner of the barrack-room a few minutes later were a disreputable looking gang. Tattered and dirty, shivering with cold, their eyes still heavy with fatigue, they hardly looked capable of leading a revolt against the ruthlessly formidable forces of the Martain slave-drivers. But Sullivan, expert as he was in evaluating human character, was able to penetrate the superficial disguises with which their abjectness and haggardness had clothed them, and he quickly perceived that Hawkins had selected wisely and well.

Speaking softly but clearly in Espevolapuk, the language which all Earthmen understood, Lieutenant Sullivan said: "I take it for granted that if you thought you had a good chance to escape alive from this miserable hole, you would much rather run the risk of being killed in the act of fighting your way out than remain here where you are cerain to die horrible deaths anyway. What do you say, fellows—am I right?"

Unanimous murmurs of assent assured him that he was.

"A. Z., Earthmen. Here's the plot. To each of you I'm going to give three of these poison needle guns. Whether you are familiar with them or not, you can easily use them. All you do is point in the direction you want to shoot and squeeze the trigger. One of these guns is more than a match for a Martian electrolysis gun—providing of course that you shoot first.

"The time set for a revolt is sundown this evening. That will give you the advantage of escaping under the cover of darkness. Captain Hawkins will give the signal by whistling through his fingers. When you hear this whistle each of you, with as many assistants as you can recruit in the meantime, will turn on the nearest Martian guard and tie him up. Try to avoid unnecessary bloodshed, but if any one of the guards makes a move to use his gun or to signal for help, shoot him instantly.

"Between now and sundown, we depend on you to pass the word around among your fellow slaves. Each of you is to keep one of the guns yourself and give the others to two of your companions on whom you know you can rely. It is hardly necessary for me to tell you that you must be extremely cautious so that none of the guards will suspect the plot. Is that all clear?"

One of the slaves, a huge, bearded brute of a man with a horribly distended abdomen—obviously the result of an encounter with a Martian electrolysis gun—growled: "Suppose we do kill or tie up the guards, how are we going to get away from this Hell-on-Mars?"

"It will be up to you five men to figure that out," Sullivan told him. "You know more about this planet and the habits of the inhabitants than I do. I'll be absolutely frank with you and tell you that we have a spaceship hidden near here but it is a small one—only large enough for the particular ones we came here to rescue. Perhaps that sounds a bit selfish, but

you should realize that we didn't have to let you fellows in on the plot and by doing as we have, we may be jeopardizing our own safety."

"I appreciate that," the slave answered. "But if you can't help us in the getaway, perhaps you can give us a suggestion or two as to how we can help ourselves."

"Gladly," Sullivan responded. "I notice that there are several Martian airmobiles parked near the stables. It ought to be a simple matter for you fellows to commander these ships and fly to Menfol. Perhaps you already know that Zurek keeps his slaving space-craft here. If you work fast, you ought to be able to surprise Zurek and his band of blackguards. There must be someone among you who knows how to operate a space-ship. How about it?"

"I used to be a pilot for the Solar System Space-Freight Corporation," one of the men said.

"And I am a graduate space navigator," another whispered huskily.

"There you are!" Lieutenant Sullivan exclaimed. "Are there any other questions?"

The five men shook their heads and Sullivan went on, "Hail, Earthmen! Each of you take three of these guns and hide them under your garments. Remember you are the appointed leaders and the fate of all your companions depends on how well you do your parts. And now—good hunting to all of you!"

"Good hunting to you, Lieutenant!" they murmured in unison and slinked back to their sleeping places.

When they had left, Hawkins, who had of course remained behind, said, "Any special instructions for me, Jim?"

Ignoring the question, Sullivan asked, "Do you know Ingeborg Andersen?"

"Never met the lady," Hawkins answered. "But her name sounds interesting. Who is she?"

Before Sullivan had time to answer this question, Ensign Mayer did it for him: "She's the daughter of Lars Andersen, the Christian missionary on Ganymede. Together with some native Ganymedians she was abducted about a week ago. We have reason to believe that she was brought here."

"That's quite possible," Hawkins told him. "A new bunch of slaves arrived the day before yesterday. I believe that part of them were Ganymedians. Perhaps Miss Andersen was among them. I was working in the wok pastures at the time so I couldn't be certain. Why do you ask about her in particular?"

"She's the one we came here to save," Mayer replied.

"A very special friend of Dan's," Sullivan explained.

"I see. Sorry I can't help you locate her," the captain deplored.

"Our most important job is to find Ingeborg," Mayer stated. "Do you mind if I hunt for her now, Jim?"

"A. Z," the lieutenant consented. "But you must be very careful. The work horn is liable to sound almost any minute now, and you mustn't let any of the Martian guards see you."

"I'll be careful," the ensign promised as he started the almost endless task of minutely examining the faces of the innumerable sleeping slaves.

While he was doing this, Sullivan told Hawkins about the invisible space-ship and the luminous blaze-marks which he hoped would guide them back to it.

"Try to get as close to this building as you can before you give the signal," he directed. "Dan and I will be hid-

ing inside the barrack room. Meanwhile, during the feeding and rest periods, see if you can locate Miss Andersen. She's a very beautiful blonde, with honey colored hair, blue eyes and a fair complexion."

"A very rare combination nowadays," was Albert's comment. "She ought to be easy to find."

"A. Z. When you find her, try to tell her about the impending revolt. Give her one of your needle guns and tell her to use it if necessary and to meet us at the west entrance of this building. Be there yourself of course. During the fighting and the resulting confusion it ought to be easy for us to make our way to our space ship and merrily start on our journey back to Ganymede. Do you intergrate with me?"

"I check," Hawkins wrung his comrade's hand and grinned: "Guess I'd better crawl back in my luxurious couch. Good hunting, Jimmy Boy!"

CHAPTER VII

Mayer's Rash Attack

THOUGH he searched with frantic haste, Mayer was not able to inspect more than one-tenth of the sleeping slaves before the raucous note of the workhorn forced him to hurry back to the corner where Sullivan had already buried himself beneath a heap of evil smelling straw. Dan lost no time in doing likewise.

From the sounds which filtered through the bedding, the two space marines inferred that the slaves were bestirring themselves and filing out of the barrack room. They could hear the muffled shouts of the Martian slave-drivers, accompanied by the cracking of their cruel whips which, even through the thick, mud walls of the building, sounded like rifle shots.

Presently the noise became louder, indicating that two or more of the slave-drivers had entered the barrack room. Closer and closer came their coarse laughter and ribald shouts. Though Dan did not understand a word of Martian, he sensed correctly that their conversation consisted principally of profanity and obscenity.

"What are they saying?" He whispered into the ear of Sullivan, who was lying beside him.

"They're counting the corpses." Sullivan replied softly. "Apparently they have placed bets on the number of slaves who will be dumped into the grave-canyon this morning. So far the score is seven to nothing."

Just then a whip cracked spitefully. It was followed by a pitiful scream. A woman's voice, speaking in the Earth language, began to whimper: "Please leave me alone. I'm ill, I tell you—so ill that I can't even stand on my feet. Please don't force me to work in those horrible stables today. I'd do it if I could—but I'm so weak and so sick that I just can't do it."

The only answer was another crack of the whip, followed by a vile Martian oath.

Mayer, his voice trembling with emotion, whispered, "That sounded like Ingeborg's voice." Oblivious of the risk he was taking, he sat up. Fortunately the pile of straw above him still concealed his head and the room was so dimly lighted that the movement was not noticed by the guards.

Catching one of his wrists, Sullivan cautioned: "Steady, Dan. One false move now may spoil everything."

But Mayer gave no heed to the warning.

"It *is* Ingeborg," he cried as he wrenched his arm free and leaped to his feet, hurling himself furiously at the two gigantic Martians.

Impelled by a sort of Berserker rage, his fists flew out with astonishing speed and force. The two Martians were completely taken by surprise and, huge as they were, both of them went down under Dan's fierce onslaught.

One of them got up again and reached for his weapon but Mayer beat him to the draw and covered him with his needle-gun. Thus, for a moment at least, he gained command of the situation. How to make use of this temporary advantage was quite another matter. As he stood there, brandishing his gun, wondering what to do next and feeling very foolish, his problem solved itself in a rather unexpected and disastrous manner. There was a swishing sound and the gun was neatly flicked out of his hand. Unperceived by Mayer, a third Martian had sneaked up behind him and, with remarkable accuracy, had struck the pistol with the end of his long whip. The lash cracked a second time and Mayer's arms were pinioned to his sides by its python-like coils.

A whistle shrilled and a few seconds later another Martian, apparently an officer, entered the barrack room. With excited words and gestures, the slave drivers explained the situation to him.

Speaking in broken Espevolapuk, the officer asked Mayer who he was and what he was doing there.

Mayer did not answer.

"How did you get here?" the Martian demanded.

No response.

"Where are your companions?"

"I have no companions," Dan lied. "I came here alone."

"Where did you come from?"

Silence was the only answer.

"So!" the officer roared. "You refuse to talk, do you? We'll see about that." Then he said something in Martian to his men. They seized Mayer and dragged him outside.

FROM his hiding place Lieutenant Sullivan had witnessed Mayer's rash attack and his subsequent arrest. It took a great deal of will power for him to restrain his natural impulse to help his pal. Fortunately for both of them, many years of active campaigning as a space marine had schooled Sullivan in the highly essential virtue of self-control. Even when he heard the Martian officer order his men to throw the Earthman into what probably was a torture chamber, he managed to hold himself in check, realizing as he did that there would be little hope of rescuing Miss Andersen if he too became a prisoner.

Although Mayer's attack on the slave drivers had seemed rashly futile, it did accomplish one thing: It diverted the Martians' attention away from Miss Andersen, and, for a while at least, made them forget to molest her.

As soon as they had left the barrack-room, Sullivan took advantage of this contingency. Worming his way cautiously across the straw-littered floor, he crawled to the place where the missionary's daughter lay moaning and weeping on her miserable bed.

"Miss Andersen!" he whispered.

She raised her head with an effort, gazing at him through eyes which burned with pain and terror.

"Don't be afraid of me," he said in a low soothing voice. "I am Lieu-

tenant Sullivan of the space marines. We have come to save you and take you back to Ganymede."

Scarcely seeming to comprehend, she moaned, "Dan! What's going to happen to him?"

Though he was as much concerned about his friend's fate as she was, Sullivan tried to reassure her by saying: "Don't worry about Dan. He can look after himself. The Martians certainly will not kill him. They know that he is more valuable to them alive than dead. He'll be kept imprisoned for only a few hours more or less. At sun-down the slaves are going to revolt, and Dan of course will be rescued." Then he briefly outlined to her the plan which he had formulated to outwit the Martian slave drivers.

Like all space marines, Sullivan was a graduate physician and he carried with him as part of his regular equipment a compact but remarkably complete medicine case and first aid kit.

Ingeborg's ailment was easy to diagnose. It was the sickness from which practically all of the wok-slaves eventually died and which for that reason was called "Slave fever."

Sullivan administered a dose of Zonine, an alkaloid which was made from the bark of a Venerian tree, followed by a powerful but non-habit-forming stimulant. Within a few minutes her fever had subsided and her strength began to flow back into her wasted limbs.

Cognizant that he could do no more for her until evening and reluctant to risk being discovered, Sullivan then crawled back to his hiding place in the corner and spent the rest of the day in the most unpleasant way a man of his type possibly could—namely in doing nothing.

CHAPTER VIII

The Revolt of the Slaves

UNDER the able leadership of Captain Hawkins, the revolt of the wok slaves took the Martians completely by surprise. When they found themselves staring into the small but formidable barrels of the needle guns, most of the slave guards surrendered and were quickly bound and gagged. Only one of them, apparently the commanding officer, was courageous enough to put up a fight. He died with merciful speed—a dozen poisoned needles in his abdomen. Others tried to run away in the direction of the signal station, but they were slain before they had time to televise for help.

As soon as he was sure that all the guards had been disposed of, Captain Hawkins hurried to the corner of the barrack building, where he had agreed to meet Sullivan. He found the lieutenant waiting for him at the appointed rendezvous.

"Sorry, Jimmy," he panted. "I've had my eyes peeled all day without catching a single glimpse of anyone who could possibly be Miss Andersen. Looks like your expedition is a fizzle so far as rescuing her is concerned—that is, unless a miracle happens."

"The miracle has already happened," Sullivan said. Then he told Hawkins what had occurred in the barrack room that morning.

"And where is Dan now?" Albert asked.

"That's for me to find out," said Sullivan. "I'm afraid it's going to be a tough job to locate him in this maze of buildings—especially at night."

"Haven't you any idea where to look for him?"

"The only clue I have is the command which the officer gave to the

slave drivers who captured Dan."

"What did he say to them?"

"I'm not absolutely certain but I thought he told his men to throw Dan into something or another. It sounded like—but I'm sure I was mistaken."

"Spill it," Hawkins demanded. "What did it sound like?"

To which Sullivan replied, "The Martian word for silo."

"That's all I want to know," Hawkins exclaimed.

"You mean you know where Dan is?" Sullivan asked anxiously.

"Yes. And if he's still alive we'll have him out in two shakes of a meteor's tail. It's a good thing you heard that word 'silo,'" Hawkins added. "Otherwise we probably never would have found him."

In the fast waning twilight, he led the way to a remote corner of the wok farm. With his feet he explored the filth which strewed the ground, finally locating a slab of stone. This he quickly removed, disclosing a Cimerian pit from which a musty, putrid smell emanated.

"This is what the Martians call a silo," he whispered. "It's just a huge pit dug in the ground. They use it for storing wok fodder. It's a lucky break that I had the job of emptying this silo the day before yesterday. Otherwise I shouldn't have known about it."

But Sullivan wasn't listening. He was down on his knees, yelling into that horribly ominous pit: "Hi, Dan! Are you down there, Dan?" His words came rumbling back to him like a peal of distant thunder.

Wth the reverberation was mingled a feeble cry which sounded as if it came from the very bowels of the planet. Sullivan couldn't understand the muffled words, but he recognized the voice of his pal.

"It's Dan, A. Z.! he rejoiced. "For God's sake, let us—"

But Captain Hawkins was already hurrying to the stables from which he promptly emerged carrying a coil of rope. A moment later they hauled Dan to safety. He was weak and haggard and he reeked to high heaven but otherwise seemed unharmed by his terrible ordeal.

By this time the Bedlam which had marked the revolt of the slaves had subsided. From the humming of the airmobile motors, the three space marines surmised that all the slaves who had survived the battle had escaped.

Quickly they returned to the barrack room, where Lieutenant Sullivan located Miss Andersen and carried her out in his muscular arms. The frigid blackness of the Martian night enveloped them; but, thanks to the luminous blaze-marks, they had no difficulty in finding their way back to the Cosmicraft.

As soon as they were all inside the ship, Captain Brink shoved off and headed for Menfol. As he approached the slavers' lair, he turned on the search beam, which drenched the ground with Q-rays. Slightly higher in frequency than ultra-violet emanations, this beam was utterly invisible to ordinary vision; but to the flyer's teleview with its super-sensitive filters and screens, the scene below was brilliantly illluminated.

In the objective of this marvelous device, Captain Brink witnessed the final episode of the wok-slave's revolt. The ground was already strewn with scores of motionless bodies. Sprawled in grotesque postures, which only death could sculpture, they told an eloquent tale of the furious battle which had just taken place. Brink was gratified to observe that most of the corpses were Martians.

Only one of the slavers was still on his feet. From his massive build and his carefully braided beard, Brink easily identified him as the notorious leader, Zurek.

Armed with two of the dreaded electrolysis guns and standing with his back to the huge hull of the Krovenka space-ship, Zurew was putting up a terrific fight against hopeless odds. From his point of vantage in the air, Captain Brink saw three Terrestrials with make-shift shovels, who seemed to be burrowing beneath the space-ship's rotund belly. This mysterious activity was clarified a moment later when a man's head cautioutiously emerged, only a few decimeters from the unsuspecting Martian.

So clear was the image in the televiewthat Brink could easily distinguish the lemon-colored skin and lynx-like eyes of a Japanese laborer. Worming his way out of the burrow, the undersized Oriental hurled himself at the gigantic Martian. The surprise was successful, and the Jap was able to clamp an age-old Jiu Jitsu hold on Zurek's right arm, forcing him to drop one of his electrolysis guns. Instantly the weapon was snatched up by a burley negro, who fired point-blank at the Martian's expansive abdomen.

A frightful, anguished expression distorted Zurek's beastly features, and his body began to bulge and swell, like lava in the crater of an erupting volcano. Seasoned warrier as he was, Captain Brink found this sight too grewsome for even his strong stomach to stand, so he quickly snapped off the televiewer.

"Well," he remarked, "the code of the Earth Republic Space Navy makes no provision for reprisals, and the thought of revenge is contrary to our religious principles—nevertheless there is some satisfaction in knowing that Zurek and his gang of blackguards have gotten what was coming to them—don't you think so, Al?"

The only answer was an ear-torturing snore. Curled up in one of the hammocks, Hawkins had already embarked on his favorite vocation—that of catching up on his back-sleep.

Captain Brink turned in the control seat and glanced at the other occupants of the space-ship. Sullivan was also assiduously engaged in riding his hobby. So absorbed was he in attempting to put his three dimensional puzzle together, that he obviously had not even heard the Captain's remark.

As for Miss Andersen and David Mayer, they were seated side by side at the extreme after end of the cabin. Gazing into each other's eyes with the intensely fervent ardor of young love, they had retired into an intimate, private world of their own. Never in his long and eventful life had Captain Brink seen two lovers who were so completely lost in each other.

"Oh, well," Captain Brink sighed, as he again turned his attention to the controls of his beloved space-ship: "There seems to be nothing for me to do but talk to myself. It's too bad I'm such a beastly bore."

THE END

THE MATHEMATICAL KID

by Ross Rocklynne

"You're heading for a crack-up!" warned the kid. He said it so often he succeeded in becoming a nuisance. But then...

I WAS walking fast down the quarter-beam tunnel toward my watch on the skipper's bridge, shrugging on my first mate's coat, when,

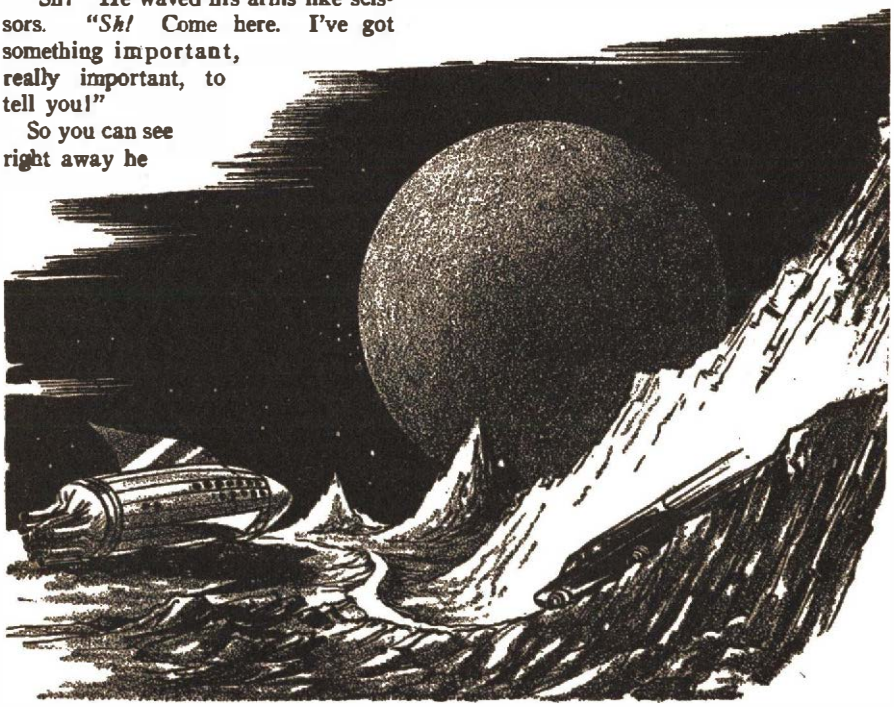
"Psst!" he whispered, beckoning me from under the companionway.

I stopped, pivoted my head. It was the twerp. I said, staring,

"Well, what the hell do you think you—

"Sh!" He waved his arms like scissors. *"Sh!* Come here. I've got something important, really important, to tell you!"

So you can see right away he



was a twerp—our new cabin boy. It was emergency that made me and Old Scratch—he's the skipper—take him on. Yesterday, just before we hit heaven, he had snuck up the gangway and bearded Old Scratch on the bridge.

Kind of a funny kid, built like an asteroid—hard and rocky, yellow hair sticking out of his head like straw from a scarecrow, eyes glowing like blue neon signs advertising the presence of his turned-up, butt-end-of-a-peanut nose. It was funny, darned funny, that he had showed up just when our regular cabin boy was missing and we were getting ready to shove off.

So we had to hire him. Then Old Scratch and I shooed him off the bridge, and we went on checking and rechecking the orbit figures the Corporation

had computed for us.

And now here was the little werp acting mysterious, as if he had a conspiracy on tap.

"All right," I growled, "spill it!"

"Listen to me!" he hissed, pulling my head down to his with a half-Nelson. "Nobody else will. I tried to tell the captain, but he flew off the handle. Do you know why I took this job?"

I said, sarcastic, "Sure. You was working your way through—"

His neon eyes snapped.

"No, no!" His police siren voice sank to a hoarse whisper. "That isn't it! I took the job because I wanted to save the *Aphrodite* from cracking up! Yes, I did, actually and literally!"

"Hey," I yelped, drawing away, "are you bats? Here we are, only three units out from the mother planet, and you're wobbly already!"

He grabbed my arm excitedly. "You're traveling the EPlx344 orbit, ain't you, Sandy? Well, that's the wrong course. I'm telling you for your own good, and you better switch over to another one quick! The *Aphrodite* is due for a crack-up eight days, seven hours, and forty-three minutes plus or minus from this very second!"

"Stow it, fellow!" I said real sharp. Then I spoke kindly, as I turned away.

"Go to your bunk and climb in, and I'll make your apologies to the skipper. Now get along, and wait until you know something about celestial mechanics before you go letting your one-horsepower brain do a hundred-horsepower job.

"Remember, you're not any Georgie Periwinkle." And I left him with that, though I did feel a little bit guilty, because his face fell a mile. But it was a laugh, him trying to tell *us* we were following a collision course.

THE next day, I left the bridge for a couple minutes, and went down the engine room to see what in Hades was causing the sour note in the Wittenberg* howl—the chief engineer told me that there were air bubbles in the lead cable. When I came back up on the bridge, the kid ran out.

He looked at me accusingly, and pointed a stubby forefinger at me and bleated.

"He wouldn't listen to me, and neither would you! You're going to be sorry!"

"Listen, Kid," I said patiently. "I think we've had just about enough of this stuff. I warn you, quit bothering us, or I'll warm the seat of your pants so hot you'll never forget it!"

"What ails that kid?" snarled Old Scratch, his red, puffed-up beacon of a nose winking. He slammed his charts down on the table and glared at me as if I was a source of misery.

"I ought to fire you, damned if I shouldn't, for letting me hire him in the first place!"

"Say," I yelped, "you mean to say *I* hired him? Why, you old—"

He settled down. "Hold your temper, you old space hound," he snapped. "Maybe we have been up and down around the sun all our lives together, but that don't give you no extra privileges, see?"

"Yes, sir," I simpered.

"Now, Mr. Flabberty!" he growled. "Who's putting crazy ideas in the kid's head? If it's *you*—"

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*Wlttenbergs are the motors invented by Silas B. Wittenberg, late in the century, which supplanted the dangerous rocket drive by direct explosion. In this type motor, the possibilities of control are much extended, and the danger of explosion of the entire fuel supply is eliminated Lead cables conduct the mixed gases to the outer firing chambers, and prevent static electricity sparks which are quite a problem around metal parts in space. However, a weakness still exists, in the air bubbles which frequently obstruct the cables and cause uneven fuel mixture. This results in a bowling noise.—Ed.

"Aw, be yourself, Cap'n. He's got a touch of the wobblies, that's all."

"See atmospherics then, and have his air regulated. I ain't going to have no wild kid gumming up this run. We got a load of ten-thousand-dollar, airtight automobiles to get to Pluto in the next sixty days, and whadaya think's gonna happen if we don't get them there in time, huh? The Corporation'll give us the bum's rush, that's what!"

"He been bothering you that much?" I demanded, incredulous.

"Damned right he has! Beggin' me with tears in his eyes to change our orbit. Beggin' me if I won't do that, to cut our acceleration down to half a G, for three days at least."

I gasped, "What for?"

He said aggrievedly, "How should I know? He's enough to give anyone the meenies, that's what. I'll begin to believe our course is all wrong myself. Keep him outa here—he worries me."

The skipper shifted on his big feet uncomfortably, cocked an impatient eye at me.

"Recheck our course," he growled. "And then check it again. Go on, you, get going! And when you're finished, put that crazy kid in the brig!"

So I wearily checked and rechecked, and checked again, and I began to think how nice it'd be to step on the kid's face.

I made a mathematical sweep through 10° of the ecliptic plane, and just to make sure went 20° above and below, using the *Ephemeris* and a slide-rule to calculate possible *puncti*—and there wasn't, and would never be, even a rock in our trajectory; not unless it was above 20°, coming in at a 90° angle and at an impossible speed—and we all knew there wasn't anything like that.

So we had clear sailing. The ether was clean. We could plow right through. Hadn't I just calculated it? Sure.

So I knew the kid was wobbly in the bobbly, and it didn't hurt my conscience a bit when I cornered him in the galley and stuck him in solitary. We left him there—two and a half days. Yes, you guessed it—at the end of that time, all hell broke loose!

FIVE days out; and following the EPlx344 trajectory, the Wittenbergs went dead, and the *Aphrodite* coasted. We were on schedule, we were doing a neat hundred-point-oh-three miles per second, and we forgot about the kid.

Then—right in the middle of my snore-watch—I was jolted out of my dreams by Old Scratch's voice screaming from the general audio.

"Attention all!" he roared. "Attention all! Rock ahead! Wittenbergs! *Wittenbergs!* Get them Wittenbergs howling! Lane! Two gravities fore!"

I bounced out of bed, pulled my pants on and went sailing for the bridge. The chief engineer came charging down the corridor in his nightshirt.

"Two gravities fore!" he was gasping. "Jerusalem H. Slim!"

Old Scratch was still blaring into the general audio, when I came in.

"Two gravities fore! Larramie, lay off the pilot blasts—you'll send us through the bulkheads, at this speed! Telescope! Give me the dope on that again, and if you've made a mistake, I'll make a personal autopsy on your gizzard to see what brand you're using!"

"89° to the ecliptic," the telescope man's frightened voice said. "Almost perpendicular. There ain't nothin' like that! 14—16—20—50—100—150—160—Great God," he yelled, "the tape reads 163 per. I just don't believe—"

"Shut up!" Old Scratch snarled. "Believe your machines! Two and a half gravities fore!" he roared.

And the Wittenbergs began to whine,

and crescendoed upward until a hell of awful sound shook the air. I had to stand at a slant. As I walked toward the console, I felt just like I was walking up a forty-five degree hill, only worse.

"Three gravities fore!" Old Scratch snarled.

"We can't take that!" I panted.

"I'm gonna take it, and so'll everybody else. Whip it up—three gravities!"

Chief Engineer Lane began to whip it; and I began to weigh 540 pounds.

"What about the kid?" I whispered.

"To hell with the kid!" he yipped. Three gravities were straining his 200—600 now—pounds back against his braced chair.

He yelled out, "Four gravities fore!" and that was the end of me. Old Scratch tests out at five gravities, I can take four and a half most of the time. But this was one of my off days. I was forced back against the wall, and saw something big and gray rushing at us in the view-screens.

I couldn't breathe. If that wall hadn't been there, I'd have gone tumbling the whole length of the ship. When Old Scratch added another fraction of a G, I began to give way inside. Everything blurred.

Suddenly the ship swung. It must have, because I fell clear across the room, bounced soggily into another wall. The Wittenberg howl tore at my eardrums. I felt a huge wave of sound and pure vibration surge through the ship. And then *bang!* I was gone—just like throwing a knife switch.

I WOKE up, and felt light as a feather. I opened my eyes. I moved an arm, pivoted my neck, saw a row of beds filled with patients. I groaned. Then I began to get heavier and heavier, as the gravity perspective came back; and soon I knew that something like maybe only one, or one and a half gravities was sitting on me.

"Feeling better?" Dr. Ran Tabor came across the room, grinning all over his drunken face. He was our ship doctor, sort of a renegade from the profession.

Somehow I asked about the kid first.

"Him? Up and around last two hours. Some kid, him. Got bones like rubber bands. But you're brittle from the fuzz on top of your head down to the nail on your big toe. You got two busted ribs."

"Did we—did we crash?"

His brows came up. "Ha-ha! Sure, we crashed. Hard. Ha-ha! Aft section stove in—hospital full—main jets wrecked— Do you blame me for gettin' drunk?" He scowled.

I sank back wearily. "Send me Old Scratch, if he can make it."

Tabor scowled. "Nothin' could hurt that old buzzard."

Old Scratch came charging in after awhile, his eyes stormy. He all but shook his fist under my face.

"You!" he snarled. "A big, strong man like you foldin' up under four and a half gravities, and just when I needed you to—"

I yelped indignantly, "Why, you old—"

"Shut up!" Then he softened. "You know what happened? We tried to swerve at the last minute—the pilot blasts. Didn't work. They just twisted us around on our center of gravity, and the ship bounced her stern against the planet, stove in the supply hold, and tore up the main jets into scrap metal.

"So now we're caught here, see? There ain't any way of lifting her. This is a one and a half gravity planet."

He gnawed at his unshaved lip; he glared at me as if he thought I ought

to be the angel of deliverance.

"We should be able to lift her some way," I began.

"With the forward jets? Don't be stupid. The firing area ain't enough to lift us from a one-gravity planet, let alone a one and a half. Well, you lay there, and figure something out, and get those ribs healed up, sissy!" Then he went charging out of the hospital.

Couple hours later, the kid came in, his eyes glowing with excitement. He came right up to me. Maybe he thought I was his friend even if I did treat him rough.

"I think I've found something," he said excitedly. "It's wonderful. It really is. But first I have to test it."

"Test what?" I scowled.

"Test the planet," he said in surprise, just as if he was talking about dropping something in a retort and boiling it over a Bunsen burner.

HE got enthusiastic again. "You see, the main thing that's bothering the captain is that this is a one and a half gravity planet, and the ship is so bunged up it can't draw away from anything more than half of that—that's what Old Scratch said.

"So the thing to do," he went on, impressively, "is to decrease the amount of gravity pulling on the ship!"

And he gave me a "see how simple it is!" look.

I groaned, and almost gave up the ghost.

"Who told you about this planet," I said weakly, "and how big is it?"

"Nobody told me about it, and it's three thousand miles in diameter!" Then he stepped back and his neon eyes lost their enthusiasm, and flared with anger.

"You're like Old Scratch and everybody else!" he bleated ragingly. "I told you days ago the ship was going to crack up, and now when it does, you think that somebody else told *me!* I computed it myself! I saw your orbit figures in the Astronomical Section of the *Philadelphia Herald*, and I had just discovered this planet, and I saw right away you were going to crack up.

"I'll fix *you* guys!" he cried. "After this, when I find something, I won't say a word. No, I won't. I'll let you figure it out yourself—*pickle-puss!*"

And then he turned away and marched fuming out of the room. Then for the first time I began to wonder if we weren't misjudging the kid and treating him too harsh. But I forgot all that by what happened next.

* * *

Two days later, the sawbones braced me with a couple yards of adhesive and let me get up. I dressed, feeling wobbly, what with one and a half gravities on me, made my way to my office in the ship, made out a requisition for a pressure suit, and then looked up the maintenance man. He measured me with one eye while he picked a pressure suit off the rack with the other.

The tender let me out the airlock into the middle of a big, smooth, dark plain ringed with low hills about six miles off, I guessed. The stars in the black sky were cold, fixed points of lights, so I knew there wasn't any atmosphere.

At the stove-in stern of the *Aphrodite*, a half dozen of the boiler boys were at work with oxy-acetylene torches. They were bungling the job, and Old Scratch knew it. But he kept them at it, trying to weld those shapeless masses back into position again.

"Oh, so you're up after takin' it easy two days," he snarled. He glared, but beneath the glare he was a confused, helpless old space hound, wondering how in the devil he was going to get a hundred and ten airtight automobiles to

Pluto in the time called for by contract.

"If you've thought of anything, Mr. Flabberty," he growled, sarcastic, "I wish you'd spill it, instead of keeping us in such delightful suspense. How do we get away from this one and a half gravity planet?"

"Easy," I told him, grinning all over my face. "You decrease the gravity to, say, three-fourths of a—"

His face began to screw up, and he took a step toward me.

"That's just what the kid said!" he growled, with murder in his eyes.

I BACKED up. "Hey, wait a minute! Don't blame me if the kid said it," I protested. "And besides, since he did predict the crack-up, he might be right about this, too!"

"My dear Mr. Flabberty! Of course he's right. All we have to do is decrease the gravity. But maybe the planet won't lay down and wave its hind legs in the air like the kid thinks!" he thundered.

"And as for the kid predicting the crack-up, I got my own ideas about *that!* Somehow he found out that the Corporation had deliberately plotted us a bad course. And for why? Why, so they could collect insurance on the old tub, that's why. As soon as we get outa this mess I'm gonna collar that kid and find out just where he got that information, so help me, I am!"

And looking at him, I suddenly began to feel sorry again for the kid. He was just plain poison to Old Scratch.

I looked around. Few miles away, just like we were in the center of a big crater, were a ring of low hills; and beyond that the land stretched away into a clear-cut horizon. I turned around and around, looking for the kid, but I didn't see him.

That was funny. He hadn't been in the ship either. Maybe he'd gone for a walk somewhere. Maybe he'd got lost.

"Good riddance!" said Old Scratch disgruntledly. "That'll be one less passenger we have to carry along."

* * *

BUT five or six hours later, when we are all eating in the mess hall, the skipper went into a rage, pounding his fists together.

"It ain't enough that we can't lift ourselves," he panted wildly. "It ain't enough that we can't repair the main jets. Now we have to organize a search party, looking for a damned half-pint Jonah!"

But we did do just that, four groups of us starting out under the cold stars in four different directions. We got about two hundred yards away from the ship when Wilkes, our electrician, said in awe.

"Here comes that there moon."

The rest of them had seen that moon, but I hadn't, though I'd heard about it. I gawked. It came thundering over the horizon, like six white horses around the mountain. It was small at first. It got visibly bigger as we traveled along. It came faster, while I almost broke my neck watching the crazy thing. It swooped at us, getting bigger, coming faster.

At the end of an hour it was over our heads, five times as big as when we first saw it, and going like Mercury in a planetarium. It couldn't have been more that fifteen, maybe twenty thousand miles away. Then it began to go toward the other horizon, getting smaller, farther away, decelerating.

At the end of two hours, when we reached the foot of the hills, it had completely gone from horizon to horizon, accelerating, growing in diameter, decelerating, shrinking as it set.

"Wow!" somebody breathed. "Crazy moon!"

Old Scratch, still itching to get his

hands on the kid, said, "T'hell with it! It's just got a highly eccentric orbit."

But, of course, none of us knew why.

WE started up the hill. The ground was rocky with strangely smooth boulders, as if they'd rolled a long ways. There was sand, too, and small pebbles. We topped the hill, the four of us, and stood looking out over the plain.

Suddenly we saw something, a little black dot, rolling along toward us down there on the plain.

Wilkes gasped unbelievingly, "It's an automobile!"

I looked at Old Scratch and saw his face getting redder and redder behind the helmet of his pressure suit. His lips mumbled something. After that we were all silent, waiting while that airtight, torpedo-shaped automobile, made for traveling in rough country over almost any gravity, came nearer and nearer. It started up the hill and stopped about twenty yards from us, with the kid at the wheel.

We stood there in grim silence. The door opened. The kid got out, took one look at our faces, and then scrambled back in. Through his radio headset he panted.

"Don't you come near to me! Don't you touch me. Because if you do, I'll tell my friend the President of the United States. I had to steal the automobile from the hold—I had to test the planet!"

We were looking at the tires of the automobiles. Ripped to shreds. We were looking at the paint job. Dented, scratched, a mess. We started toward the automobile.

But the kid stepped on the starter, swished forward, detoured around us at the last second, and then stopped about forty yards away.

"I promise to ride you back to the ship," he panted excitedly, "if you promise not to get rough with me. Anyway, you *can't* get rough with me!" he pleaded. "I've found a good way to decrease the gravity!"

"We promise not to get rough with you," said Old Scratch, in an 'it gifs candy und ice cream' voice. And so help me, we didn't—then! When we got back to the ship, Old Scratch and I waited around until the kid got his pressure suit off, and had himself exposed. Then we both leaped at him.

"Me first!" said Old Scratch, holding up a hand. And he went at it, and laid it on so thick I didn't have the heart to add any more to what he deserved. We sent him to solitary for two days.

We found later that the car was all out of line. The kid must have put it through some rough punishment, because those cars are built to withstand a lot. Not that it was going to hurt our contract—we only had to deliver a hundred cars. We had ten extra, just in case; it was just the principle of the thing.

Then, with that episode off our hands, we began to drive ourselves crazy trying to think of ways and means to get off this world. Our transmitting apparatus wasn't powerful enough to signal somebody to come and get us.

And if we waited around for somebody like Georgie Periwinkle, the mathematical genius, to discover this planet and start an exploration, why we'd all be starved; or, at the least, we wouldn't get our precious load of automobiles to Pluto.

No matter which way you looked at it, things were an unholy mess.

AND then the kid went and did it again.

We had been bottled up on the planet a week. We had stopped working on the main jets—they just wouldn't fix. Old Scratch and I were sitting on the

bridge and looking at the walls, hopeless, when the doors open and in comes the kid.

Old Scratch made an annoyed, tired sound.

The kid's face was flushed. If I didn't know he was just a kid, without any sense in his head, I might have thought the look in his eyes was dangerous. So I just looked at him, my mind a billion miles away.

The kid was almost panting with some kind of nervousness.

"Cap'n" he husked, "I know how to get us off this planet!"

Old Scratch muttered to himself, "Yeah? Run off and peddle your peanuts some place else. Cán't you see we're busy? Besides, you're fired."

The kid's voice trebled. "You better listen to me!" he panted.

Old Scratch looked at him. A gleam came to his eye. The front legs of his chair hit the floor, and he started to roll up his sleeves.

Quick as sound, the kid leaped back, his eyes just like slits. Suddenly my breath zipped from my lungs at what I saw.

"Stand back!" he yelped, as I came to my feet and started toward him.

"Put that paralyzer down!" I snapped. "You want to hurt somebody?"

"Stand back!" he yipped, fairly dancing on his feet.

But I knew he was just a kid, and that he wouldn't pull the trigger and I started toward him, sore as a boil, when suddenly—well, suddenly. I was out cold. Dead to the world. Something had nudged my brain, had short-circuited certain nerve centers.

And that was absolutely all I knew until I opened my eyes, and there I was in that all-fired ship's hospital again, and Dr. Ran Tabor was breathing his liquory breath into my face.

The quartermaster, the chief engineer, the maintenance chief, and half a dozen others were standing over me.

They started yelling all at once.

"What happened?"

"Where's the captain?"

"Where's Johnny?"

So I told them, and then they told me.

Old Scratch was gone, not a trace of him or Johnny anywhere! And to tie the whole thing up, the airlock to the freight hold was open, and another automobile was missing!

"He kidnaped him," the quartermaster said. "Well, I'll be a horse's neck. It just don't make sense."

I struggled to my feet, jabbed a finger at Wilkes, Lane and Cummings, the quartermaster.

"Break out another one of them automobiles," I snapped. "We're going to find that kid, and when we get him—"

I DIDN'T know exactly what I would do with him. But it would be something drastic. Something horrible. Something ghastly. Yes, it would! And if I felt that way, how would Old Scratch feel when we finally freed him? I began to get happier with each passing second.

We made the low, sloping hills in fifteen minutes, following the path the kid had taken the time before. We went beyond the hills, winding our way around unbelievably smooth boulders, following the tire tracks through the sand and gravel. We went pretty fast, hitting high as much as we could, and after about an hour we noticed the plain was beginning to slope—all at once. I mean, the whole plain was tilting up.

"Say, that's funny!" said Cummings.

I'll say it was! It got even funnier. The farther we got away, the more the plain sloped. It went past 20°, started hitting 30° After about five hours—

we were still following the tire tracks—it went up to 45°!

We must have been four or five hundred miles away from the ship at that time. And the hill stretched endlessly upward, and endlessly to each side, and endlessly downward.

Practically speaking, it was a plateaulike surface, stretching away evenly in all directions, with occasional small hills and swells growing out of it. A lopsided plain!

It was the mightiest, eeriest, most colossal hill I've ever seen or ever will see, because it never seemed to end, though we went up for miles and miles and more miles.

We saw that crazy moon, and did it have an eccentric orbit? It did! It came small over the horizon, and slow. And got smaller, went slower until, even when it set on the horizon that was the apparent top of the hill, it was so distant that we couldn't see it at all!

We pushed on, our mouths open, so absolutely flabbergasted we couldn't say a word. We began to feel lightheaded. We began to make motions that moved us further than we meant them to. We couldn't understand it at all!

And then we saw the automobile, Old Scratch and the kid. Just a tiny black dot way up there, coming toward us at a terrific clip. It detoured swells and small hills, missed boulders and detritus and gullies by hairbreadth turns, coming on as if hell was sitting on its tires!

And then we saw why.

And it sent a chill down our backs as we watched. It was a death race with an avalanche, that was—and *what* an avalanche! It was a mountain of boulders and detritus and talus, and small hills, and it filled the whole horizon.

I stared at it through the windshield, chills racing up and down my spine. The kid drove like mad, and we could see Old Scratch in the seat beside him, his face florid. They were near now, and Old Scratch was making wild, crazy gestures.

What for? I don't think any of us realized that the avalanche was after us too, until Lane suddenly blasted in my ear.

"Wow! Turn the car!"

DID I get it then? I did! I wish you could have seen the way I wrenched that wheel over, started the atom-motor to growling! The battered machine squealed, but she yawed over, went into high, made a neat semicircle and started down the hill. Man, did we let her go! There was the colossal hill stretching below us, and the avalanche behind us, and we *went*.

And the kid came after us, just keeping away from the grinding teeth of a moving mountain by the length of a whisker.

We detoured hills, frantically sought routes around gullies, made hairpin turns, yelled with glee when we hit the straightaway. Sand and rock and pebbles skittered under our screaming tires. We plunged down that planetary mountain side as if the fires of hell were singeing the seats of our pants.

Wilkes pounded me on the back until I started coughing.

"It's catching up!" he blasted. "Faster!"

Faster? Ye gods, what did the man want? We were already doing a hundred and twenty. So I threw more mileage in on top of what I already had. And the hill was growing steeper, and I heard Cummings cursing steadily, profanely, unbelievingly.

I knew he was looking down that unending slope, chopped off in a great circle where sat the frightful, star-sprinkled black horizon. But I was the

driver, and I was looking at that horizon too, and it made my hair stand right up on end to think I was driving into it!

After awhile it became a nightmare. Detour, slam on the brake, scream around impossible curves, start up a hill that ended in a cliff, yaw around, look for a better way out—a straightaway! —and down we'd go.

And I had three mad men in the car with me, so excited they couldn't get scared. Pounding me on the back. Yelling in my ears. Telling me the kid was gaining on us, and that the avalanche was gaining on the kid.

Ye gods, how that avalanche had us at a disadvantage! *It* didn't have to detour! It just took the obstructions along with it.

Everything hazed up. After all, I'd just got out of a sickbed. My hand on the wheel, my feet on the pedals, began just to do the things they had to, without my telling them. So for the last half of the ride, I was just a passenger. And even after the lopsided plain began to level off, I drove like mad.

Lane, Cummings, Wilkes started to cheer like a grandstand of people, all of whom have bet on the right horse, and are right happy about it. They had to take the wheel out of my hands, they had to push in the brake.

When I came out of my daze, the hill was gone—the big one—and the plain was a plain, and not very far away I saw the chain of low hills that circumscribed the plateau on which stood our ship.

Then we got out of the car, and I staggered around like a drunken man, until I saw the kid's automobile come screaming to a stop beside ours. I looked at him, and then I looked in the direction we'd come from.

THE avalanche was gone. As it reached the slow end of the slope, it had begun to lose parts of itself. Finally there had not been any slope to speak of and it had just petered out, dead and gone at the bottom of the five-hundred-mile hillside. Or so I thought. I know what we all felt—Lane, Wilkes, Cummings and I. About the kid, I mean, for exposing us all to the avalanche. We stood around waiting until the kid got out of his car, and I think we all were just waiting for Old Scratch to light into the kid and beat the stuffings out of him.

The kid got out first, his face flushed with excitement. He started toward us, and then stopped when he saw the looks on our faces. He started backing up.

Old Scratch got out of the car. We started to grin all over our faces.

"Now watch the fireworks!" Cummings husked joyfully.

And what started popping was our eyes. And why? Because if this was fireworks, then somebody had lit a whizzer! Old Scratch looked at us and grinned—and then threw an arm around the kid's shoulder!

I couldn't believe it. "But the kid kidnaped you!" I yipped out.

Old Scratch beamed. "Don't I know it? Wow! What a ride! Kidnaping was the only way this here kid could show me what he wanted to show me. It took a hell of a long time for me to get some sense in my head.

"Johnny," he beamed, "suppose you tell these here ignoramuses where that there avalanche come from." He grinned maliciously. And we gaped.

The kid shifted from one foot to another, grinning too.

"It came from the top of the hill," he said, as if that was all he needed to tell us. When we didn't get it, he added what he thought was an explanation.

"That's on the other side of the planet."

"The top of the hill is on the other side of the planet?" I said, trying to be real polite. "Forty-five hundred miles away?"

"Sure," boomed Old Scratch, as if he had known it all along. He began to laugh, his body shaking.

"It's the funniest damn thing I ever run across, so help me, it is! Why, this whole planet is a hill—a mountain—doggoned if it ain't! It's a hill from top to bottom. And the bottom is right where the ship landed—in the center of that ring of hills.

"Them hills is parts of avalanches that rolled all the way from the other side of the planet."

He continued to laugh, until I yelped:

"For Pete's sake, and you in the prime of life! What d'you mean, it's a hill? That we landed at the bottom—"

And then I think I and Lane and Wilkes and Cummings began to get it, and our mouths started to fall open.

THE kid grinned. "Sure," he piped up. "I knew it all along, but you wouldn't listen to me. This world we're on is a big mountain—an off-center planet. The center of gravity isn't in the center of the planet—it's about three hundred miles below the surface. Below our ship, the gravity is greatest."

He was anxious for us to understand now.

"Maybe it's neutronium down there," he suggested hopefully.

I was feeling weak, and I sat down on the running board of our car. I looked at him dazedly.

"Go on, Johnny," I said weakly. "Then all we have to do to get off the planet is to decrease the amount of gravity pulling on the ship."

"Sure," the kid said excitedly. "I told you that, and you wouldn't believe me. The farther you go away from the center of gravity, the less it gets—it falls off as the square of the distance from the center."

He was getting enthusiastic now, and we listened to him tell us how to move the ship. That was because we were so dazed we couldn't talk.

"We use a few of the automobiles in the hold," he said, his eyes shining like a thousand watts. "We put two under the forward fins, two under the rear ones, two in the middle."

"But first we jack the ship up," said Old Scratch proudly, and then looked embarrassed as he realized that was pretty obvious.

"We hitch more automobiles up to the nose of the ship with chains," the kid went on. "Then we carry the ship over the plain and to the hills. There we look for a gap in the hills, and clear away some of the big boulders and get the ship over the detritus of the avalanches—maybe by making a roadway out of some rocks—and then we start pulling the ship up the hill!

"And when we get"—he stopped and his eyes got a preoccupied look, and then came back to us—"when we get the ship 733-point-three-nine miles away from where she is now, why, the gravity'll be exactly three-fourths of a G."

"Go on," I said. It was getting more and more like pretty music, the things he was saying.

"Why, then we can make it!" he said excitedly. "We can use the forward jets, and they'll lift us from three-fourths of a G! That'll take about—about two weeks, maybe. That leaves us thirty days to get to Pluto. And we can make it, too!"

His eyes went toward heaven again, and I thought I began to see mathematical symbols parading across his

cornea. He said, "Yes, we can! I'll compute you an orbit myself!"

Old Scratch began to laugh. It got so he couldn't stop himself.

"He'll compute us an orbit," he gasped, pointing at the kid. *He'll* compute us an orbit! And it takes an expert what's got a dozen years training behind him to do that.

"Now, you listen, Johnny," he said, speaking very kindly. "You're a smart kid to be able to figure this here planet out, but you ain't *that* smart! You let that there job of computing up to me or Sandy or somebody that knows Planck's Constant * from a board."

The kid's cheeks began to burn.

"You guys are the *dumbest* bunch of pickle-pusses I *ever* ran across! Yes, you are! I tell you you're on a collision course, and you crack up, and *still* you don't believe me. I figure out a planet for you, and tell you how to get off, and *still* you think I'm just a dumb kid that can't compute an orbit!

"How do you think I knew this was an off-center planet? Why I *knew* that those hills around the ship were just detritus that had rolled down the hill? The boulders were so smooth, just like they rolled a long way. And I figured the eccentric anomaly** of that moon, and I knew it came in close and went so fast because it had to, where the gravity was greatest."

"You actually figured the eccentric anomaly of that there moon?" said Old Scratch incredulously. "Now don't pull my leg," he added in warning.

"Sure I did! In my head, too. And I figured exactly where the center of gravity was."

We stared at him harder and harder. Things were beginning to click in my head at last! The kid began to flush. He shifted from one foot to the other, the harder we stared at him. He got a guilty expression on his face. He avoided our eyes, like he thought maybe we had something on him.

"I guess you guys got me pinned down," he blurted out finally, and his lower lip began to tremble. "Now I guess you'll send me back to the Philadelphia Science Institution. But I couldn't stand that dry, stuffy old joint. And when I saw your orbit figures on the paper, I knew you were on a collision course. So I sent a telegram to my friend, the President of the United States, and told him I was running away, and then I waited in an alley until your—"

And by that time I had it. I jumped to my feet, yelping to high heaven: *"Georgie Periwinkle!"*

The kid shifted from one foot to the other, embarrassed and ashamed-looking.

There was a big silence, and then everybody started to explode.

"Wow!" Old Scratch yipped out, and his eyes began to bulge.

Georgie Periwinkle, the mathematical prodigy, with six comets, two new planets—three, now—a new subatomic particle, and a mess of miscellaneous inventions to his credit!

Georgie Periwinkle flushed redder and redder while we stared at him.

"So we'll get to Pluto on time," he said, trying to change the subject.

But we kept looking at him, and finally we started grinning all over our fool faces. Georgie Periwinkle! Did *we* feel wobbly!

The kid said, uncomfortably, "And

(Concluded on page 114)

*Max Planck was a German physicist, who first asserted that the energy of radiation is emitted and absorbed in integral multiples of certain indivisible "quanta" of energy which depend on the frequency of the oscillation of the electrons. This law of radiation is called Planck's Constant.—Ed.

**The angular distance of a planet from its perihelion from the sun, which measures apparent irregularities in its movement.—Ed.

The Meteor Miners

By L. A. ESHBACH

Steve Anders was old—but far from useless!

IN the Earth, Venus and Mars Transportation Lines, Inc., men come and go, and are forgotten—many of them in the course of years. But some are remembered—and old Steve Anders is one of them. Men of the E. V. & M. smile when old Steve is mentioned—understanding, respectful smiles, full of admiration for a brave man.

Steve Anders was a meteor miner, one of the first in space—and, in his prime, one of the best. The E. V. & M. was still a dream in the mind of a lad named H. C. MacDonald, as Steve shipped on his first dangerous cruise into the void. At that time, a group of venturesome young men came to the conclusion that there were vast possibilities in salvaging the countless tons of almost pure iron that were flashing through space as iron meteors*, and which could be had for the taking. They had organized The Meteoric Iron Co. Derisively they had been called "meteor miners"—and the name had stuck. Steve Anders was their second employee.

A dangerous job it was, a job for brave men—but it isn't for that that Steve is remembered. Other brave men in other dangerous jobs have long since been forgotten. Forty eventful years passed before Steve Anders won his place in the hearts of his fellow workers.

In the interim, H. C. MacDonald organized the E. V. & M., and started it on its steady growth in power and size. In the course of time commercial contracts were made with the inhabited satellites of Jupiter and Saturn—and the demand for iron immediately exceeded the available supply, for iron was a rare element on those smaller, lighter bodies. With customary foresight, H. C. MacDonald bought *The Meteoric Iron Co.*, and made it a brance of the E. V. & M.

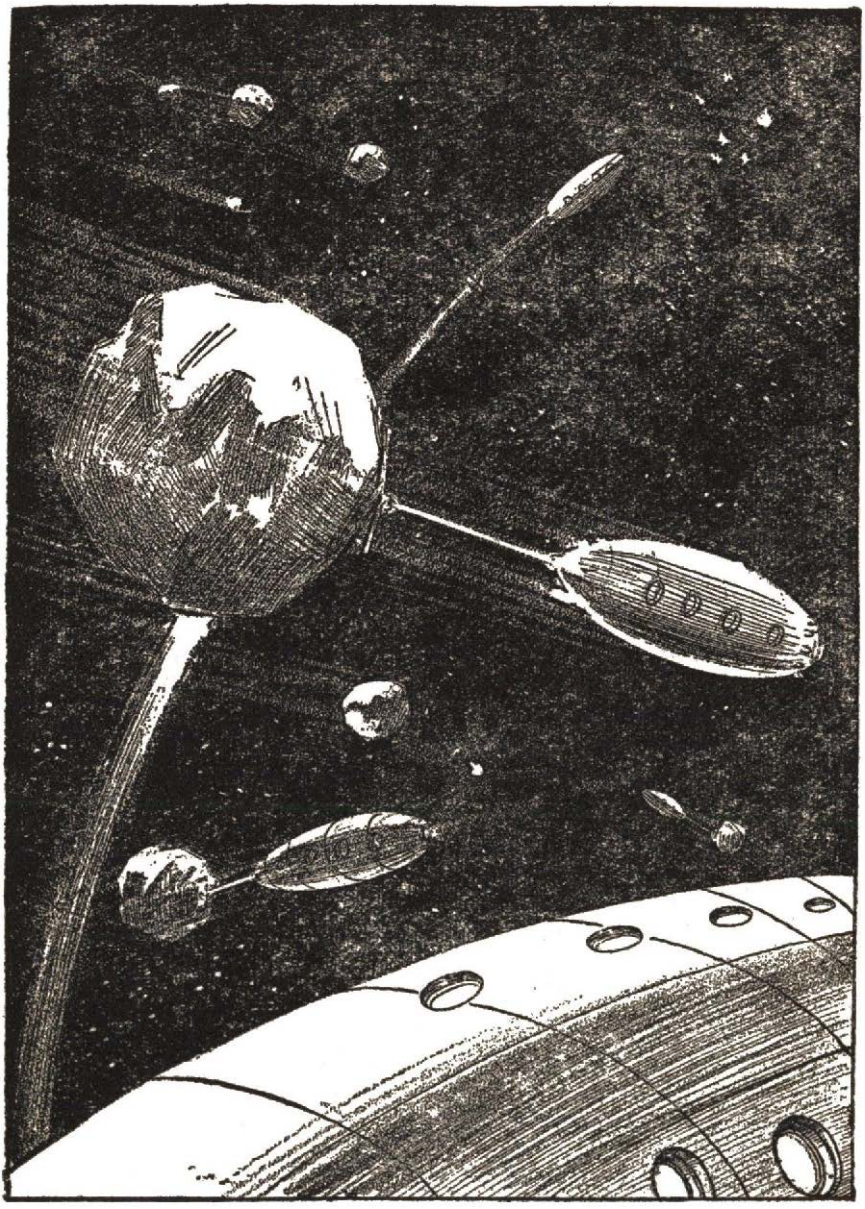
Occasionally Steve Anders left space for a job on earth—but he always returned. It was during one of these periods of absence that "Meteoric Iron" changed hands—and Steve could not come back. Applying to an E. V. & M. employment manager for a job, he met with a curt refusal; meteor mining was the most dangerous industry in space, he was told, and not a job for old men! Steve went away with bowed head.

Ten years passed, and—but that's the story.

There goes the starting bell; they're closing the airlocks . . . and we're off!

* Meteors are roughly divided into two groups—stone and iron meteors. The iron meteors—or meteorites, as they are called after they fall to earth—are exhibited in museums, and are the more numerous to be found there, but this is because they are the more easily identified. The stone ones outnumber them by about twenty to one.

Iron meteors are nearly pure iron with usually a small admixture of nickel. Stone meteors also contain grains of iron, as well as numerous other elements including gases—but these held no interest for the meteor miners.



A TALL, powerfully built man with close-cropped black hair, and black eyes that when occasion demanded, could become *coal* black and seem to lose their pupils, sat in the private office of H. C. MacDonald, president of the E. V. & M. He was Captain Cal Barker, the fifty-five-year-old commander of the fleet of Meteor Miners. A grim, stern-visaged man was Barker, a man who had fought his way to his present position by sheer force of determination—and, at times, by efficient use of two battering-ram fists. His nature had a softer side, but it rarely came into view.

It was October, and he was discussing with his superior the forthcoming departure of the fleet for the Andromids*, the swarm of meteors which touched earth's orbit, between the seventeenth and twenty-seventh of the following month. The cruisers would follow the path of the swarm for three months, stowing meteoric iron into their holds, then return to earth with their haul, unload, outfit their crafts for another voyage—and head out into space in search of another meteoric swarm.

Suddenly the sound of a buzzer broke in upon their conversation, and the short-clipped sentences of a secretary came through a radiophone. "A visitor to speak with Captain Barker. He is very persistent—insists on seeing you. His name is Stephen Anders. An old man, poorly dressed—shall I permit him to pass?"

Captain Barked frowned. "Stephen Anders," he muttered. "That name sounds familiar. Steve Anders . . . By damn!" he exploded, his face losing its customary sternness, "old Steve Anders! Show him in—show him in!"

A moment later the door opened and old Steve Anders shuffled in, nervously twisting a battered derelict of a hat in his gnarled hands. Sparse white hair covered his head, and countless wrinkles creased the skin of his face that was not concealed by his thatch of short, snowy whiskers. His seventy-odd years of life rested heavily upon his bent shoulders as he paused inside the door, his faded, blue eyes shifting almost apprehensively from Captain Cal Barker to H. C. MacDonald and back again.

Abruptly the Captain leaped to his feet, a smile of genuine pleasure on his face. He caught the old man's hand and wrung it warmly.

"Old Steve Anders! You space-eater you! Where've you been keeping yourself for the last fifteen years? Somewhere on Mars or Venus, I'll bet, prospecting! I'm glad to see you, Steve, glad to see you! Come on, man, open up your airlock!"

Steve Anders smiled his appreciation, tears filling his watery old eyes. He had become so accustomed to hard knocks during the last ten years that a kind word meant much to him.

"I don't like to bother you, Cal—Cap'n, sir. I thought maybe you'd forgot me—but I just took a chance." His voice was thin and quavering, older, it seemed, than the man himself. Yet, somehow, there still clung to it a suggestion of former power.

"Forget you!" Captain Barker exclaimed. "Forget Steve Anders!" He turned to H. C. MacDonald. "This is the man, sir, who taught me what I know about meteor mining. Twenty years ago he was the best man in the game, sir—barring none· and I worked with him, a raw, space-shy recruit. For two seasons we were high craft for tonnage—and it was all Steve's doings!"

H. C. MacDonald looked at the old man with new respect in his eyes. "Some

* A swarm of meteors moving around the Sun on an elliptic orbit, possessing a period of 6.6 years. According to popular astronomical belief, the Andromids are the remains of Biela's comet which in 1846 divided into two, and subsequently disintegrated, to form a swarm of meteors. This particular swarm, like others that touch the orbit of the earth, was named for the constellation—Andromeda—from which it appears to radiate, i.e., its radiant.

record," he commented. "I've watched meteor men at their work—and it's not a soft snap, by any means."

CAPTAIN CAL BARKER snorted. "Soft snap! Huh! What you watched *is* a soft snap compared to meteor mining in the early days. Today we use magno-bars, separated from the space boats by fifty or a hundred feet. In those days we magnetized the outer steel shell of the cars, and used them to pull the meteors from their course. Lots of fun edging up to a mass of iron flashing through space at the rate of twenty-six miles a second—I don't think! And that's their average speed. A little jump in the wrong direction—and your boat was smashed to bits . . . And we didn't have atomic power in those days, either, we used rockets! Soft snap! Humph!"

"Say, Cap'n, sir," old Steve interposed rather timidly, "I still got the old boat! Bought her when they changed over to these new contraptions, and had her stowed away. They was goin' to scrap her—the best little craft that ever rode the sky-lanes"

"You would, Steve, you would! The way you polished that tank! You thought more of her than anything else—next to your wife." The Captain's voice softened. "How is your wife, Steve? Passed away?"

The old man drew himself up proudly. "No, Cap'n, she's spry as ever. Gettin' on in years—but she's still waitin' for me to settle down, sir. An'—an' that's why I came here to see you.

"Twenty years back, Cal, my lad, we worked together—an' I was wonderin' if we couldn't do it again! You see, I'm tryin' to make enough money to last me an' Sarah the rest o' our days. Ten years ago I tried to get back to meteor minin'.—but they said I was too old. It's not so, Cap'n; I'm as good a man as I ever was—even if my hair has turned white!

"I tried prospectin' on Venus, but it's pretty hard lines—not my kind o' work—I don't feel at home on land. Tried other things, always on my own, but I can't seem to do any savin' just make enough to keep me an' Sarah goin'. An'—an' I won't take charity!

"When I found out that you was in charge of the Iron Fleet, I figured maybe you'd maybe give me a chance, Cap'n, to make my pile so I can settle down. I—I'm as good a man as I ever was!"

Captain Barker frowned blackly—but not because he felt like frowning. He did it to conceal the sudden unwonted emotion that had stirred him. Steve Anders was old—old and well-nigh useless—but he wouldn't admit it, not even to himself.

"Steve," Barker said gruffly, "I think I can do something for you. Drop around to the fleet's quarters at the space-port about nine to-morrow morning, and ask for me. I'll be there."

"Thank you, Cap'n—I'm mighty grateful! I knew you was enough of a space man to stick to an old pal." Sudden eagerness entered his voice. "An' when we leave for the swarm, sir, I'll take the old car along! Still got her loaded with fuel, Cal—Cap'n, sir. An' we'll show 'em what a real haul is!" He laughed happily. "They said I was done for—but I'm still good for quite a few years." And mumbling his thanks, old Steve Anders shuffled out through the doorway, one of those pathetic derelicts, tossed aimlessly about by the tides of life.

For several moments after the old man's departure, there was silence in the office of H. C. MacDonald. Then the president of the E. V. & M. ran his fingers through his bristling gray hair and cleared his throat.

"Well!" he exclaimed finally.

Captain Cal Barker peered at MacDonald from under heavy black brows, a truculent light entering his eyes. "Well," he returned, "what of it? Sure; I know I acted like a softie! I admit he's a failure—should have saved his money for his old age! Of course he's worn-out, done for! But I don't give a damn!

"When a man's served his life in space—given all he's had to the sky-lanes, he deserves something in return, doesn't he? I worked with Steve Anders in his prime—a square, two-fisted man if there ever was one—and I owe him a lot! Think I'm going to turn him down now? No, sir! not for any man!

"And that wife of his—finest woman I ever met! She's waited all these years for him to come home with his roll and settle down. He'll get his chance to do it, or my name's not Cal Barker!"

H. C. MacDonald nodded slowly, a faint smile on his lips. "I didn't say anything, did I?" he asked.

"Well—" the Captain began, then paused, watching the big boss of the E. V. & M. He had seized a pen and was writing rapidly. After a moment he arose with a slip of pink paper in one hand; wordlessly he gave it to Barker.

"Your personal check for ten thousand dollars!" the latter exclaimed. "Payable to Stephen Anders . . . By —by damn, that's white of you! But—" he shook his head regretfully, "but that isn't the way. He wouldn't accept it! I know him—and I know he wouldn't take a cent that he hadn't earned." He crushed the check in his hand and dropped it on the desk.

"Then what'll we do?" H. C. MacDonald queried gruffly. "He can't earn his way—no question about that! An' we can't ship him as a miner—it'd be sure death for the old man. What's your idea?"

Captain Cal Barker frowned reflectively. "Well, I know one way we can work it. We'll ship him as assistant to the boat dispatcher. All he'll have to do is watch the visiplates, and warn the meteor men if there's any danger, or if they're going too far. And Steve'll rate a higher pay than he would as a miner."

Slowly H. C. MacDonald inclined his head. "Guess it'll work that way," he agreed as the Captain arose to leave. He gripped the other's hand. "Good luck on the voyage. Report when you get back."

"Thanks," Captain Barker returned, his face assuming its normal grimness. "I won't see you before we leave; be too busy." And with that he passed from the room.

H. C. MacDonald sank into a chair, and stroked his chin thoughtfully. "It's tough to be old," he murmured at length, "but it's hell to be old—and useless!"

IN wedge formation the thirty-three cruisers of the Meteor Fleet flashed through space toward the Andromids. The space ship *Atlas,* with Captain Cal Barker in command, formed the apex of the wedge. They would maintain that formation until they reached the meteoric swarm then they would separate and spread out over the Andromid's orbit, to reunite three months later for the return to earth.

Old Steve Anders was on board the *Atlas,* clad in the conventional E. V. & M. blue. Smooth-shaven, more erect, his appearance was changed slightly, but he was nevertheless an incongruity among the members of a crew whose ages averaged thirty or thirty-five years.

Old Steve was unhappy. True, he was glad to be back in the vaults of space, glad to feel the rush of acceleration as the cruiser sped through the

void, glad to see the starry blackness sweeping past the portholes—but he felt that he had had a submit to a gross injustice at the hands of Captain Barker. He, one time champion of the Meteor Fleet, chained to the cruiser while the miners would speed away to the excitement of the chase in their little, two-men boats! He, Steve Anders, assistant dispatcher! It was ridiculous! They had permitted him to bring his old craft along—but they wouldn't let him use it! And he was just as good a man as he ever had been.

Hugo Mott, the Dispatcher, a little, light-haired man of about twenty-five with a big voice and a white liver—so Steve had decided when he met him—noticed his assistant's gloom.

"Come on, old-timer," he bellowed, "snap out of it! What ails you, anyway? You look like one of those Venerian death-worms was chewin' at your guts!"

Old Steve scowled distastefully. He didn't want to talk with this noisy little vacuum-head. But talking might help anyway.

"Well, if you must know," he complained in a thin voice, "I think it's a shame that Cap'n Barker didn't have sense enough to ship me as a miner. Me, Steve Anders, an inside man! I'd show 'em all somethin' if they'd let me go."

"Yeh?" Mott sneered. "You don't seem to realize that they're savin' your life for yuh by keepin' yuh in this boat. It'd be suicide for you to go out in that old rocket kettle I saw 'em stow in one of the boat racks. Besides, you're pullin' down more money than the miners are—without a risk." He paused an instant to emit a hoarse laugh, then swept his hand about, indicating the double row of televisor screens. "This is a soft job compared with that . . . And you can't seem to get it through your dome that you're done for! I'm surprised that they gave you a berth at all. Barker must be crackin' up; never did have much sense anyway."

Sudden resentment flared up in old Steve Anders, and a hurt look came into his eyes. Then he shrugged his shoulders and turned away. What was the use! It was always thus—had been from the outset. The men had joked about his old boat, and in defense he had told some of the things that the old craft had done—and they had laughed! He'd show them—by God, he'd show them!

Then he shook his head sorrowfully. He'd never get a chance to show them. Within a few hours they'd reach the Andromids, the fleet would break up, and he'd start on his routine, inside job.

Suddenly Steve whirled in his tracks, the sound of an angry voice in his ears—Captain Cal Barker's voice. The latter had entered.

"So I'm cracking up, am I, Mr. Mott? Never did have much sense, anyway, eh? Be a little more careful, hereafter, what you say, and where you say it!" With the words a hard fist crashed against Hugo Mott's jaw and sent him sprawling. "If you weren't such a good man at the screens," Barker continued in an icy voice, "I'd see that you had your space license taken from you for that. I'll have discipline on board my ship!"

The Captain turned to Steve. "Mr. Anders, we'll hear no more about that old rocket boat of yours. It may cause trouble—and we must have discipline!"

"Yes, sir," old Steve replied.

After Barker had gone, Mott crawled to his feet, caressing his jaw and mumbling curses. Steve saw an ugly, sullen light in his close-set black eyes.

"I'LL get him for that," the little Dispatcher muttered—and glanced

fearfully over his shoulder as the words left his lips.

Steve Anders looked at him with scorn in his glance. "Dirty little rat," he thought. "Yellow clean through."

Within the next two hours the incident in the televisor room passed from the mind of old Steve Anders. A nervous tension gripped him. For they had almost reached the orbit of the Andromids. More, they were approaching the main body of the swarm, what had been the head of Biela's comet, until it had broken up almost two centuries before.

Even now the fleet was separating at Captain Barker's orders. In the big visiplate Steve watched them go. One after another they sped away, vanishing in the blackness. Finally all were gone, searching out different portions of the swarm's orbit, and the *Atlas* flashed alone through space.

Suddenly bells rang out through the great, cylindrical space ship—a signal. The meteors lay below them! No man could see them, but delicate detectors revealed their presence on the space charts.

In a moment th. chambers of the *Atlas* hummed with activity. The meteor miners rushed for their respective two-men crafts, stored in the boat racks near the base of the cruiser, and prepared for their first excursion into space. As they finally closed their airlocks, each crew switched on their radiophones and visiplates; and in the Dispatcher's room twelve screens flashed into life. Each bore an image of the corresponding meteor car resting in its rack; and beside each screen was a dial that would record the distance separating the smaller craft from the big cruiser.

When all were ready, Mott released them one by one, and under their own power, each towing a huge iron bar, wound with insulated wire, they darted into the void.

Watching the screens, old Steve Anders saw them speed into the swarm, find iron meteors, and begin the struggle to check their flight—and a great ache gripped his throat. It wasn't fair! They wouldn't give him a chance.

With his eyes he followed one of the craft in its efforts. Now it was creeping up beside a jagged mass of metal. Suddenly the iron bar leaped out against the meteor as the crew sent a current through its coils, transforming it to an electro-magnet. The cable tautened; and the car and the meteor sped along side by side.

Slowly the men reduced their pace, arresting the speed of the spatial missile. Slower, steadily slower—and the thing was accomplished. With the mass of Meteoric iron held fast to the steel bar, they moved on, searching for a second victim. One, or possibly two more meteors they'd secure, depending upon their size, then they'd return to the *Atlas*.

That was the life! Old Steve watched the visiplates enviously. Of course, all the captures weren't that easy; occasionally big meteors pulled the cars along—could not be stopped. Sometimes another car had to assist—and sometimes masses of iron had to be abandoned by reversing the current in the magnet coils . . . Steve Anders sighed. He wanted to be out there too!

Suddenly a harsh voice broke in upon his thoughts. "I'll bet you're glad now that you're safe inside the *Atlas*." It was Hugo Mott. "Bein' old has some compensations, eh? Look at the risks them fools is takin' out there. Not for me, Old-timer!"

A hot retort sprang to Steve's lips, but he checked it as his eyes caught the figures on one of the distant dials.

"Number six is past the safety limit," he said.

"Right!" Mott grunted. He turned a dial; spoke into a radiophone: "Number six has gone too far. Turn back."

The work in the televisor room was largely a matter of routine. Mott and Steve had to watch the twelve illuminated screens, six on one wall, and six on the other, and periodically record what took place in space. There were two other screens, one on either side, screens for boats that were kept in the Atlas for emergency use—and a larger screen connected with apparatus in the control room, which revealed the surroundings of the *Atlas* itself. The latter likewise received some of Mott's and Steve's attention, and was the subject of written records.

This constituted all their duties—except when an emergency arose. Then the Dispatcher took complete charge of the cruiser and its smaller craft, issuing orders even to the pilots. Only the Captain was over the Dispatcher at such times, for on the latter rested the safety of the men in the small boats.

Old Steve wondered repeatedly how Mott had secured—and held—so responsible a position. "Cal must be losin' his sense of judgement," he told himself.

THE first month that the *Atlas* spent in the orbit of the Andromids passed uneventfully. Meteoric iron piled up steadily in the hold of the space ship; and Captain Cal Barker saw visions of a most satisfactory expedition. Radio reports from the other cruisers indicated that they were having similar returns.

But at the beginning of the second month, the Atlas encountered an unbroken streak of misfortune. It began when one of the small boats crashed into a gigantic meteor, smashing itself into a shapeless mass of metal, and instantly killing its crew. It was the result of carelessness on the part of the miners themselves—but it threw a cloud of gloom over the rest of the men. Bad luck, they said, always followed a smash-up.

And bad luck came with a vengeance. For some unaccountable reason the nature of the swarm changed. There were meteors in great quantities—but few were iron meteors—the majority were worthless stone meteors. And the iron meteors that were seen were either too small to bother about, or too large to handle.

After a week of futile effort, Captain Cal Barker became a fighting, cursing fury. There was a stubborn quality in his nature that leaped to the surface when adverse conditions arose, a quality that permitted nothing to stand in his way. Restlessly he strode through the Atlas, from the pilot room in the nose of the cruiser to the engine room in its base, possessed of a cold, unreasoning anger.

His crew responded with frenzied efforts, taking chances that they would not have considered ordinarily—but all to no avail. The pile of iron in the hold increased with disheartening slowness.

In a rage Captain Cal Barker drove the *Atlas* into the heart of the swarm; and just as furiously as he drove his men. He raged about within the cruiser like one demented. Not good space ethics—but entirely in keeping with Cal Barker's nature. And it did no good.

Old Steve Anders watched the turn events had taken with slowly mounting hope. Perhaps he'd get his chance now! Accordingly, after a period of particularly arduous but ineffectual effort on the part of the crew, he sought for the Captain.

"Cap'n Barker, sir," he began somewhat hesitantly, his voice quavering despite the eager glow in his faded eyes, "things haven't been goin' so good lately, so I thought maybe—maybe you'd let me take the old car out, an' —an' do what I can! Every man

counts, sir; and Mr. Mott can get along without me. It isn't askin' much, sir, and I . . ."

His words trailed off into silence as he caught Captain Barker's changing expression. His eyes seemed to snap fire from their coal black depths, seemed to lose their vision; his heavy eyebrows drew together in a fearsome frown; and his wide, powerful jaws were clamped together, his lips compressed, and his nostrils dilated, as he strove to control himself. When he spoke, finally, every word was clipped off as thought by a knife.

"Steve, if it had been anybody but you I'd knock 'em head over heels into a corner! Bother me with your foolishness at a time like this! Listen, Steve; you know me! Think I'd have put you inside if I'd thought you capable of running a boat? We had one smash-up; we don't want another! No, Steve, it can't be done—so *forget it!*"

Shoulders sagging sorrowfully, Steve Anders turned away.

"Steve!" He turned at Barkers' exclamation. "You're right about one thing. Every man counts. So *I'm* going out with the men! Tell Hugo Mott. And, by damn, I'll bring in iron!" With a final imprecation, he whirled and ran down the spiral hallway toward the space car racks.

Mechanically Steve Anders returned to the Dispatcher's room, and delivered the Captain's message.

"Another fool—bigger than the rest," Mott remarked with a sneer. "Thinks he can do better than anybody! In a pig's eye!"

Old Steve paid little attention to his superior's tirade; he was accustomed to it. A few moments later as one of the emergency screens lit up, he watched with interest—and a shade of resentment. The Captain had usurped his place—the place of the one-time champion of the fleet!

Out into space Captain Barker's craft flashed, trailing the steel bar. He was alone; he had no assistant. And he began bringing in iron—iron in surprising quantities. He captured meteors of seemingly impossible size; he thrust himself into dangers with a daring that appeared to be the height of folly—and escaped. He seemed to possess a charmed life, and acted as though he knew it. Tirelessly, hour after hour he toiled, setting a pace for his men.

Old Steve Anders watched anxiously. The Cap'n shouldn't be taking such chances. He was a little harsh at times, but he was a prince, nevertheless. His old pal. "He'll get into a smash-up, actin' like that," Steve muttered. "Shouldn't have left him go—I've had much more experience than im—and these new boats can't stand up against the old ones."

HEY, Old-timer," Hugo Mott growled, "can the chatter! What're yuh excited about? . . . Look—look at that old fool go! He'll spill his guts all over the sky, if he don't watch out. Well—I won't do much weepin'!"

Now the Captain was coming in again with a huge meteor fast to his steel boat. And the others were returning more frequently to deposit their hauls. Back—then out again . . .

"Call in the men! Call in the men! Hurry!" A voice came through the radiophone from the control room. "We've sighted a comet—computed its path—and it intersects the orbit of the Andromids at this point. It's big enough to send us all to Kingdom Come!"

With a frightened scream, Mott pointed toward the big visiplate at the end of the room. "Look at it! My God, look at it!" His face was a sickly yel-

low; he cringed with cowardly dread.

A comet unquestionably was rushing toward them; Steve saw it on the screen. A gigantic thing, a mass of incandescent gas, rock and metal, its brilliance, magnified by the finder, was almost blinding.

Steve spun around on his heel, his figure suddenly filled with youthful animation.

"Quick," he exclaimed, "call in the boats. There's not a second to spare!"

Hugo Mott made no move. His fear seemed to have anchored him to the floor. "We—we gotta get away," he gasped.

Old Steve brushed past him contemptuously and sprang to the master radiophone. He threw in the switch, and sent his message to the twelve crafts in space.

"Back to the *Atlas*, men! We're in the path of a comet—it's due to strike in a short time. We'll have to move—fast!"

With the words old Steve leaped back to the visiplates. The men were returning with all possible speed. Some had not needed his warning; they had seen the spot of brilliant light rushing toward them, and had grasped its portent. All were returning—all, save . . . Old Steve gasped in consternation.

The Captain! Had he gone insane? For suddenly his steel rod had leaped out at an enormous passing meteor—a monster that must have weighed hundreds of tons. And it flashed along at a terrific pace, taking the Captain's boat with it! It seemed to be speeding directly toward the point where the heart of that onrushing comet would strike!

Leaping to the radiophone, Steve cried in a frenzied voice: "Captain—number thirteen—come back to the *Atlas!* It's sure death unless we get away at once!"

And from boat thirteen came the reply, strangely calm, "I can't, Steve,—can't let go! The damned thing seems to be magnetic—just grabbed me and started pulling me along. And it's far too big for one boat to handle. Soon as the others get back, have the pilots get the *Atlas* out of the comet's path. So-long, Steve!"

As old Steve stared at the radiophone in stunned silence, Hugo Mott sprang into action with an eager snarl. His face was pale and beaded with perspiration.

"They're all in now!" he cried. "We'll be outa this jam in a minute!" He called the control room and began issuing orders.

"Wait, Mott," Steve interrupted, gripping the other's arm. His thin voice shook with emotion. "You can't leave the Captain like that! We gotta—"

"Can't, eh? Who said so? Let go my arm, you crazy fool—we gotta get out of this now! If Barker burns out, that's his funeral, not mine! He has it comin' to him, anyway, the damned fool! *Get out!*" With a single, furious sweep of his arm he sent the old man crashing into a bank of televisor screens.

Slowly Steve arose, supporting himself with out stretched arms—and the fingers of his right hand closed on a steel rod that his body had torn loose. Suddenly he straightened; his jaws clamped together. By God, they wouldn't leave Cal Barker—not if he could help it!

With a single bound he reached Mott's side, and the steel bar crashed against the back of the Dispatcher's head. His knees sagged and he sank to the floor.

"CANCEL those orders," Steve called to the control room; and there was no waver, no hesitancy in his voice. "The Captain hasn't come back yet, so we can't go. Full speed ahead along the Andromids' orbit. Slow down when you see me leave the ship!"

A moment later Steve Anders was

running rapidly down the spiral hallway toward the boat racks. He—he'd show 'em what that old boat could do—and bring in the Cap'n at the same time!

As he ran Steve calculated hurriedly. He had noted the Captain's distance from the Atlas; he knew the approximate speed of the cruiser and the meteor . . . they'd reach the boat in about three minutes. He'd have to work fast—but there was still time to make it!

He dashed through a wide doorway past several returning meteor men, and crossed to his old steel-jacketed rocket boat. He passed through the open airlock, clamped it into place, and with roaring rocket vents, sent his craft toward the ceiling and the vacuum tunnel. The removal of the boat's weight from the rack had automatically opened the airlock, he passed through it; it closed behind him—and he was out in space.

Anxiously Steve looked through a little porthole, searching for the Captain and his meteor. He sighted them—far ahead—and sent his craft roaring after them.

A wave of misgiving passed over old Steve. At closer range that jagged mass of iron looked incredibly large! And that comet was drawing dreadfully close! For a moment his courage almost failed him; he felt suddenly very old and weak. Perhaps—perhaps he wasn't as good a man as he had been at one time! For an instant he wished that he were back home with his Sarah, away from all this danger. He thrust the thought from his mind. The Cap'n had to be rescued!

With all the skill of former years, old Steve Anders eased his craft toward the meteor, on the side opposite the Captain. The thing drew him toward it; it was magnetic, as Barker had said. At the proper moment he closed the switch that magnetized the steel bar—and clung to the mass of metal. Then, just as he had done it countless times before, he checked his speed with rocket charges from the nose of the craft.

Could he do it? The Captain's boat was holding back too—would their combined power be great enough? . . . Old Steve breathed a sudden sigh of relief. They were slowing down! They would only need a few more moments to check it entirely. But was there still time! What about the comet?

He cast a glance through a porthole. The incandescent mass was almost upon them! But the *Atlas*—it was closer; and the great airlock into the hold was open! The pilot had been following, and had divined his intentions.

A rush for the airlock—a sudden jar of acceleration as the *Atlas* got under way—and the cruiser was speeding out of the danger zone, bearing old Steve Anders and his Cap'n to safety.

Behind them flashed the comet, its head a brilliant mass of fire. It moved with terrific speed—but the *Atlas* moved even more rapidly. Then ran before it, then turned away from its path, and watched it vanish into the blackness, trailing its fan-shaped, wraithlike tail.

ABOUT twenty minutes later a group of men gathered in the mess hall. Every member of the *Atlas'* crew was there except the pilots and the engine men. Captain Barker, Steve Anders and Hugo Mott stood in the center of a rough circle.

"Boys," Captain Barker announced grimly, "we've all just escaped from a tight corner—and I was pulled out of a tighter one—but that's past. We're getting iron—and we're going to continue getting iron. But I didn't call you here to tell you that. I want to introduce you to two different types of men."

He faced the cringing figure of the Dispatcher. "Mott," he said coldly, "you must have forgotten that radiophones and visiplates work both ways. I saw and heard everything that went on in the televisor room while I was being towed along by that meteor! You're a skunk, Mott, a dirty, yellow skunk, to hit an old man! Your uncle was one of the best men who ever held down a Dispatcher's job, and he asked me to give you a chance—and I did. But you won't get another! You'll finish the next month and a half with the cook, as roustabout—at roustabout's wages—and the cook has my sympathy. I'll take your place as Dispatcher. And after that, you'll get out of space—and stay out!"

Captain Cal Barker's expression softened as he turned toward Steve Anders. "And here, boys," he exclaimed, "is one of the finest meteor men who ever set foot on a space boat! I worked under him years ago, boys, when he was the champion of the Meteor Fleet. Maybe he's not so young any more, but, by damn—he's as good a man to-day as he ever was!"

The chorus of assent that arose was enough to warm any man's heart. Old Steve Anders smiled happily.

AS for the rest of the cruise, old Steve spent it with the meteor miners, towing in iron. And afterward—well, afterward he went back to his patiently waiting Sarah with enough money to last them the remainder of their lives.

When H. C. MacDonald heard about the experience of the *Atlas*, he ran his fingers through his shock of gray hair, and frowned thoughtfully. "Hmmm!" he murmured. "It may be tough to be old—when you're useless. But I know one man who doesn't fit that rule at all!"

Men come and go in the E. V. & M.—and are forgotten. But some are remembered—and old Steve Anders is one of them.

THE END

A Vision of Venus

By OTIS ADELBERT KLINE

The purple of nobilty was his if Lotan succeeded in his mission. Then, flying over the venerian jungle, disaster struck!

Illustrated by MOREY

DR. MORGAN, scientist and psychologist, stared fixedly into the crystal globe before him, as he sat in the study of his strange mountain observatory.

For many years, he had been communicating with people on Mars and Venus by means of telepathy, and recording these communications.

Just now, he had established *rapport* with Lotan, a young plant hunter for the Imperial Government of Olba, the only nation on Venus which had aircraft. He was seeing with Lotan's eyes, hearing with his ears, precisely as if this earthly scientist were Lotan the Olban. The electrodes of his audiophoto thought recorder were clamped to his temples, and every thought, every sense impression of Lotan's was, for the time, Dr. Morgan's.

Lotan's little one-man flier was behaving badly. He had just come through a terrific storm in which he had lost his bearings. His navigating instruments were out of commission and his power mechanism was growing weaker. It would be necessary for him to land and make repairs, soon.

For many months he had sought the *kadkor,* that rare and valuable food fungus which had once been cultivated in Olba, but had been wiped out by a parasite. His sovereign had offered him the purple of nobility and a thousand *kantols* of land, if he would but bring him as many *kadkor* spores as would cover his thumb nail. But so far his quest had been fruitless.

Far below him the Ropok Ocean stretched its blue-green waters for miles in all directions—a vast expanse of sea and sky that teemed with life of a thousand varieties. There were creatures of striking fantastic beauty and of terrifying ugliness. A number of large, white birds, with red-tipped wings and long, sharply curved beaks, skimmed the water in search of food. Hideous flying reptiles, some with wing-spreads of more than sixty feet, soared quite near the flier, eyeing it curiously as if half minded to attack. They would scan the water until they saw such quarry as suited them, then, folding their webbed wings and dropping head first with terrific speed, would plunge beneath the waves, to emerge with their struggling prey and leisurely flap away.

The sea itself was even more crowded with life. And mightiest of all its creatures was the great *ordzook,* so immense that it could easily crush a large battleship with a single crunch of its huge jaws.

But these sights were no novelty to

Lotan, the botanist. What he hoped to see, and that quickly, was land. Failing in this, he knew by the way the power mechanism was acting, that he would soon be compelled to settle to the surface of the Ropok probably to be devoured, ship and all, by some fearful marine monster.

Presently he caught sight of a tiny islet, and toward this he directed his limping ship with all the force of his will. For his little craft, which looked much like a small metal duck boat with a glass globe over the cockpit, was raised, lowered, or moved in any direction by a mechanism which amplified the power of telekinesis, that mysterious force emanating from the subjective mind, which enables earthly mediums to levitate ponderable objects without physical contact. It had no wings, rudder, propeller or gas chambers, and its only flying equipment, other than this remarkable mechanism, were two fore-and-aft safety parachutes, which would lower it gently in case the telekinetic power failed.

Normally the little craft could travel at a speed of five hundred miles an hour in the upper atmosphere, but now it glided very slowly, and moreover was settling toward the water alarmingly. Lotan exerted every iota of his mind power, and barely made the sloping, sandy beach when the mechanism failed altogether.

As he sprang out of his little craft, Lotan's first care was for his power-mechanism. Fortunately the splicing of a wire which had snapped repaired the damage.

HE looked about him. At his feet the sea was casting up bits of wreckage. It was evident that a ship had gone to pieces on the reef—the work of the recent storm. The body of a drowned sailor came in on a comber. But it did not reach the shore, for a huge pair of jaws emerged from the water, snapped, and it was gone. In the brief interval he recognized the naval uniform of Tyrhana, the most powerful maritime nation of Venus.

Then his attention was attracted by something else—tracks, freshly made, leading from a large piece of wreckage across the soft sand and into the riotous tangle of vegetation that clothed the interior. They were small—undoubtedly the tracks of a woman or boy.

Lotan followed, resolved to try to rescue this marooned bellow-being, before taking off.

He plunged into a jungle that would have appeared grotesque to earthly eyes. The primitive plants of Venus, which bear no fruits, flowers nor seeds, but reproduce solely by subdivision, spores or spawn, assume many strange and unusual forms and colors. Pushing through a fringe of jointed, reed-like growths that rattled like skeletons as he passed, he entered a dense fern-forest. Immense tree-ferns with rough trunks and palm-like leaf crowns, some of which were more than seventy feet in height, towered above many bushy varieties that were gigantic compared to the largest ferns of earthly jungles. Climbing ferns hung everywhere, like lianas. Creeping ferns made bright green patches on the ground. And dwarf, low-growing kinds barely raised their fronds above the violet-colored moss which carpeted the forest floor.

The trail was plain enough, as the little feet had sunk deeply into the moss and leaf-mould. It led over a fern-clothed rise to lower marshy ground, where fungus growths predominated. There were colossal toadstools, some of which reared their heads more than fifty feet above ground, tremendous morels like titanic spear heads projecting from the earth, squat puff-balls that burst when touched, scattering clouds of tiny black spores, and grotesque funguses shaped like candelabra, corkscrews, organ pipes, stars, fluted funnels and upraised human hands.

But Lotan gave no heed to these. To him they were quite commonplace.

AS he hurried along the trail, there suddenly came from the tangle ahead a horrible peal of demoniacal laughter. It was quickly echoed by a dozen others coming from various points in the fungoid forest. He dashed forward, gripping his weapons, for he recognized the cry of the hahoe, that terrible carnivore of the Venerian jungles. It had discovered a victim and was summoning its fellows.

Like all Venerian gentlemen, Lotan wore a tork and scarbo belted to his waist. The tork was a rapid-fire weapon about two feet long, of blued steel. It was shaped much like a carpenter's level, and fired by means of explosive gas, discharging needle-like glass projectiles filled with a potent poison that would instantly paralyze man or beast. The scarbo was a cutting, thrusting weapon with a blade like that of a scimitar and basket hilt.

As he abruptly emerged into a little clearing, he saw a slender, golden-haired girl who wore the silver and purple of nobility, clinging to the cap of a tall fungus. Below her, snarling, snapping and leaping upward, were a half dozen *hahoes*, huge brutes somewhat like hyenas, but twice as large as any hyena that ever walked the earth, and far more hideous. They had no hair, but were covered with rough scales of a black color, and mottled with spots of golden orange. Each beast had three horns, one projecting from either temple and one standing out between the eyes. Two of them were gnawing at the stem of the fungus, and had made such headway that it seemed likely to topple at any moment.

With a reassuring shout to the frightened girl, Lotan whipped out his scarbo, and elevating the muzzle of his tork, pressed the firing button. Horrid death-yells from the *hahoes* followed the spitting of the tork, as the deadly glass projectiles did their work. In less than a minute four of the brutes lay dead at the foot of the fungus, and the other two had fled.

But during that time, brief as it was, another flesh-eater of Venus, far more fearful than the *hahoes*, had seen the girl and marked her for its prey.

As Lotan looked upward, about to speak to the girl, she screamed in deadly terror, for a man-eating *gnarsh* had suddenly swooped downward from the clouds. Seizing her in its huge talons, it flapped swiftly away.

Lotan raised his tork, then lowered it with a cry of despair. For even though he might succeed in killing the flying monster without striking the girl, a fall from that dizzy height would mean sure death for her.

There was the bare possibility, however, that the *gnarsh* would not eat her until it reached its eyrie, which would be situated on some inaccessible mountain crag. As there were no mountains on the island, the monster would probably head for the mainland, and he could follow in his flier.

He accordingly turned, and dashed back to where his airship lay. Leaping into the cabin, he slammed the door. The little craft shot swiftly upward to a height of more than two thousand feet. Already the *gnarsh* was more than a mile away, flapping swiftly westward with its victim dangling limply.

LIKE an avenging arrow, the tiny craft hurtled after the flying monster. As he came up behind it, Lotan drew his scarbo, and opening the cabin door, leaned out.

Almost before the *gnarsh* knew of his presence, the botanist had flung an arm around the girl's slender waist. With two deft slashes of his keen blade, he cut

the tendons that controlled the mighty talons. They relaxed, and with a choking cry of relief, he dragged her into the cabin. Turning his craft, he aimed his tork and sent a stream of deadly projectiles into the flying monster. Its membraneous wings crumpled, and it fell into the sea.

Unconscious of what he was doing, the plant-hunter kept his arm around the girl's waist—held her close. He slammed the door, and turning, looked into her eyes. In them he read gratitude—and something more that thrilled him inuneasureably. With that brief look went the heart of Lotan. He was drawing her nearer, crushing her to him, unresisting, while the ship hurtled forward, when he remembered that she was of the nobility, and he only a botanist. The jewels that glittered on her garments would have ransomed a *rogo**. And he was a poor man. He released her.

"You are of Tyrhana?" he asked.

"I am Mirim, daughter of Zand, Romojak† of the Fleets of Tyrhana," she replied. "And you, my brave rescuer?"

"Lotan, plant hunter for His Imperial Majesty, Zinlo of Olba," he replied. "My navigating instruments are out of commission, but when we strike the shore line, which we are sure to do by proceeding westward, I can find the way to Tyrhana and take you home."

"HOME," she said, and there was a sob in her voice. "I have no home, now. My mother died when I was born. My father went down with his ship in the great storm that cast me on that terrible island. Now I return to the loneliness of a great castle filled with slaves." Burying her face in her hands, she burst into tears.

His arm encircled her grief-shaken body, and his hand stroked her soft, golden hair.

"Mirim, I—" he began, then stopped resolutely. The gulf between them was too great. Now if he had but found the *kadkor* and won the reward, he would be her equal—could ask her hand in marriage. He gasped, as that which had been in the back of his mind, endeavoring to fight its way into his objective consciousness, suddenly occurred to him. He *had* seen the *kadkor*. It had been a *kadkor* that Mirim had climbed to escape from the *hahoes*. But in the excitement of the moment his mind had only registered the fact subjectively. Back there on that tiny islet, now several hundred *kants* away, was the object of his quest. But he did not know its bearings, and had not even a compass to guide him. He might search a lifetime and not find that islet again.

Presently the girl ceased her sobbing, sat up and began to adjust her disheveled garments. She detached her belt pouch and handed it to him.

"Will you empty this for me, please?" she asked. "It came open and got filled with some horrid gray spores."

Lotan looked at the spores, and his heart gave a great leap of joy, for they were the spores of the *kadkor*, scraped from the gills of the fungus by her open belt pouch as the girl had been dragged aloft.

"I'll keep these, if you don't mind," he said, "for to me they are worth the purple, and a thousand kantols of land. Moreover, they give me the courage to say that which has lain in my heart since first I looked into your eyes. I love you, Mirim. Will you be my wife?"

"Take me, Lotan," was all she said, but her lips against his told him all.

* King. † Admiral.

THE END.

Blue Beam of Pestilence

By EANDO BINDER

The blue beam focused on Pluto—and a planet died!

CHAPTER I

WAR DECLARED!

IT was in the Sikka 444* that the inhabitants of the various worlds of the solar system suddenly became aware of the Blue Beam from outer space which threatened to depopulate that thriving community of worlds. Like a sword from Heaven an arrowing beam of visible blue light shot from the void and lighted upon Pluto, the outermost of the planets. The Plutonians, small, sensitive-eyed rational creatures that looked like Earthly spiders, were greatly annoyed by that bright light which shone in their delicate eyes unremittingly, every hour of the day. They sent in a complaint to the Solar Council on Earth to ask that the matter be investigated, as it was seriously disturbing their industry and ability.

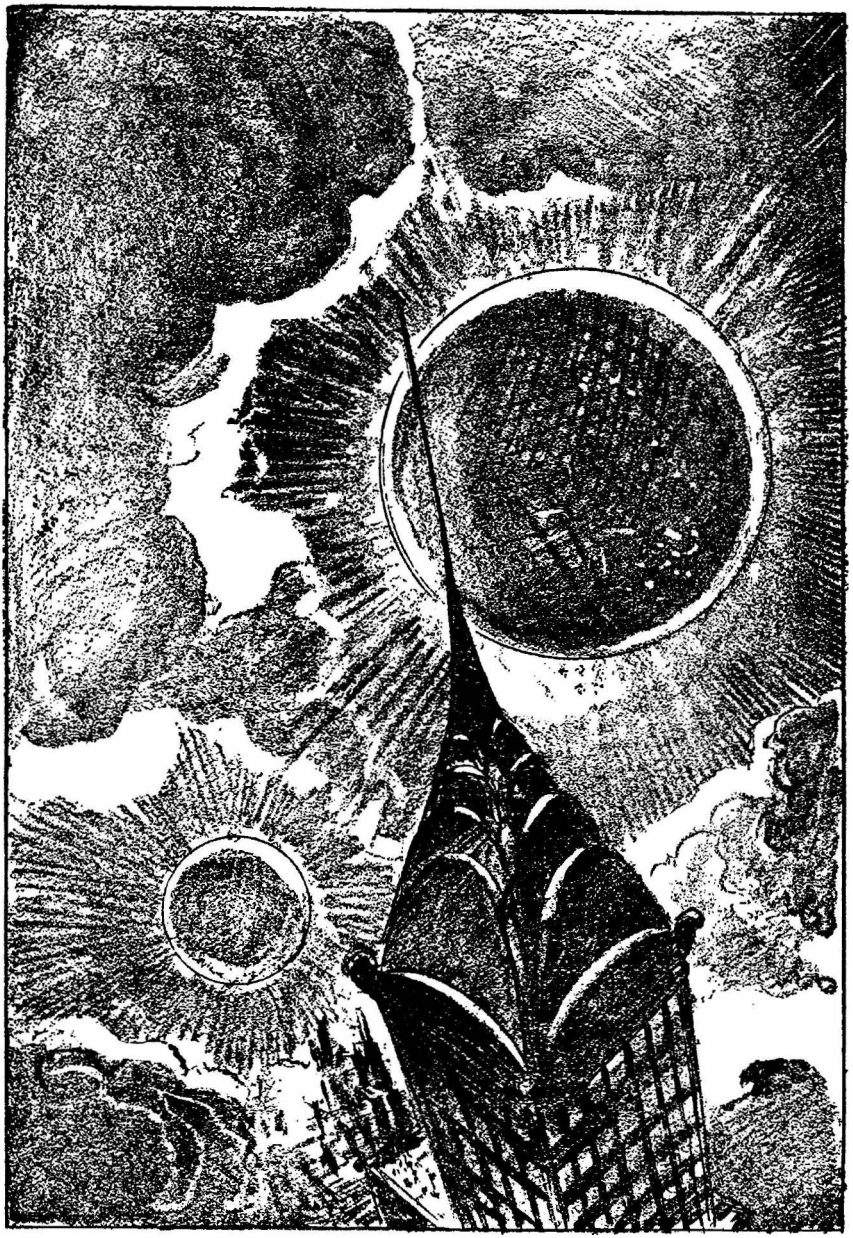
Two Earth-days later the alarming news came in from distant Pluto that the Blue Beam was not merely bothersome but insidiously dangerous, for already the inhabitants were beginning to die off, gripped in the throes of a mysterious malady that came with the Blue Beam. Then the Solar Council, which had been ponderously deliberating its first move, sprang into action under the impetus of that new fatal development.

From Earth and from all the other worlds, the mystifying light from the void could be seen as a solid-looking blue shaft, extending from Pluto (which was itself invisible to the eye of anyone on the minor planets) out into space till it was lost for distance in the region of alpha-Centauri. That it was not ordinary light was quickly apparent, for then it would have been invisible to any except the Plutonians. It must be some new and astounding type of radiation that could so affect the ether as to make it a reflecting medium as well as a carrier.

As soon as the Blue Beam came and the different worlds saw it in their night skies, a general feeling of unrest overwhelmed the solar system. Its very sight struck a nameless terror in the minds of everyone from Pluto to little Mercury. Its uncanny visibility, its persistent duration, and its mysterious origin sounded a note of dire calamity throughout the Solarian Empire. And it stuck to Pluto like glue, bathing it in a ghastly blue glow.

The Solar Council's first move was to send a delegation of renowned sci-

*NOTE—the Sikka, time standard of the solar system, was eleven years and three months of earth time. The new time system replaced all local systems of the different worlds in 2556 A.D. Therefore the first eleven years and three months of time after 2556 A.D. became the Sikka One of the solar system. However, each of the worlds still retained and often used their own time-hallowed systems of computing the passage of time. The Sikka was based on the sun-spot cycle of the central luminary.



entists to Pluto to investigate the terrifying phenomenon. These men, astronomers and physicists, traced the beam back into space and found it coming from a star in the regions near alpha-Centauri, but much farther away. This brought a sigh of relief to the citizens of the Solarian Empire, for it absolved the Centaurians from the blame; which was well, in view of the fact that these people had attacked the solar system only a hundred Sikka before. They had been repulsed and the two empires had made a peace treaty. Everyone felt glad that after all the Centaurians had not broken their promise.

The star from which the beam originated, the delegation found, was 188 light years away (Earth measurements). It was a small sun as suns go, being but twice the volume of Sol. It was known to astronomers as CX-88.

In two more Earth days the public news-broadcasts blared forth a paralyzing tale of woe that centered on luckless Pluto. Half the Plutonians had died miserably and wantonly from the Blue Beam. A storm of rage swept over the Solarian Empire. Each of the worlds sent in a pointed message to the Solar Council that that body must act, and act soon and decisively. Accordingly, the Council, somewhat slothful after many Sikkas of quiet and peaceful times, shook itself free from lethargy, and drafted a group of the most eminent scientists from every world. These savants were sent to join the initial body of investigators. Their purpose was to save the rest of the Plutonians and to solve the mystery of the Blue Beam.

They fell to with a will and found out certain things about the Blue Beam, but they were powerless to save the Plutonians. The inhabitants of Pluto died, billions upon billions of them. Only those who had been on other planets at the time, or had left their homes the first day the beam appeared, lived to carry on the race. Strangely, none of the other peoples, whether Martians, Tellurians, Venerians, or any others, were affected by the Blue Beam. They who were left on Pluto, what few there were on the planet at the time, were to bury the masses of dead.

Then, as if the senders of the ray knew exactly what had happened, the beam flicked lightly away from grieving Pluto and darted accurately on Neptune, like a striking snake. At first the Neptunians were panic stricken. Then they were reminded that the Blue Beam could affect only Plutonians and thereupon they breathed in relief. But a short-lived respite that was!

IN two more Earth days the Neptunians began to die off with the same symptoms that had marked the perishing Plutonians. Then it was that the Blue Beam was seen to be a little darker, to have a little more color to it. It now was fatal only to Neptunians, leaving untouched all other races, even the few surviving Plutonians that had migrated to Neptune to escape the beam, when it had bathed their world in its baleful glow.

All through the Solarian Empire echoed the terrifying naked truth about the Blue Beam. Its purpose was no longer a mystery. Some alien intelligence on CX-88 was systematically wiping out all life in the solar system, starting from the outermost planet, Pluto, and working inward. It staggered the mind to understand how a beam of energy of some sort,

traversing 188 light years of space, could unfalteringly light on a tiny mote in fathomless space and destroy its rational life in some six or eight Earth days.

Rapidly the dormant fighting instincts of the peaceful Solarian Empire were aroused. Then it was war of a sort! A remote control invasion sure to be followed by actual invasion once the Empire had been almost completely depopulated!

The war-cry rang through the ether, spreading from planet to planet like a fire-brand, until a great and united system of planets shouted in one stentorian voice: "Retaliation! Vengeance! Death to CX-88!"

The Solar Council heeded the call and met on Earth eighteen days after the appearance of the devastating Blue Beam, for a war program.

Siglo Albermarle, Supreme Head of the Solar Council, an Earthman, called the meeting to order. He swung his keen blue eyes about the array of television screens, in each of which was framed the face of one of the Solar Council members. Beside him sat Toom V-3-X-44 of Jupiter and Uaaii-23 of Venus, who had chosen to attend the War Council in person.

The progress of the War Council would be carried to every nook and corner of the Solarian System by super-radio and television* so that every citizen of each world would know exactly what was to be done in this crucial matter.

"Fellow Councilors and citizens of the great Solarian Empire of Sikka One to 444!" began Albermarle. "We are threatened with utter and absolute extinction by the Blue Beam from CX-88. Thrice before have we been attacked from outer space and thrice have we been victorious. But those other attackers came in space vehicles, so that we had something tangible to battle. Here we have but a Blue Beam! That will call for new methods, new ways to protect our glorious Empire. We will hear first the report of the scientists who have been to stricken Pluto and Neptune."

The spokesman of the scientists, a pudgy, kangeroo-like creature of Mars, reported as follows:

"The Blue Beam, to leave out all technical terms, is a new type of ether vibration travelling, according to our measurements, instantaneously. We have attempted to shield it off, but it penetrates all materials of any reasonable thickness. Only diamond will stop it, but that does not help us a bit, as no planet could be entirely shielded with that material, which is rare in nature and not very easy to manufacture in large quantities.

"The effect of the Blue Beam is to coagulate the colloids of the brain so that the victim first loses sanity and then is brought by paralysis to complete incapacity. Death follows rapidly. As the colloids of the brain-structures of each planetary people are markedly different chemically, the Blue Beam can affect only one race at a time.

"In behalf of my collaborators, I state here and now that we can do nothing more than we have done already to circumvent the diabolical Blue Beam. We have busied ourselves in the last week of Earth-time in promoting the migrations of the Uranians to other planets in an attempt to save them from annihilation, for they will be the next in the path of the Blue Beam. That is all."

*NOTE—Super-radio and television operated by speeded up etheric vibrations which travelled at a million times the speed of light, thus eliminating the time drag that would accompany radio communication between planets with ordinary vibrations of the speed of light.

There was a hushed stillness. The report of the scientists had suddenly revealed the complete helplessness of the Solarian Empire. Science had as good as admitted defeat. What could the People do?

"You have heard the report of the scientists," said Albermarle slowly. "It is obvious then that we are doomed to virtual extinction if that Blue Beam continues to stab from the dark void as it has for eighteen Earth days already. Pluto and Neptune are practically lifeless worlds. Uranus will next succumb.

"But we will forestall the Blue Beam. Already half the Uranians have moved to other worlds and been replaced by other races. When the beam strikes Saturn in the near future, we hope to have all the Saturnians safely away from their native world. We will continue to do this shuffling of people, despite the hardships and inconveniences entailed, till further plans can be made."

BUT even as Albermarle finished a new voice burst into the air. It was the Planet Radio Station of Mercury.

"Councilors of the Solarian Empire and Peoples of the Nine Planets! But a short time ago the Blue Beam swung away from Neptune, but instead of lighting on Uranus as we all thought, it has engulfed our world, Mercury! Already my people are screaming in fear and insanity. We are unprepared, thinking we would be the last to be attacked by the Blue Beam. My people will die almost en masse!"

A series of television images looked at each other in horror. Audible gasps arose from several throats. The Mercurian Councilor fainted dead away, and his screen became blank.

"Master Albermarle!" rang out a deep, resonant voice. Eyes one and all turned to Toom V-3-X-44, Councilor from Jupiter. Twelve feet high he towered, a thin, stalk-like creature with three legs arranged like a tripod, and four long blade-like arms.

"Master Albermarle and Fellow Councilors!" he boomed like a cannon. "It is useless for us to attempt to circumvent the Blue Beam by shiftings of populations. That the instigators of the beam know our every move is evidenced by this last news we heard—that Mercury and *not* Uranus, became the next victim. Even if we shuffle our populations a thousand times, and mix them up on every planet, the senders of the Blue Beam will flash their lethal ray on each planet in turn, attuning it to the different races alternately, thus accomplishing their original aim."

The Councilors looked from one to the other in despair. The words of Toom were only too true!

The Jovian's reverberating voice went on:

"No, fellow citizens of the great Solarian Empire. We cannot hope to survive by fleeing from one planet to another and hiding behind one another's bodies. There is only *one way* to save the Empire. *We must send our warships to CX-88 and fight the menace in his lair!*"

There was a moment of awed silence. Then a unanimous shout arose from the Councilors. "Toom is right! We must go to the lair of the Blue Beam!"

Toom wrapped his arms around the post which stood before his television cell, in the typical Jovian way of "sitting down," and nodded to Albermarle to resume the command.

"Then it is decided," said the Earth Councilor, "that we will at-

tack CX-88. With the armament developed in the last invasion, the War of the Binary Sun, we are well prepared to launch such an attack. One major problem arises immediately, however. CX-88 is 188 light years Earth-time away. With our present space warships, it will take so long to get there that perhaps the Blue Beam will finish its deadly work before we can demolish the projector!"

There was a deep, painful silence following these words.

Then Uaaii-23, Councilor of Venus, stirred from his immovable position and spoke. He was a semi-crystalline creature built up in series of protoplasmic sinews and silicic hexahedrons, but three feet long in greater length — a transition product between the crystalline silicon people of Mercury and the amorphous carbon people of Earth. Having no vocal chords, he spoke by means of an intricate mechanical contrivance operated by his thoughts.

"Master Albermarle and Fellow Councilors. I wish to report that the scientists of Venus have perfected a new type of space-engine which can develop a top speed of ten thousand times the speed of light! It has not yet been presented to the Interworld Traffic Council because the inventors wished to experiment with it first. However, in this time of need, the new engine will be immediately placed at the disposal of this Council."

A murmur of approval echoed from the television screens as the metallic voice of the Venerian ceased.

"Good," said Albermarle. "With this new engine we will yet be able to save the peoples of the Solarian Empire. However, we must put through our plans and launch our war-fleet as quickly as possible, for every extra delay means many more millions of lives lost.

"Whom will we invest with the commandership of the expedition?"

A piping, whistling voice came from one of the screens.

"Fellow Councilors, whom better can we find to lead us in war than the one who leads us in peace? I mean none other than Siglo Albermarle!"

"Siglo Albermarle!" rose the unanimous shout from the Councilors.

"And for second and third commands," went on the piping voice, "the sagacious Toom of Jupiter and the magnanimous Uaaii of Venus!"

Another unanimous shout signified assent. Invested with supreme command, Albermarle quickly outlined a program, helped at times by Toom and Uaaii. The Solar Council adjourned after a full Earth day of discussion with a complete war-program worked out.

CHAPTER II

The Enemy Appears

EIGHT Earth days after the meeting of the Solar Council to initiate a war-program against CX-88, the warships of the Solarian Empire were ready to leave. In that time the pestilential Blue Beam had destroyed the Mercurians in vast numbers, leaving only the pitiful few of the crystalline silicon people, who had managed to escape from their planet. The Venerians, fearful of being the next victims, left their planet in legions, swarming all over the Solar System. Surplus populations, guided by the hastily authorized Migration Commission, were transferred to stricken Pluto and Neptune.

"Citizens of the great Solarian Empire!" said Commander Albermarle in his farewell address. "Your burden is mighty, but in seven Earth days our ships will be within striking distance of the enemy. Be of good cheer and remember that the powers of the Empire will blast upon the senders of the Blue Beam, if your tribulations seem more than you can bear. We go, people of Sol—to avenge our murdered brethren!"

A mighty cheer rose from the trillions of throats, a cheer that Albermarle could not hear as he stepped into the near-by warship. But he knew without asking that on him and his followers depended the future continuance and welfare of the Empire.

Two gleaming, sparkling warships arose from Earth and shot into the void. They composed the "fleet" of the Solarian Empire. Side by side, like two inseparable parts of one object, the gigantic spheres leaped away from the solar system. Their hulls were pure diamond as protection against the Blue Beam should it be directed against them. Evenly distributed over the surface of the sparkling hulls were alternate rows of short metal tubes, small copper globes, and steel-blue funnelled apertures. A highly-advanced, cooperative group of scientists had put forth every bit of knowledge at their command in the making of the two ships. They were storehouses of almost invincible power.

As the Venus engines, utilizing atomic energy, drove the warships into the void, Commander Albermarle contacted the sister ship, whose command had been entrusted to Toom and Uaaii jointly.

"I have here first hand information of the planetary system of CX-88, as compiled by the astronomers of Titan, sixth moon of Saturn. The star CX-88 has three separate groups of planets, each in a different plane in space. The planets total fifty-six. On one of them must be the projector of the Blue Beam. It shall be our task to determine which of the satellites of CX-88 carries that projector."

Toom's flower-like face swayed slightly in the television screen. "In other words, Commander Albermarle, no easy job."

"I am afraid not," agreed Albermarle. "However, we can do nothing as yet. We must await further developments."

"We can await them in full confidence though," came the mechanical voice of Uaaii from beside Toom. "For whatever betide, these two ships of ours will carry us through victors. There are only two types of energy that can affect us at all. It is doubtful if the enemy has either of them."

"I am not sure of that point," said Albermarle, shaking his head. "A race of intelligent creatures that can project a colloid coagulating beam 188 light-years in our Earth measurement through space might conceivably have one or both of those energies available."

The two ships careened by Alpha-Centauri four hours after their departure from Earth. A message of cheer shot to them from that sun. The Alpha-Centaurians expressed regret that under the circumstances they could not offer any material help to their allies, but that should the enemy come out victor and continue their diabolical Blue Beam exploits in the Solarian Empire, they, the Alpha-Centaurians, would take steps to save the Empire from absolute extinction.

Albermarle sent back a message of thanks, but there was a curl of scorn on his lips. He knew that the Alpha-

Centaurians would lift no finger to help the Solarian Empire, unless in the act they themselves would be benefited.

The trip through space settled down to monotonous routine. While Commander Albermarle slept, his second in command, one of the queer squat, creaking Mercurians, Xixxus by name, attended to the light duties of head man. Composed of interlocking silicic ligaments of crystalline texture, he was a slow-moving, tireless creature who required no sleep. His ten mirror-like eyes burned with a fierce fighting lust against the people of CX-88, for the memory of his fellows dying in the throes of insanity and paralysis had burned deep into his rock-like brain.

It was on the second Earth day out that the first test of strength with the enemy occurred. Commander Albermarle had been gazing moodily out at the vista of blazing stars set in a pool of soft purple-black, when his chest-phone buzzed and burst into words.

"Commander Albermarle. P i l o t room speaking. The Blue Beam has left Mercury but instead of lighting upon some other planet, it is now centered upon our two ships out here in space!"

Almost immediately Toom's face appeared in the television screen. There was the suggestion of a smile on his slit-like lips.

"The enemy thinks to bring insanity and death upon us, not knowing we are well protected behind diamond hulls."

"I only hope," answered Albermarle, "that they keep the Blue Beam centering on us whom it cannot harm, rather than on the worlds of the Empire."

HOWEVER, after six long Earth hours of this strategy on the part of the enemy, during which time the ray changed from dark blue to purple blue and finally to sky blue, the Blue Beam left the warships and swung majestically, threateningly, back to the Solar System.

The message came from the Empire allmost immediately that Jupiter was now being bathed in its eery, fatal glow.

Toom's face appeared suddenly in the screen, contorted in a vast rage.

"Oh, that we could close the distance between us in a trice," he boomed vehemently. "That we might sooner come to grips with that hellish race of CX-88! MY people—now they are to feel the poisoned effect of the insidious Blue Beam!"

"It will not be so bad with your people," said Albermarle consolingly. "A large number of them were moved to other planets by the Migration Commission in preparation for such an occurrence."

Uaaii's metallic voice tolled bell-like as Toom bowed his leafy head in resignation and stepped aside.

"We have come to grips with the enemy. Let us hope that we shall emerge as unscathed in future tussles as in this first affair."

Space was a queer sight to the warriors who dashed through the ether at the furious rate of ten thousand times the speed of light. In back nothing could be seen, for the light rays were left far behind. It was the vast chilling emptiness of a bottomless pit. To the side and up ahead the stars shone with colorful intensity, subtly altered from their appearance when seen from a planet. There were also blinding flashes straight ahead as the probing disintegrator beams puffed into atoms the wandering stones of the void to prevent them from colliding with the ships. At times a star grew to a disc and then a ball, sending

its bright rays to the twin spheres, lighting them up like two scintillating jewels.

Inside the ships there was a deathly silence, for the engines were silent in operation. Queer figures stalked about, each astoundingly different from the other in outward form, yet all burning with the same purpose. Citizens they all were of the great Solarian Empire and they had but one aim. One hundred creatures there were in each ship; two hundred souls altogether from some twenty-two different worlds* of the Empire. Many of them, whose life spans measured all of 500 Earthly years, were veterans of the War of the Binary Suns, when the people of Sol had successfully resisted invasion from outer space. Once again they were fighting for their glorious Empire; they spent much time peering ahead, waiting for the enemy to appear.

Four Earth days out, which was half way to CX-88, Albermarle gave the order to build up the protective screens. As the skillful operators manipulated the controls, the mists of bound electronic forces swirled around the two ships. A low hum came into being inside the craft, a song of power. Then the protective screens took form as vague shimmering shadows and locked about the ships like the mothering wings of some gigantic benign being.

It was well that this was done for at the end of the fourth day a soft yellow ray shot viciously from CX-88 toward the avengers. It splashed liquidlike on the electronic screen, sent probing fingers of yellow all around for an opening, then flickered out, destroyed by the screen forces. Again and again the enemy sent that yellow ray at the two speeding globes and each time it came it splashed more and more thickly on the screen.

Toom's figure appeared in Albermarle's television screen. There was unmistakable sardonic glee on his face.

"The enemy is beginning to tremble, I think. We have warded off two of their most powerful forces already."

"If they tremble now," came Xixxus' voice, mechanically produced like a Venerian's, "they will shake violently later when they come within range of our own armament."

"Could that be but now!" exclaimed Toom fiercely, bitterly. "The Blue Beam has played upon my world now for two Earth days. Already reports have come in from the Empire that my people are dying by the millions!"

Not many hours after, the yellow ray vanished to be replaced by a pale green beam, that hurtled against the screens and sent up a shower of blinding sparks. For many Earth hours this green ray battered the screens, dissolving into fountains of impotent electrical discharges. Albermarle smiled to himself. The enemy would gradually learn that Solarian science was no mean development, being a composite product of many different kinds of intelligent races. They would learn, as Toom put it, that well-nigh invincible forces, in almost indestructible ships, were descending upon them in a mighty wrath at their cosmic misdemeanors.

The green ray was withdrawn after some time and there was peace for a while.

Then Commander Albermarle called for target practice. Each of the ships tossed out small metal balls and the gunners of the other ship whiffed them into nothingness or otherwise

*Note—Many of the moons of the planets carried distinct races of rational beings, especially those of Saturn and Jupiter.

sent them away from the "field of action."

FROM the funnel-shaped apertures shot powerful repulsion rays which knocked the targets away as a child bats away a stone with a stick. From the copper globes shot streaks of super-high-voltage lightning, fusing the targets, so that they dripped molten in the absolute zero of space. Dim, vaguely-defined disintegrator rays spouted from the metal tubes of the ships' hulls to touch the target balls into scattering atoms and molecules.

The targets were released in a variety of ways, undulating, circling, speeding like bullets, or merely floating, and seldom did the trained gunners let one of them tarry long unmolested. Toom himself took over one of the lightning guns, and Uaaii, who stood beside him, could see the prophetic sparkle in his saucer eyes as he expertly flicked target after target. He was imagining that each of them was a ship of the enemy. Uaaii sympathised with him, for every minute the reports came in from the Empire that Toom's people, the Jovians, were being decimated in legions.

But now there occurred something that immediately stopped the target practice. A shock ran through both ships and the velocity indicators showed a decided drop in speed. Albermarle, suspecting it to be caused by the enemy, set the scientists to determine what it was that had so slowed them. They reported soon after that an invisible force, powerfully repulsive, was resisting their flight forward. Right after this the pilot reported that despite his efforts, the ship was being turned aside from its course, slowly and inexorably. A moment later Toom's voice burst in and reported the same thing occurring to his ship. The enemy, with a repulsive force, was shoving them aside and at the same time reducing their velocity.

"We must do something, Commander Albermarle," said Toom. "At this rate we will never see CX-88!"

"We cannot get any more out of the engines," returned Albermarle thoughtfully. "They are already working at their top limit. Let us try changing direction so that the beam will lose us."

Accordingly, with the two pilots of the twin ships working as one, the war craft suddenly swung sideward. After a time Albermarle gave the order to straighten out again. With a surge of power the ships leaped ahead at full velocity in the right direction.

"Slipped out of their hands!" boomed the Jovian.

But Albermarle was less optimistic. He stood waiting expectantly. Then it came again—a pounding shock and the velocity needle dipped.

"Can't escape them that way," said Albermarle. "They have an eye on us."

His chest-phone buzzed and the head scientist, a Martian, spoke:

"I have a suggestion, Commander Albermarle. If we can split the beam and make it flow beside us, the drag will be eliminated."

"Good. Have your staff work on that."

In their completely equipped laboratory, the scientists analyzed the beam, plotted its make-up, and rapidly constructed a cone of force to split it. This cone was built up and enlarged until it engulfed both the ships. Immediately the craft darted ahead and the velocity needles climbed to top speed.

With the uncanny ability the enemy seemed to have of knowing everything that occurred, the repulsive

beam was withdrawn as the splitting cone nullified its effect.

The enemy made no further move during the sixth and seventh Earth days of the voyage. At the beginning of the seventh, CX-88 emerged from the Heavens as a slowly growing disc. Excitement reigned aboard as the lair of the senders of the abominable Blue Beam loomed closer and closer. One and all they eagerly awaited the grand moment when they could descend upon the cowardly enemy like a bolt from God.

As the two ships drew nearer to the sun, the protective screens which had shimmered ghost-like in the starlight of space, faded into invisibility in the strong sunlight, so that the craft sparkled bare and distinct. Pitifully insignificant they seemed as the giant planetary system of CX-88 became recognizable.

It was when the planets had grown to pea-size that the enemy ships appeared. In a vast horde, like bees swarming to a new hive, the bullet craft hurtled up from their sun, their black hulls shining like armor in the sunlight.

Commander Albermarle called a halt when the enemy was sighted.

Toom's excited features appeared in the television screen.

"Look at them. They come in countless numbers, cowards that they are. But they will see what two lone ships can do to them."

The enemy horde came to a stop some distance away as if mocking the two ships that dared to face their numberless might. They had no formation but crowded densely in a black mass. Then they leaped forward.

Now Commander Albermarle barked sharply into his mouthpiece:

"Attention! Battle Formation! At the enemy!"

CHAPTER III

The Red Beams

THE two diamond hulled ships of the Solarian Empire swung in a line parallel to the swiftly approaching enemy and separated till there were five miles of space between them. Then, at Albermarle's signal, a livid stream of translucence flowed from each ship to meet in the middle of the space between them. The two ends of the discharges fused into one another to make an intangible rope linking one ship to another. Then the billowing material began to pulsate and glow brightly like a writhing snake.

It was a source of vast energy. From the very ether of space this undulating rod of energy extracted titanic forces to be used in battle. It flowed into the ships and pooled into giant accumulators, ready to be loosed in any of a number of ways.

From the nearing enemy fleet darted a kaleidoscope of visible rays. They hurtled to the motionless globes, with the quivering line of white incandescence between them, and licked eagerly around the electronic screens, seeking an entrance. Yellow rays splashed like soft mud and crept octopus-like around the screen. Green rays showered in glowing sparks that never touched the diamond hulls. Violet rays struck like a gimlet only to flick out suddenly. Large, blunt metallic objects streamed crazily up to burst into electric dust on the screen. Smaller objects that looked like cubes of sugar sprang up and pounded at the screens, dissolving into white puffs of vapor.

But the electronic screens remained adamant, completely shielding off the hulls from contact with any of the rays or bombs.

Then the Solarians struck. The powerful energies of the ether were loosed from the accumulators. From the copper globes sparkled a steady stream of lightning bolts which fused the black ships like so much butter. From the funnel-apertures sprang repulsion rays, which dashed black ships backward so forcefully as to cause them to ram and smash dozens of others. From the ray tubes issued invisible disintegrator beams, which flicked the black ships into puffs of vapor that diffused instantaneously in space.

In less time than it takes to tell it, there were gaping holes in the mass of black ships where they had been fused, disintegrated, or smashed to jagged bits. But they came on undaunted and completely surrounded the two Solarian ships, sending their rays and bombs at them in furious abandon. So unorganized were they and so demoralized by the steady bite of the diamond ships' armament, that the black ships often destroyed each other in their wild attack. The carnage was still further increased by black ships that inadvertently touched the rod of pulsating energy connecting the Solarian ships, for they would violently burst into fragments, piercing near-by craft with meteoric lumps moving at frightful velocity. Many of these pieces of exploded ships pelted on the diamond hulls of the Solarian ships, affecting them not in the least.

The repulsion-ray gunners, connected by radio, quickly worked out and put into effect a particularly devastating strategem. At a signal all the gunners on the same side of the ships as the rod of etheric energy, would direct their rays straight into the mass of black ships between them. Pushed by the repulsion rays from both sides, the unlucky enemy craft would be crushed together like a mass of egg-shells. Then a concerted oblique push would send this interlocking mass swirling like a tiny planet into the mêlée of black ships above and below, to smash further dozens to bits.

"They can't last much longer," said Albermarle, speaking to the other ship.

"Surely not. Half their number is gone already," came the metallic voice of Uaaii.

"Where is Toom?"

"He is seated at one of the repulsion guns, Commander Albermarle. He could not stand by merely issuing commands, so he left me in charge and took over a gun."

Albermarle smiled momentarily, then barked several orders, having seen a group of black ships dashing full tilt at his ship in an attempt to ram it. The watchful disintegrator gunners puffed them to tenuous vapor.

QUITE suddenly space became clear; the pyrotechnics of colored rays faded, and the remnant of the enemy fleet fled precipitately.

"Shall we give chase?" asked Uaaii. "We could follow them to their base and destroy it."

"No," commanded Albermarle. "We have a more important task to do for the present."

Toom's face appeared in the television screen. His large eyes sparkled with grim joy.

"I feel much better now, Commander Albermarle. I can safely estimate I destroyed a hundred ships myself! And yet that is but a tithe of the numbers I would wish to send to oblivion!"

"Yes, but we have a bigger score than that to settle, Toom. They have killed citizens of the Solarian Empire numbering many billions. We will pay

back that heavy debt soon, but first we must find the source of the Blue Beam and destroy the projector once and for all. Every added second it continues to radiate its beam adds thousands to the death list back home."

Albermarle connected with the pilots.

"Send the ships down to the Blue Beam."

A moment later a piping voice answered: "The Blue Beam, Commander Albermarle, is invisible. It is nowhere to be seen!"

Toom and Albermarle looked at each other puzzled.

"Could they have stopped it for the very reason we are here?"

"Then back!" cried Albermarle. "Back some two Earth hours in space where I last remember seeing it. That is the only way we will know whether it is off or not."

"There it is!" cried Toom two hours later during which time they had partially retraced their trip in the void. "Just below us."

"Lower ships and follow the Blue Beam!" ordered Albermarle.

Obediently, the two globular craft sank to a position just above the ghostly Blue Beam and trailed it toward CX-88.

"It's gone!" said Uaaii puzzled suddenly.

Albermarle ordered the ships backward and then forward paralleling the ray. At a certain point it became invisible and could not be seen up ahead in the direction of CX-88, although it stabbed as viciously as ever to the back.

"What cunning people," commented Xixxus. "They have made the Blue Beam invisible as it comes from their projector so that it will be untraceable!"

Albermarle spent a moment in thought. Then he called the scientists.

"See if you can trace the Blue Beam by instruments."

The report of the scientists came back an hour later as the two ships yet hovered over the breaking point of the colored and invisible parts of the Blue Beam.

"There is no instrument that will follow the Blue Beam, Commander Albermarle. It seems to be charged with some static force that scatters all effort to measure its direction of flow. We have tried sighting also in a line parallel to the beam, but, oddly enough, this line runs through space in between the planets of CX-88, never once nearing one of them!"

Toom shook his head angrily.

"And every moment we delay, my people die!"

Commander Albermarle sucked in his breath slowly and whistled it out, puckering his brow in thought. Then he contacted the radio room.

"Call the astronomical station on Titan moon of Saturn and ask if they can trace the beam to a certain planet of CX-88."

"In the meantime," he continued, speaking to Toom, "we will scout around CX-88 and perhaps we may find out something."

But while the two ships were yet streaming toward their destination, a report came from the radio room.

"The Titan Astronomers will attempt that difficult task, Commander Albermarle, and will report in a few Earth hours. But I have here another report. The Blue Beam has left Jupiter and is now centered on EARTH!"

Only in one way did Commander Albermarle show how that tore his heart. His teeth clicked suddenly shut like a vise.

"We will not delay any longer," he

said grimly. "Full speed ahead! We will raze every planet to the ground till they cry for mercy!"

"Good!" echoed Toom enthusiastically.

Like gigantic thunderbolts, the two spheres leaped toward CX-88. Inside were ten score determined, grimly eager warriors. The last report from the Empire had crystallized their resolve into mighty anger, for Earth had long been recognized as the keynote, the very heart of the Solarian Empire. They must strike and strike quickly lest the Empire become a shambles of crazed, ungoverned peoples; lest the cooperation of the planets of Sol become shattered by the scourge of the Blue Beam.

UNERRINGLY, the globular vehicles sped to the outermost of the planets and hovered above it like a vulture. Then the pulsating rod of energy came into being between them and they began to circle the planet. Utilizing the mighty power of the ether energies, the craft extended invisible tentacles of attraction to the planet. Once this force firmly anchored them some fifty miles above ground, they increased their revolution more and more till they spanned the planet's circumference in a short five minutes. Centrifugal force was offset by the firm anchorage of the tentacular gravitation fields.

"Now!" shouted Albermarle.

As one, all the disintegrators that could point downward poured forth their rays, fed by the rod of etheric energy. Where the broad concentrated rays touched the ground, a trail of white puffs arose. Cities, people, anything on the surface of the planet were whiffed into flying motes.

The maneuver had been planned to the last item. The two interlocked ships, circling like super-fast satellites, changed their plane of operation every revolution so that new area was constantly bared to the titanic, blended disintegrator ray. To the inhabitants of the planet it must have seemed a visitation from a god, for to them the two diamond-hulled ships would be invisible because of their rapid motion across the sky.

The Solarian Empire had begun its retaliation. It was making its first payment of the heavy debt it owed to the people of CX-88.

Three Earth hours later Commander Albermarle called a halt and looked downward through a telescope, as they drifted lazily over the planet.

Toom's deep voice burst into the air.

"That will teach them a lesson. But there are many more planets. Let us get to the next one."

"That is all we can do, Toom—kill them off as fast as we can to make up for the wholesale murdering of the Blue Beam. They will yet come to their knees before us."

As they sped vengefully to the next planet, a call came from the Titan Astronomers.

"We are unable to trace the Blue Beam definitely to any one planet of CX-88. Our instruments are not delicate enough to reach across the 188 light-years of space accurately."

Commander Albermarle sighed in resignation.

"Then we will continue destroying the enemy civilization. Sooner or later they must come to terms."

"Only then it may be too late," added Xixxus softly, bitterly, thinking of his decimated people.

Four more planets were striped with the devastation of the disintegrator rays in the same way as the first. The gunners almost fought over the privilege of handling the projectors,

they were wild as news began to come in from the Empire that Tellurians were already feeling the effects of the Blue Beam, and that the Empire was tottering from its high seat of unity. A message that tore the heart-strings of the warriors came from the Solar Council:

"The Blue Beam, pressing its poisoned finger on Earth, the brain of the Empire, is rapidly bringing about complete collapse. Already half-crazed citizens are storming the sub-posts of the Council and asking that something be done, although, as a Higher Spirit knows, there is nothing we can do further than we have done. Ships are leaving the Solar System, bound for other stars, bearing hundreds, sometimes thousands of fear-crazed people. The Empire can yet be saved, Commander Albermarle, but the Blue Beam must be stopped before many more Earth days pass or it is the end!"

Commander Albermarle, suddenly old and weary, sent a message back:

"Courage, members of the Solar Council. We are systematically razing each planet of CX-88 to the ground. They will surrender soon."

Then with terse commands, Albermarle sent the ships to the sixth planet to continue the destruction. But here they met opposition.

A vast fleet of the black ships of the enemy, far larger than the other fleet that had been routed, came to meet them. Unhesitatingly, the Solarian ships plowed through them hurling lightning bolts, disintegrator rays, and repulsion rays in a steady stream. In the face of their wall-like front, the Solarian pilots out-maneuvered them and took up the rapid revolution about the doomed planet, cutting a wide swath of destruction across its face. As soon as they slowed up, the black ships again darted at them.

"We will bring them to their knees!" exclaimed Albermarle. "To the next planet!"

But here something untoward happened. The Solarian ships had worked from the outermost planet to one of its three planetary systems. Accordingly, they were now quite close to the central sun and were almost completely surrounded by other planets further out.

As the two spherical ships began to build up speed around the seventh planet, a soft red beam shot upward from it. Then simultaneously, two other red beams stabbed to them from planets that formed the angles of a triangle with the seventh planet. Immediately their velocity dropped to zero and they became locked into space, held by the three red beams.

Uaaii's metallic voice resounded in Albermarle's ears.

"They have it! That is one of the two forms of energy that can affect our ships! Commander Albermarle, if we stay here we are doomed, for they will lock us tightly into space here and bombard us at their leisure. I think we can break away from three red beams, but if another is aligned on us, we may be completely stalled!"

Albermarle spoke into his chest-phone.

"Pilot room! Break away with full power and head for outer space!"

There came a jerk, and tremors ran through the ship. For a moment there was no motion as the powerful engines strained against the binding force of the three red beams.

Then Toom's voice resounded anxiously.

"There is a fourth red beam just flicked on! They are swinging it about, trying to center it on us! We are lost —here it comes!"

CHAPTER IV

Strategy and Martyrdom

BUT at the same moment that the fourth red beam neared the two straining ships, the tug of war ended. With a last wrench the Solarian ships broke away from the three red beams and dashed to safety away from the sun, CX-88.

"Just in time," boomed the Jovian's voice from the other ship. His hair had been standing up straight in excitement. Now it began to fall to normal.

"Now that we know they have the binding energy of the two rays that these ships are not insulated against," said Uaaii, "perhaps they have also the other force which can break down our screens and leave us open prey to their rays."

"It is a fearful possibility," returned Albermarle. "We shall have to watch our step more carefully from now on. It is dangerous to let our ships be surrounded by several planets. These people are past masters of long range beams of all sorts."

"And now," he continued, "we must debate our next move. We can outbattle and out-maneuver their ships, but they have the added advantage of ground projectors on their planets. If we continue the work of destruction we began, sooner or later they will lock us with their red beams, and hold us there for all eternity if they cannot destroy us."

"I think it advisable to attempt to arbitrate with them," said Uaaii.

"Surely with the utter ferocity they show in battle, and the abominable use of the Blue Beam, we cannot expect them to listen to peace talk," boomed the Jovian from beside Uaaii.

"Nevertheless," said Albermarle. "We shall try."

An hour later the radio room succeeded in contacting the enemy by the use of a thought translator on a powerful wave.

"Who calls?" came the mechanical tones of the thought translator.

"Siglo Albermarle, Commander of the Warships of the Solarian Empire, which you have devastated with your Blue Beam."

"You are suing for peace?"

"We will arbitrate for peace," corrected Albermarle.

"Know this then, Solarians. We are the rulers of six planetary systems which we have subjugated by means of our Blue Beam. We saw your system and coveted it, for it is very like our own, sun, planets and all. You have dared to resist, sending ships to attempt to destroy us. You have been successful in a small way, but know this—that we are arising in our might. We will soon crush you to dust. Take the better course. Surrender your ships and we will let you live, only as slaves however. What is your answer?"

"Our answer is that we will continue to raze your planets till there is not a soul living. Beware, senders of the Blue Beam. You are doomed."

Hardly had Albermarle finished than another voice broke in. It was the head scientist.

"Commander Albermarle! We traced that wave. It came from the nearest planet to the sun of the largest system of twenty-three planets. We notice also that due to its peculiar rotation and revolution, it always presents the same face to our Empire! It is highly probable that the Blue Beam is therefore projected from that planet for the sake of convenience!"

Toom and Uaaii, in the television

screen, looked at Albermarle and Xixxus in dawning hope.

"If that is so, then we can accomplish our aim in one stroke," said Toom.

"But remember," cautioned Uaaii, "that the planet mentioned is nearest the sun so that we would be going into the thick of the enemy. Those red beams are to be reckoned with."

After further discussion, which was clipped short by a poignant message of woe from home, it was decided to stake their lives on the chance of getting to the projector.

Back into space went the two ships to gather momentum for a mad dash to the heart of the planetary system of CX-88. Then at lightning speed they dashed full tilt toward the sun. Planet after planet was passed and red beams flickered all about them, chilling their hearts. If ever four of them simultaneously touched the two ships, it would be the end. Fleets of black ships leaped after them only to be sadly outdistanced. Nearer and nearer loomed the first planet, a gigantic body larger than Jupiter.

THEN Albermarle drew in his breath. Before them, as far as the eye could reach, loomed a myriad legion of black ships, so close to each other as to be touching. No ray came from them, they moved not a bit. They had but one purpose—to act as a wall between the planet and the invaders.

Albermarle knew he could not crash through. They were perhaps ten or twenty deep. His diamond hulls would not stand such a terrific smash. He gave the order to swing to the other side.

But in order to do this, the ships had to slow up considerably. Immediately a dozen searching red beams followed them, lighting their hulls momentarily as they flickered on and off. It was a race between the Solarian ships seeking to break the blockade and the red beams aligning on them.

Suddenly there was a terrific jolt.

Commander Albermarle wasted no time.

"Break away to outer space!"

Valiantly the engines strained, fighting the red beams' locking effect.

Then Toom's horrified voice boomed:

"The screens! They have the destroying force for the screens! They are weakening and breaking fast!"

Commander Albermarle gave an order then that startled the engineers in the engine room.

"Feed some of the etheric energy into the engines!"

"It may burn them out," the response came back anxiously.

"We'll have to take that chance," said Albermarle.

A sudden tremor ran through the two ships. Then they broke away from the red beams just as a few of the yellow rays worked through the weakened screens and fused little dabs of the hull.

Once again out in open space, the two warships came to a halt.

Albermarle presented a grave face to Uaaii and Toom.

"We know now definitely that on that first planet rests the projector, because they protected it so completely."

"Our task becomes infinitely greater now that they have found the two energies that can destroy our ships," said Uaaii. His mechanical voice betrayed no emotion, but his curious semi-crystalline face showed a perturbed state of mind.

A message from the Empire yet further depressed them. It stated that Earth people were dying by the mil-

lions and that the Solar Council had but the sheerest thread of control over the formerly united worlds. They had become belligerent and intractable, each trying to save its own people, even at the expense of others.

But these dissensions of the Empire had no counterpart in the warships. Here Martian and Venerian, Uranian and Mercurian, had but one common goal — one aim — to vanquish the enemy. It tore their hearts to hear of those things from home, but it altered not one whit their cooperation and fellowship.

Commander Albermarle called a Council of War in which all participated. The facts were gone over relative to the enemy and the projector and suggestions were asked for. After much unproductive discussion, Toom raised his great voice:

"There is yet one way to destroy the projector on planet one. If once a gap in the enemy ships that wall off the planet from us can be made, our ships could get through. Commander Albermarle, there is one way to do that. I will smash this ship directly upon them, thus opening the way for your ship!"

A murmur ran through the room, alike from those present and from television images.

"But that will mean your death and the death of your companions," said Albermarle slowly.

"That it will," agreed Toom. "But I am willing to die for the Empire!"

He turned to face the rest of his crew.

"As for the rest, they can be transferred to the other ship. I will guide it myself."

But a thunderous shout came from his crew.

"We will follow you, Toom, for the glory and safety of the Empire!"

Uaaii's mechanical voice was heard above the others.

The two ships hovered in space for an hour, filling their accumulators to capacity with the etheric energy. Then they leaped downward to the first planet, Toom's ship in the lead.

WITH frightful velocity they streamed past the planets, mocking the beams of red and yellow that lamely tried to center on them. Once again they neared the massed ships that hid the face of the planet from the invaders. Velocity unabated, the foremost of the Solarian craft shot downward, while the second ship slowed somewhat to await the crash.

A flaming jewel of brilliant scintillation, Toom's ship smashed into the ranks of the enemy and plowed through them invincibly and irresistibly, opening a gaping hole.

Albermarle put a hand over his eyes as he saw the glowing hot ship dip groundward, a jagged edged, broken shell. Then he sprang into action. At his orders the remaining Solarian ship streamed through the hole before the enemy could fill the gap, and raced madly to the portion of the planet facing the distant Solarian Empire. From high above it they commanded an extended view of the planet's surface.

"There it is!" cried Xixxus.

The housing for the projector was a truly gigantic structure, immensely high and wide. From its roof through a hole extended a titanic metal tube. All around it the atmosphere sparkled and glinted from the by-products of its terrific energies. The Blue Beam was invisible here but one and all the Solarians hurled curses upon it.

But Albermarle knew that they must act fast. Already red and yellow beams were flicking about them as they neared the structure. And the

fleets of black ships above descended upon them with a shower of rays and bombs.

Using the stored etheric energies, the disintegrators poured down their withering breath. With a grinding and crashing that echoed even through the diamond hull of the warship, the projector housing collapsed.

"Vengeance!" screamed Albermarle flinging his arms aloft. "We have done our work. The Blue Beam of Pestilence is no more! Now, my faithful warriors, let us fight to the end, for there is no escape from the fleets above us!"

But a mechanical voice startled him by saying:

"There is no death for us, Commander Albermarle. Look—the black ships are falling! That building evidently housed not only the Blue Beam projector but also the power which runs their ships!"

True it was. As if the sky were falling, all the black ships gyrated downward, completely unpowered, to smash on the ground, piling up in great heaps. A number of the falling ships struck the hull of the Solarian ship, but with slight effect.

The gunners, lacking anything to do, now that the enemy ships were gone, crowded to the different ports and gazed at the picture of heaped up débris that covered the ground almost completely. Of the projector there remained nothing. It had been disintegrated to a mist that yet swirled in the air.

One and all they looked to Albermarle as he spoke:

"Let us silently honor the heroism of our fellow warriors, who gave their lives gladly, that we and our peoples might live on!"

For a long minute there was silence in homage to the martyrs.

Then a murmur of joy ran through the Solarians. The blight of the Blue Beam was gone! Heartening news came from the distant Empire. Already the people had quieted down coincident with the disappearance of the beam, and the Council was already taking steps to rebuild the unity of the Empire which had been badly shaken.

Then Xixxus spoke to Albermarle:

"Now that we have the opportunity, I suggest wiping out the enemy altogether. Every vestige of their civilization should be destroyed for did they not boast that they held in thralldom six other planetary systems? They are tyrants. They deserve death and extinction."

But before Albermarle could answer, the radio room burst in excitedly.

"Commander Albermarle! There is a call here from some unknown party!"

"Who is calling?" asked Albermarle as he was connected to the voice.

"We are the Gulgian Empire, subject to the Star of Fifty-Six Planets. We have followed the progress of your battle with them through our instruments. We are now instituting a revolt against our tyrannical masters who conquered us with the Blue Beam long ago. They enslaved us but now we are revolting and killing them here in our planetary system. You have completely destroyed the Blue Beam projector?"

"Every vestige of it," assured Albermarle.

"Then all is well," came from the ether. "You see, we never dared revolt before because of that constant threat of the Blue Beam. Now that it is gone we will finally lift the heavy yoke!"

After that a series of calls came from each of the other five subjugated

(Continued on page 114

» » STATIONS

By

WILLY LEY

PROMINENT AUTHORITY ON ROCKETRY, SPACE FLIGHT AND ASTRONAUTICS

IF somebody put the question to me of how the development of civilization would have been different — compared to actuality—if it had taken place on another planet, say Mars, I would hesitate very much to give any definite answers. There are too many more or less accidental factors involved that could not be determined just by logical thinking. And many of the fundamental facts are not even known well enough to serve as a basis for reasoning.

About one particular point, however, I would be quite certain. Space Travel would already exist if we lived on Mars.

There are various reasons for such an assertion. One is that the gravity of Mars is so much smaller while the energy stored in chemical compounds that might be used as fuels is necessarily the same as on Earth. Mars' "escape velocity" is only 4.97 kilometers (3 miles) per second as compared with that of Earth amounting to 11.2 kilometers (7 miles) per second. Which means that a space ship with motors having an exhaust velocity of 5 kilometers per second (a very efficient rocket motor using hydrogen as a fuel with liquid oxygen or liquid ozone could produce such an exhaust velocity), would have to carry only 2.72 times its own weight in fuels to attain escape velocity. To escape Earth's gravity the same space ship would have to carry at least ten times its own weight. That's the reason why space ships are difficult to design.

BUT Mars' lesser gravity is not the only reason. Even more important for the solution of the problem are its two tiny moons, each about six miles in diameter and circling the planet at distances of 5,860 miles (Phobos, in 7 hours and 39 minutes) and 17,160 miles (Deimos, in 30 hours and 18 minutes). It is evident that the nearness of these small moons would increase the efforts of Martian rocket enthusiasts considerably and silence the critics at the same time.

And after space travel were an accomplished fact Phobos and Deimos would be even more valuable. To reach them less than escape velocity would be needed, to depart from them would require only very small quantities of fuel. Martian space ships, therefore could set out on their exploratory trips with full fuel tanks after re-fueling on their moons. A similar advantage would hold true for returning space ships.

It would be much easier to land on one of the moons than on the planet itself, not only because they exert hardly any gravitational influence but also because the velocities of a returning ship and of one of the moons would match more closely than that of the returning ship and the planet. Thus a space ship could make a safe landing on a moon even if its fuel supply would be so low that an attempt of landing on the planet would be plain suicide.

All this certainly sounds nice but ap-

IN SPACE « «

Space travel will not be a reality by first building a space ship, but by constructing a practical space station as a take-off point

parently it does not help us very much to know these things since we are not living on Mars. Our own moon unfortunately does not offer any of these advantages. It is so far away and so huge itself that an attempt to use it as a fuel depot for space ships could be compared to a fuel depot in Cape Town for liners scheduled to cross the Atlantic from New York to Le Havre.

However, the existence of Phobos and Deimos is valuable to us even though we live on Earth. It constitutes an example of what space travel could gain by having near and comparatively small bodies like them around. In a way it is the same problem that confronted the pioneers of transatlantic air travel fifteen years ago. "If there were an island midway between America and Europe" they said. And since there was no such natural island in the desired position they contemplated the construction of an artificial (floating) island, as fuel depot, repair shop and temporary haven in bad weather.

EXACTLY the same idea exists in the realm of the growing science of astronautics. If there is no Phobos or Deimos around, why not build one? The idea may sound preposterous at first glance but actually it is very sound. It was introduced into science for the first time by Professor Hermann Oberth who wrote in his book "Die Rakete zu den Planetenräumen" (I am translating from the second edition of 1925).

"If we make space rockets of very large size circle around Earth they represent a kind of small moon. They don't have to be capable of descending to Earth anymore. Connection between them and the planet can be maintained by smaller rockets so that these large rockets (we'll call them observation stations) can be re-shaped more and more for their special purpose. If the steady absence of a feeling of gravity should have unhealthy consequences—which I doubt—two such rockets could be connected by a wire rope of a few miles in length and made to rotate around each other."

It may be necessary to add a word or two about the scientific principles of such a station. A body, moving horizontally at a velocity of about eight kilometers (5 miles) per second, does not drop to Earth anymore unless its velocity is influenced by air resistance or similar factors. This phenomenon which has received the name of "circular velocity" can be explained easily in simple language. It occurs whenever the spherical surface of a planet curves downward under the moving body just as fast as this moving body is pulled down by the gravity of the planet. Thus, although falling and falling without end it can never touch the surface of the planet, it falls *around* it. The horizontal velocity at which this occurs depends upon mass and size of the planet in question, in the case of Earth it is about 5 miles per second.

Naturally no fuel would be needed to keep such an artificial moon in space once "circular velocity" has been imparted to it and the orbit is well established.

WHEN Professor Oberth wrote the words quoted above he foresaw many of the possible uses of such a station, astronomical and terrestrial observations, scientific experiments of all kinds under new conditions (large airless space at the disposal of the experimenters, freedom from gravity drag and other disturbing factors) and he also realized the advantages for space flight itself. But he believed that such a station would be one of the later results of space travel.

To give but one example: A space ship designed to take off from Earth for a trip to the moon and back, carrying several passengers and necessary provisions, would weigh about as much as a medium sized ocean liner. In order to take off the amount of forty tons of fuel would have to be burned during the first second. If the ship were to reach a station 5000 kilometers (3000 miles) from the surface the amount of fuel to be burned during the first second is only about two tons. To take off from the station for the Moon would require only 400 pounds of fuel per second!

The advantage does not lie in the saving of fuel, as may be thought. The ship would have to re-fuel on the station and since the fuel for re-fueling has to be brought there—thus necessitating the expenditure of more fuel to carry it up—there is no saving if the whole procedure is considered. But it will be very much easier to build rocket motors burning two tons of fuel per second at the most than to construct monsters with a capacity of 40 tons per second.

IT is not impossible that all attempts of flying to the moon may be foredoomed to failure in spite of theoretical probability just because the rocket motors cannot burn sufficient quantities of fuel at the beginning of the flight when the ship is still heavy with more fuel. But there is hardly any doubt that rocket motors powerful enough to impart circular velocity to the ship will be developed some time. And with circular velocity the station in space can be constructed and after that space travel has ceased to present difficulties.

Even while building the station the engineers in charge will experience a number of pleasant surprises. They will have to keep in mind constantly that every pound of material to be transported into space will require tremendous amounts of fuel. But they will also find that the number of pounds to be carried will be surprisingly small.

Since the whole thing is falling freely all the time there are practically no strains and stresses to be considered, everything can be built so flimsily that it would not last for seconds on the surface of Earth. The reflecting mirror of a large telescope, for example, could be thinner than a watch crystal and to hold it in position three quarter inch magnesium rods would be ample. . . . Oberth, when reading this, will probably mutter that a tenth of an inch would do just as well. And he'd be right.

Realizing all the advantages briefly touched in this article it is easy to predict than one day there will be a station in space. The idea will not be abandoned like that of an artificial island in the Altantic because a station in space will always have definite uses of its own and will be valuable to space ships even if they (say after the advent of atomic power) would not need it anymore.

SCIENTIST

by RAYMOND Z. GALLUN

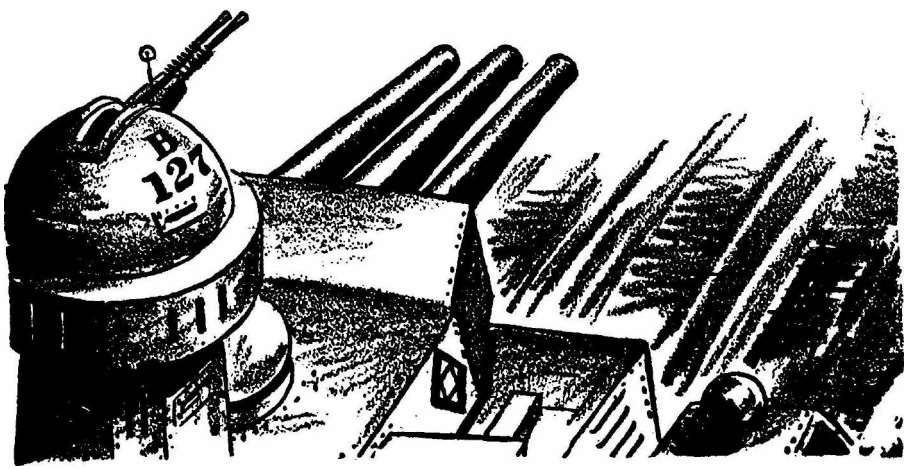
"THE funny part of it is, Prof Norfolk is a swell old guy," Frank Trasker told me quietly. "The rumors that are scaring everyone are correct, though, Arnie. It's evident that Prof has invented a weapon beyond our dreams. Artificial gravity of a concentration and power never known on Earth!"

Frank Trasker and I, Arnold Farwell, are pals. Being observers for International Newscast, we've chased plenty of wonders around the world together. But this one was by far the most fearsome. Frank's weathered face was fairly grey with awe as he spoke, the truth of his words evident before us in the blazing, Sahara sunshine.

A fighting column of armored tank-units had been wiped out there on the hillside just the day before. . . .

Frank was picturing in words just what must have happened. "No wonder everybody's afraid of the man who can do things like this, Arnie," he whispered. "Ever since the stories began to grapevine out of the desert, it's been like that. No wonder the Western European Federation sent out this army to capture Prof and his lab here at all

Norton made the greatest discovery of all time—and became Earth's outcast because it was also the foulest weapon of history



DISOWNED

cose, to make the world safe from what he might try to do. Poor devils, they never had a chance! Suddenly, as the gravitational force acting on this hillside was multiplied, their weight increased maybe a thousand times, just for an instant. But imagine a man suddenly weighing 150,000 pounds! Imagine a tank of a hundred tons suddenly tugged by a force a thousand times as great! You can see how the rocks were crushed to dust and rubble by their own weight, and how steel crumpled and fairly ground itself to powder. . . ."

Frank didn't say any more about the men—the soldiers. But their flesh had fairly oozed from their skeletons, pressed through the fabric of their uniforms like a liquid. It was ghastly. The hideous event that had happened here in the Sahara yesterday, might have taken place on some gigantic dead star, whose mass and gravity are beyond conception. But that it had occurred on Earth didn't seem quite graspable.

Still, knowing Professor John Norfolk, who, years ago, had been our genial little physics lecturer at the University of Columbia, the impulse of both Frank and me was to defend his actions. Though high-strung and sometimes quick-tempered, he was one of the most big-hearted men we'd ever run across. There was only one person he didn't get along well with. That was Norman Vesper, a tall, thin-faced, caustic rival scientist. At the U. it had been talked around that in their younger days they'd had a squabble over a girl.

"These soldiers must have died a quick, easy death, Frank," I said. "Besides, they came with intent to kill or capture Prof. He had a perfect right to fight back. . . ."

"Sure," my sidekick agreed.

But we knew that somewhere on the other side of the hill was Professor John Norfolk's laboratory stronghold. And though we might have good reasons to excuse his actions, we couldn't forget the panic-breeding truth that he was the most powerful man on Earth, now. With little effort on his own part, he could destroy whole armies. No matter how philanthropic he was by nature, no one could ever relax while this condition existed.

OUR course of action was fairly clear. We were more than news-gatherers, now. We were ambassadors to the man whom the whole world could not fail to hold in fear and suspicion. We had to find out his motives, if we could.

"Come on, Frank," I urged. "Let's get started."

We left our rocket plane in the desert hollow behind us, where we had landed it. Nervously we climbed the hill, and at its crest we paused to peer ahead. Beyond a flat stretch of dunes, there was a high, rugged hill, richly fringed with palms. Fort-like walls of mud-brick, resembling those of an Arab village, loomed behind the palms. But over the ramparts peered something incongruous.

It was a flat, ebon-hued thing, supported at an angle in a glittering steel frame. If it had been silvered, instead of dead, Stygian black, I would have thought of it as a gigantic, movable mirror. Perhaps it was a mirror of sorts, not to reflect light, but to direct a concentrated beam of artificial gravity.

My blood ran cold when I saw that that nameless flat object was turning on its swivels in our direction. My guesses about the nature of the thing, seemed to be proving themselves true. And it wasn't so difficult to guess further how that armored column had been destroyed.

"Those soldiers came up the slope

we just climbed, Frank," I whispered. "But as they were doing so, the gravity beam reflected from that 'mirror' was turned on, acting right through the mass of the hill itself. The super-attractive force tried to pull the soldiers right through the rocks and sand. . . . I wonder—will Prof try to give us the same dose?"

My pal tried to put himself and me at ease on this score, by remembering something. "Prof gave me fifty bucks once," he said. "To help pay my tuition at the U. when I was almost broke."

Sure. It was all a paradox, all right. Prof, with a kindly red face that would have made Santa Claus envious. And yet this mass destruction we'd just seen. We just didn't know where we stood. But we couldn't let our nervous doubts stall us now, of course.

I took a handkerchief out of my pocket, and waved it toward the fortress en lieu of a flag of truce. Both Frank Trasker and I are big men. So we squared a foursome of husky shoulders, put on our best smiles to show that we didn't mean any harm, and continued ahead.

We didn't make more than twenty paces that way before the black mirror in its frame above those mud-brick ramparts, began to emit a low, weird hum. Or maybe it was the gigantic, unknown mechanisms attached to the mirror, that produced the sound.

NEITHER of us was given a chance even to cry out a warning. I felt a sudden, powerful tugging at my body. My feet left the ground, and I shot upward at an angle toward the crest of those frowning walls. Frank, his arms and legs gyrating helplessly in the air, was flying along beside me.

I guess we both thought for sure that we were finished. But though we were scared half to death, the gravity beam being applied to us wasn't powerful enough to give us any real discomfort in itself. And it only lasted a moment.

Over the walls, the force was gently released, and we settled without injury to the paving of an inner courtyard, where the gravity machine stood, a huge, awesome mass of dark metals.

Men moved around us—Arab workmen. And Professor Norfolk faced us as we scrambled to our feet. No, he didn't look like a fiend at all. Just a little older and more care-worn than when we'd last seen him, years before.

"I might have known it would be you two newshawks," he said gently. "I heard over the radio that you were coming here to Algeria to see me."

"Prof," I burst out, interrupting him. "The whole world's upset about you—worried that you'll try to dominate everybody, now that you've proved that you can do it!"

He nodded a little tiredly, his eyes squinting against the Sahara sunshine. "I understand their fears," he said softly. "That there's no truth in them, doesn't make any difference. It's hard to trust a man who possesses the power to override every law and military force on Earth—even though he has no intention of using it for such a purpose. . . ."

"But Prof!" I interrupted again. "How about that armored column of the Western European Federation, that you destroyed? Couldn't you have avoided killing those soldiers? It was pretty awful, wasn't it?"

He bit his lip. "I guess it was," he admitted. "I might just have increased the gravity enough to pin them to the ground and make them helpless. But various nations have been after me so long, promising, threatening. I was angry and nervous, knowing that those soldiers wanted to kill or capture me—as though I were a dangerous criminal

—when, in everything I've done I've had the good of mankind uppermost in my thoughts. I lost my head for a moment."

He paused there. Then he went on, talking feverishly about his hopes. "Space travel is possible now—and a hundred other things," he said. "Why, if the gravity over the Sahara were decreased very slightly, the atmosphere over it would be of less weight. There would be rising currents of air, and winds sucked in from the oceans. Rain would fall, again, here, and the desert would be turned into a paradise of growing things. . . ."

As he talked to us thus in vibrant tones, Norfolk had a dream in his face. I couldn't help but believe in him, then. But somehow, too, I felt that faint ghost of mistrust. Here was a man whose discoveries and inventions had made him a demigod. But you inevitably feel inferior and suspicious with somebody like that around. Though his intentions seem perfectly philanthropic, there is always that certain knowledge that he could destroy you and everything you hold dear, if he just happened to feel like it—if the lust to assert himself was suddenly awakened.

"Why don't you just publish your discoveries, Prof?" Frank Trasker demanded. "Then there wouldn't be any secrets. Everyone would be able to do just what you can do. You wouldn't be special—separate. You'd be accepted again as something normal."

"I've thought of that often," Prof returned. "But it's no good. My invention has hundreds of untouched possibilities in war. Whichever nations developed my discovery best along such lines, would inevitably become a menace. So I've hung onto my secret, feeling that it is safer in my hands, even though it puts me in a very unhappy situation."

PROF was trapped—had become an exile of power. I realized it then more clearly than before. He, a mild little scientist, outcast because he had soared a little above the mortal. It was one of the tragic paradoxes of life.

"There's been too many lurid radio and newspaper stories about you, Prof," Frank burst out. "Let Arnie and me take pictures of your apparatus here, for publication and telecast. Let us write up your true history, without sensationalist propaganda. It will drown out some of the scareheads that have frightened everybody into hating you. Even scientists like Norman Vesper."

Norfolk grinned briefly then, remembering his old rival and enemy—perhaps the most brilliant mind in physics, other than himself. Tall and thin and harsh.

"All right, boys," Prof said mildly. "You can take your pictures—ones that won't show too much—and tell your story about me. But I haven't much hope that it'll do any good."

Almost gleefully, Frank and I went to work, photographing gigantic coils and atomic energy power-units—things meant to generate and mold gravitational forces artificially.

But long before we were finished, we saw a rocket plane streaking far overhead. . . . Probably another prowler, sent out by the Western European Federation. Doubtless there would soon be another attempt to get Prof, for the world was a little mad with doubt.

We said goodby to our old physics lecturer, and left his lonely desert workshop in a manner more normal than our arrival. We flew back across the Atlantic to New York, determined to soften the world's opinion of an exile. But we moved a little too slow for time.

Just as we reached the lofty landing stages of New York, the news came by

radio. The Federation, frightened to fury by the catastrophe its first armored column had met, was making an aerial attack on Norfolk's stronghold.

Frank and I didn't spend more than an hour in New York, preparing our story, and turning our pictures over to Newscast. Then we were flying back across the ocean.

We arrived at our destination at night. A sort of vague, dry mist, like a dust cloud, hung over the desert. And when we dropped a flare, we saw only a vast crater in the ground, where the Norfolk lab had been.

"They got him," Frank croaked hoarsely. "With bombs. Blew all of his inventions out of existence."

It seemed an awful shame. My throat tightened a little, too, because I'd liked Prof plenty. But then we looked up at the desert stars, from the glassed-in cabin of our ship. Up there was something that shouldn't be. A tiny, redly luminous blob. It seemed to float thousands of miles out in space. A jagged lump, like a little moon, enveloped by the halo of an atmosphere. A second satellite of Earth.

FRANK had an inspiration, then. He turned on our radio transmitter, and moved the selector loops of the receiver so that they would pull in any waves that might be coming from over our heads.

"Hello!" he called into the mike. "Frank Trasker speaking to Professor Norfolk. Do you hear me, Prof? Do you hear me? . . ."

His hunch was right. There was a distant crackle in the radio-speaker, mingled with the humming of vast, struggling machines, somewhere in the distance, up toward the stars. And then came Prof's voice:

"Hello, Frank. I thought perhaps you and Farwell would be coming back toward where my lab was, as soon as you heard about the attack. But I dismissed my Arab workers, and got away just as the bombers arrived. I could have defended myself but I didn't want to cause any more deaths. So I'm taking my lab, and the hill it was built on, a little ways out into space. . . ."

I tell you it was a little blood-curdling —hearing that far-off voice stating a miracle so matter-of-factly. Frank and I looked at each other wonderingly. The crater below—it wasn't made by bombs—but by the disappearance of a whole hill into the void! Controlled gravity. Norfolk had used his vast, versatile invention to produce another wonder! It was weird, listening to the steady groan of those tremendous machines, over the radio. But those sounds, with their sullen suggestion of incredible strength, blotted out any disbelief that I may have felt.

"I can't talk any more now, boys," Prof announced. "The apparatus is sputtering a little, and I've got to attend to it. Try to call me later."

His voice clicked off, but above our heads that little world he had created still glowed, defying would-be destroyers who, themselves, felt only that they were battling to curb a man who had become an unpredictable danger.

"I guess there's nothing for us to do right now but go back home," Frank said.

New York proved to be a bee-hive of fears and speculations. Norfolk's latest demonstration of his wizardry only served to emphasize everyone's terror of him. It was final proof that he could do almost anything he wanted.

And they weren't done fighting him yet, by any means. "Rockets," the man in the street was saying. "Rockets loaded with high explosives, and shot up there above the atmosphere, to Norfolk's hideout. We'll get him yet."

FRANK and I went to call on Norman Vesper. He was like the rest of the people—grim. Only more so, because of that old rivalry.

"If the explosive rockets don't destroy Norfolk, I will!" he told us sharply. "Those pictures you fellows took of his apparatus—they enabled me to understand his principles a bit better. . . . Yes, I suppose he might be honest, as you suggest, but with the powers he's got, I wouldn't trust Norfolk even one-tenth as far as I could see him!"

It was hopeless, of course, for us to attempt to battle down that world-wide suspicion. Men who have risen dangerously above their fellow mortals, don't belong on Earth. Frank and I recognized this probable truth ourselves, even though we admired Prof tremendously.

Three days later, they started that strange bombardment of the tiny moon Norfolk had made. Unmanned, radio-guided rockets, went shooting up from the outskirts of New York, and a score of other great cities on five continents. Eerie repulsive force, which seemed to act like reversed gravity, turned the explosive missiles aside as they approached their target. Prof was defending himself, but so far he was refusing really to fight back; and sooner or later weariness would get him, and his defense would weaken.

Frank and I tried repeatedly to call him by radio, and on the fifth day we were at last successful.

"I'm wearing out, boys," he told us. "The projectiles keep coming so fast I have hardly a chance for more than winks of sleep."

"Then maybe we could help you," Frank offered, after he had consulted me. "We have a plane with a sealed, high-altitude cabin. We'll fly it over New York, and you can pull us up to your moon with a strong gravity beam. We'll help you fight."

Prof didn't protest our generosity—putting our own necks in a noose. That was true evidence that he was really being ground down from lack of rest. He needed aid bad.

"Okay," he said. "And thanks a million."

Thus, on the night of that fifth day we were in our rocket ship. We felt a steady tug upward. Swiftly we and our sealed plane were pulled into space. The journey was accomplished in about two hours.

That tiny moon, circling Earth, had an atmosphere, brought up with it from below, and chained to its surface by an artificially strengthened gravity. In the warm sunshine, the palm trees still grew. We were drawn to a landing within the walls of the fortress.

PROF NORFOLK was there to meet us, looking very done out. "Thanks for coming, boys," he said again, feebly and gratefully. "And now I'll show you how to work the gravity machine, which can be used almost entirely for defense, now that this little moon has been jockeyed into a stable orbit. . . ."

Within half an hour, Frank and I had the defensive technique down pat. Just a matter of sighting through a small telescope, and moving some levers, whenever we saw an explosive projectile coming up from Earth. A beam of reversed gravity, leaping from that black mirror, would push the projectile aside, deflecting it from its goal.

"This ought to be fun," Frank laughed as he took over. And of course it was—at first. But as the hours went by, and the missiles kept coming, it got monotonous and nerve-wracking. We exchanged shifts, Frank and I. We slept and worked alternately, but those unmanned rockets kept coming.

Prof. Norfolk was busy almost all the time in the laboratory buildings. An outcast from Earth, his position was pretty bad. He could ride this tiny hilltop moon round and round the planet, remaining constantly the subject of dangerous pot-shots from an organized world that wanted to be rid of him for good. Or he could use the gravity machine again to take his satellite farther out into the awful depths of space, becoming forever an exile. Besides two alternatives, there was just one other.

After a couple of weeks had passed, and Prof was haggard and worn and half crazy, he hinted what this third alternative was. "I ought to teach them a lesson," he hissed at us. "I ought to destroy a few cities—pull the buildings into space. Maybe that would teach people at least to leave me alone!"

I suppose we should have jumped Prof right then. Well, we didn't. He was such a good old guy that his words came sort of as a surprise, even though we knew beforehand that he was cracking. When it finally occurred to us what we ought to do, he got into one of the buildings, and locked himself inside. A few minutes later, he had a secondary beam of gravity pulling us to the ground. Next thing we knew, we were handcuffed to a stout metal pillar in the courtyard.

"Nice kettle of fish," Frank muttered. But arguments were no good now. Prof. Norfolk didn't trust us, and we certainly didn't trust him. We had a pretty good idea that he was going to work on Earthly cities before very long.

SOME more rockets approached, and he flicked them aside expertly with his beam. But then came something that wouldn't deflect. The gravity beams pushed at it uselessly. It kept right on, straight toward us. We saw now that it wasn't a rocket at all. It was spherical, and it didn't throw out any jets, and there was an ominous lump bulging from its flank. This craft was something entirely new.

Prof was tugging and cursing over the controls of his gravity machine, but though it was still functioning perfectly, nothing resulted. That spherical ship kept approaching.

There was a radio there, beside the setup in the courtyard. We'd been using it to get news. Now it began to blare in familiar, caustic tones:

"I've got you, Norfolk, and you're helpless. You can't do a thing to me. I've found a way to neutralize your force. Those pictures of your apparatus that were published, helped tell me what I didn't know about your apparatus. I've been working on the same thing for years, and I've found the antidote at last. I've got guns trained on you now. Plain ordinary guns, but I can blast you and all your marvels to smithereens if you don't behave. . . ."

I think I felt sorrier for Prof at that moment than I had at any other. It had seemed for weeks that everything he had accomplished was for nothing. But now, as that globular craft, piloted by his oldest enemy came to a feather-light landing there in the courtyard, real defeat was apparent. Prof sagged tiredly against the controls of his machine.

The globe ship opened, and Norman Vesper stepped out, tall and gaunt and menacing. He held a pair of ray-pistols, cautiously aimed. Frank and I just stared. Seeing the final downfall of somebody big, isn't always pleasant.

And then Prof surprised us. "I guess this is just what I've been needing all the time, Norman," he said simply, the

wild, hunted light gone from his eyes. "We can be friends now. Space travel on a vast scale is going to be possible. Maybe we'll be reaching even the stars in a few years. We'll reduce the gravity of the Sahara, and bring the rains. We'll push back the ocean here and there, and reach the rich mineral deposits at its bottom. . . ."

Vesper's stern expression softened in momentary puzzlement. Frank looked at me and I looked at him.

"What's Prof talking about?" I whispered hoarsely, confused.

"You dope!" Frank came back at me. "Don't you undertand? The world can't mistrust Prof any more! Because his invention is harmless, now that Vesper has found the antidote. Nobody can use gravity for destruction after this! It will have to be used to accomplish good, or not at all!"

I felt like a fool for not having figured it out for myself. The man who had become a demigod was human once more. And his banishment was over.

THE MATHEMATICAL KID

(Concluded from page 66)

then I ran away, and I hid in an alley, and waited until your cabin boy came along, and then I hit him over the head with a sandbag, because I had to get his—"

OLD SCRATCH lost his grin. He purpled.

"You hit him over the head so you could get his job?" he yelped. "So *that* was why—"

Suddenly he began to laugh. He got so he couldn't stop himself. He began to laugh tears out of his eyes.

"He hit him over the head!" he yelled. "So help me, if that ain't the funniest—"

About that time I grabbed hold of the skipper and dragged him toward an automobile.

"Come on! We got to get off this off-center planet before you get that way, too!"

I never did like that other cabin boy anyway. No brains. Know what I mean?

(Continued from page 102

empires, expressing the same joy that the Gulgian had.

"We will go back to our own sun," said Albermarle to Xixxus. "I think we can safely leave the rest in the hands of these other peoples who have been under the subjugation of CX-88 for ages, the Higher Spirit alone knows how many Sikka."

When the lone warship reached Earth, a tremendous ovation was given to Albermarle, but he waved a hand and said:

"Citizens of the Solarian Empire. You owe everything to the crew of the other ship and to Toom V-3-X-44 of Jupiter and Uaaii-23 of Venus. Honor them as unselfish martyrs for the rest of your days."

And Siglo Albermarle was Supreme Head of the Solar Council for many Sikka after that.

THE END

Prometheus

By ARTHUR K. BARNES

Dr. Duvernet, was he devil or savior? That's what the whole world was wondering!

IT would seem that the broad outlines of the Scourge of '82 have been kept sufficiently fresh in the minds of the people so that any other literature on the subject would be a sin in the direction of superfluity. Innumerable newspaper articles from all angles of the episode, reams of historical novels concerning themselves with those troublous times, mountains of scientific scribblings—all these have combined for a decade to keep the incredible horror of the Scourge one of the most talked-of events in all world history. As is the case with all epochal, much-talked-of events, however, truth has become sadly distorted with the passing of the years. Facts have been twisted to fit writers' imaginations; situations have been scrambled to suit the demands of fiction; legends, fired by actual feats of valor and heroism during those terrible months, have sprung up like jungle vegetation, obscuring, and all at variance with, the real facts of the case. It is for this reason that the writer is minded, once and for all, to straighten out these many misconceptions and relate the true story of the genesis of the Scourge.

Perhaps not the least ghastly part of the business is the fact that the whole thing started from a joke. If it had been a good gag the irony wouldn't have been so bitter, but no—it was an ancient, moth-eaten joke that hadn't raised a genuine laugh for fifty years. To be exact, printed evidence has been found that the thing first saw daylight in newspapers dated as long ago as 1930—more than half a century before it sparked the mental tinder of the man who brought down about our heads the greatest catastrophe of modern times. It was like a jingle tune which, as the thematic melody of a symphony fed by overtones and variations, swelled until it became a veritable diapason of terror.

IT was hot, stifling in that shallow little ravine in the Del Rey hills, though I could see a breeze rippling the curtain of brush a few inches above my head. The flies were bad; they had already found the body. Looking back toward the clearing I could see the lab. It was empty. And where the door had been now lay ruin. The frame was demolished, and a talus of shattered bricks and powdered cement lay at either side of the gap. The door itself had been burst from the top hinge and lay drunkenly at full length to one side. The key was still in place where it had been forgotten after last night's shock, permitting this man to carry out his scheme of jealousy and revenge. I looked down at him again. He was

lying on his stomach with arms outspread. One leg was drawn up, as if he had been struck down in full flight. He had paid the highest price of all. It was Ammerman.

On the far side of the clearing where the road entered it a small group of newspapermen clustered on the shady sides of their cars. They hadn't seen the wreckage of the lab yet; they knew nothing of the body in the ravine. They just listened to the high, clear voice of the little man who spoke to them. I listened, too, making out an occasional phrase, and knew it for the voice of my employer, Duvernet. It sent my memory back to scene after scene of the past months, like an old magic lantern flashing its slides on a screen.

Duvernet! Doctor Pierre Duvernet! What anguish and thrills and heartache and awe that name inspires in every man and woman even to-day. I had no inkling of what the future was to hold for that man and myself as I read his "help wanted" ad. in the paper. A name destined to be cursed as synonymous with all that is cruel and despicable and vile, to be hailed with hysterical joy and praise; a name to be spit upon and sucked into the whirlpool of disgrace and oblivion, only to be spewed forth to the very heights of fame and adulation; a name to be trampled into the dust, then carved on monuments as the preserver of nations, heaped with blessings and benedictions as the savior of the world.

I remembered our first meeting. Duvernet already had some reputation as an endocrinologist and scientist of note. But when I first laid eyes on him, I very nearly burst out laughing in his face. You know how political cartoonists from time immemorial have pictured France—a little man with black goatee and thick eyebrows, dressed in top hat, morning-coat and spats? Well, Duvernet had got himself up as an exact replica of this figure. My first glimpse of him came as he strode up and down the carpet in his Los Angeles office, beard waggling, hands waving, muttering alternately to himself, "*Zut!*" and "*Zut, alors!*"—a dynamic, mercurial, preposterous little Frenchman with his top hat slanted rakishly over one eye. And despite his appearance there was that about him which commanded respect, and perhaps fear, too. At least it did in my case.

He pounced on me, emitted a few *zuts!* and demanded:

"You are an experienced lab.-man, yes?"

I answered truthfully, "No, I'm not. I'm just out of school, and spent most of my time while there playing football. But I took several lab. sciences and used to potter around the labs. at odd hours."

Duvernet leaned close and sort of leered up at me. "Very clever young man, I presume?"

"No." Still truthful.

"Excellent. Most excellent!" He patted me as high up on the back as he could reach, played a tune on the call-button fixed to the side of his desk. Presently a young-looking man with tired eyes came into the room. Duvernet rushed at him.

"Ammerman! My dear Ammerman!" It was hard to visualize the man's speech without a series of exclamation points after every phrase. "I have just the fellow we want. Everything arranges itself nicely. Take him. Instruct him. From to-day henceforth see that I am not molested."

Ammerman shook hands, smiled sadly, and led me from the room . . . .

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And now he lay lifeless before me in that suffocating little gully, face down in a welter of blood.

I recalled our brief chat as we walked down a corridor, and his explanation of Duvernet's relief at finding a man suitable to take over the routine duties that interrupted his experiments so often. We stopped before a door, which Ammerman opened, stepping aside for me to enter. "Cloakroom," he offered. "Lockers for your aprons and gloves."

I went in, looked around, and stood paralyzed. Climbing around on top of the row of lockers were a half dozen undeniable fish!

I looked around at Ammerman, mouth working but not having any great success. His smile was hopeless. "Several species of fish are known that are able to remain out of water for varying periods. The lung-fish, gurnards, and others. Duvernet has made some adjustments on these specimens, permitting them to live entirely away from water."

I guess I must have still looked pretty much at sea, for Ammerman had gone on to explain about the joke that started the whole affair.

"It really started at a party the Doctor attended some time ago. One of the men there got tight and started ribbing Duvernet about his scientific reputation, pretending not to believe some of his achievements, belittling others. Finally he told a joke about a man who had caught two fish and kept them alive in a pail of water. Gradually, by removing a portion of the water each day, he trained the two fishes to live on dry land. They became quite fond of him and followed him about like dogs." Ammerman paused, looked at me, sad-eyed, to see if I were inclined to laugh. I wasn't. So he sighed and went on, "Someone asked what became of the fishes, and this fellow said that it rained one night, and while out walking with his pets they fell into a puddle and drowned."

I smiled then, but more in pity than anything else. Ammerman nodded.

"Unfortunately, Doctor Duvernet has no sense of humor whatever. He took the whole thing quite seriously. And when this souse guffawed and nudged him and said he bet Duvernet couldn't do that for all his degrees, the Doctor went right up into the air and vowed he'd better that experiment if it were the last thing he did on earth."

I LOOKED closely at the strange creatures on the locker. Some of them had developed three spiny "legs" on either side, growths from the fin-rays, and walked along like old men determined not to give in to approaching senility; others hitched themselves along more slowly. I suggested that the experiment was apparently a success, and asked why he needed more helpers.

"Oh, one idea led to another. He has something new on tap now. You'll find out."

That was January 17, 1982 . . . . Now I had found out, and so had Ammerman, to his cost. Clothes hung in shreds about his thin frame, and his back had been literally torn apart by some savage attack with knives—or fangs.

I recollected those early weeks together, just the three of us. My duties had by no means been arduous. In the two main rooms of the big lab. building Duvernet had installed several series of glass aquarium tanks, most of them containing a great variety of marine life. It was my job to regulate the flow and temperature of the water, feed the specimens, and gen-

erally take care of the layout as instructed. Much of my leisure time I spent watching the fascinating activity of Duvernet's captives. Perhaps the most entertaining of the tanks, and the one from which Duvernet most frequently took specimens on which to work, contained a number of small fish about the size of a trout, striped. They were extraordinarily vicious and attacked everything else placed in the tank if the intruders weren't too large. In the latter event, they made use of a small gland they possessed to release a gas into the water. Although the gas dispersed quickly, it discolored the water and apparently distorted vision, allowing the striped terrors to reach the safety of their rock castles on the bottom.

Throughout February and March I had tended my tanks and kept my eyes open. Ammerman and I had become fairly friendly, too. He had a shell of reserve, which I quickly ·erced, and a good deal of "snootiness," which I ignored, and we found each other to be regular human beings, with plenty of faults and plenty of rough virtues, and we liked each other the more accordingly. I saw very little of Duvernet, except when he came in to take out more specimens and to see how I was doing and overwhelm me with a volley of *"Zuts!"* whenever I did something not exactly to his liking. It wasn't long, of course, before I found out what he was attempting to do. In the second roomful of tanks were several which contained no water. Some were arranged to be filled with steam; others had no apparent "luxuries" for the tenants except jets for warm air. It was in these tanks that Duvernet placed most of the myriads of tiny, new-born fish that came from his private laboratory. His object soon became clear; he was trying to cross-breed his land-living creations with several of the fish that were unable to live out of water.

The layman will at once laugh and point out the impossibility of crossing genera. There are well authenticated records, however, of many weird hybrids that have appeared on earth from time to time. I knew that. And the fact that Ammerman and Duvernet took it all very seriously was sufficient to make me wonder if, after all, the Doctor might not be on the road to something.

And now I had before me the full fruition of Duvernet's labors, rolling limply beneath my foot, easy prey for the meanest things that crawled.

Success had not been easily wooed. I called to mind the dozens and scores and hundreds of Duvernet's little charges that died almost as soon as they were born. Every morning he rushed into the aquarium rooms, wild-eyed and panting, demanding of me what had happened during the night. Before I could answer he was looking for himself, swearing and groaning, as if each dead fingerling represented an irreplaceable personal loss. There seemed to be something not quite normal at work in the man's mind, but he was indefatigable. Night and day he spent in feverish experiment. For every hundred failures, he had two hundred prepared to take their places. For every thousand dollars lost on specimens, he spent two thousand more. And gradually the lines of progress became more and more clearly defined.

The hybrids produced by the little striped fighter with an unpronounceable name and the strange out-of-water fish seemed most resistant. They lived, some of them, as much as three or four hours after hatching in the dry tanks. Then one of them sur-

vived for two days. Duvernet was simply impossible during those hectic days. He became wildly excited, rattled off great streams of abuse in French at my slightest incautious motion, then tried to berate me in English only to have grammar and syntax go completely haywire. Even Ammerman seemed infected by the Frenchman's enthusiasm. He cussed me out in his mild way nearly every day.

Then one morning Duvernet came to me and said in his precise way:

"No longer, my big friend, will you enter the inner room." That's the way we always referred to the dry-tank aquarium room. "From now on you will confine your activities to the main laboratory."

With which he strode rapidly into the inner room and ostentatiously snapped the inside bolt. I asked Ammerman about it later on.

"My dear Carter," he said, so damned superior that I grinned in his face. "My dear Carter, if you'll just leave the scientific end of the arrangement to us who are competent to handle it, you'll have more time in which to manage the—"

"The dirty work?" I suggested, thinking of the hours I'd spent sweeping floors and scraping tanks, up to the elbows in dirt and slime.

"—the routine matters," was the way he decided to put it.

Ammerman, with no intentional disrespect to me, was obviously quite sold on himself when Duvernet let him in on the secret experimentation, flattered to be the Doctor's assistant, conceited to think that he was the only one in the southwest sufficiently equipped for the position. I was glad for his sake, too, so I shrugged and let it pass.

THAT was April 7, 1982 . . . . And now all intelligence and pride and egotism was as the dust, and Ammerman himself was one with the hot stillness of that dusty little ravine.

I smiled faintly as I remembered their attitude toward me—as a good-natured, easy-going hulk, content to draw my few dollars a day, uninterested in what was going on. But they misjudged me. I kept my eyes open, and it wasn't long before I had learned plenty. To begin with, I knew the reason for the sudden retirement act was an unexpected success in the cross-breeding. Evidently the Doctor had produced one or more hybrids that were going to live, and he was ready for further work on them. I soon found out the nature of the new experimentation, too. It was my duty to check-in all supplies delivered, and I quickly discovered that large amounts of pituitary extract and thyroxin were ordered weekly. True, it didn't appear quite like the glandular extracts I was familiar with, but labels don't lie. From this I deduced that Duvernet was controlling or stepping up the metabolism of his subjects and stimulating their growth as rapidly as he could. And from odd snatches of conversation I gathered the reason for the crossing was this: the weird landfishes that Duvernet had developed with the idea of creating a new genus were lacking in a strongly marked instinct of self-preservation, so he had selected a fish that was a fighter from start to finish and inculcated that quality so necessary to wild-life existence in his new strain.

The Frenchman called a conference early in May, wasted no time in getting to business. "Going to be some changes made," he started out abruptly. "Going to move our quarters.

Out in the hills. Seclusion is what I need now."

He was dressed, as he dressed whenever he engaged in anything with the least formality attached to it, in his top-hat and morning coat. The tails stood out behind him like wind cones as he marched up and down the room.

"You, Ammerman," he stuck out one long white finger, "I shall need no longer. I have your check ready, with a bonus for the unexpected release. You, Carter, I shall want. There is much work to be done."

Under some circumstances it would have been a treat to see Ammerman's face. It went positively green with disappointment and chagrin. But I felt genuinely sorry for him at that moment. My attempts to console he brushed aside with affected dignity.

"I am sorry," he said with great precision, "to find the Doctor so lacking in appreciation for—"

But Duvernet sensed a speech coming and walked out on it. For a minute I thought Ammerman would take after him, as he stood there working his fists, face crimson with fury. But he managed to control himself, and presently he, too, left the place.

That was May 3, 1982 . . . . I never saw him again, alive.

Duvernet's "much work" had consisted in moving, single-handed, the entire contents of the big laboratory. It was all done secretly, after nightfall, and took the better part of a week. The new location I could see quite clearly by stooping and peering through the brush, its bare brick walls, the iron-barred windows. The place was divided into two rooms, a small one for the tanks, and a larger one which I was not allowed to enter. Housing accommodations were in the form of a ramshackle little hut, set apart from the big building at a short distance. It had been a foreman's office during construction at some time in the past, and removal of rusted tools and abandoned gear revealed great gaps in walls and flooring, a sagging roof. Two cheap cots and a small electric stove sufficed for our needs. My first comprehensive view of the whole set-up, with the vast building standing naked in a hard, brassy moonlight, and the miserable shack squatting blackly to one side, made a very unpleasant, even sinister impression.

My premonition had been fulfilled, I reflected, scraping blood from the sole of my shoe. Minute after minute slid by into eternity, and Ammerman lay unbelievably limp and grotesque in the sunshine. Voices roused me, and I squinted back to see the little group approaching the laboratory.

MEMORY, hot and sharp, relieved the fantasy of last night. Another month had been spent there in the hills, with me tending tanks, preparing meals, trucking in the incredible amounts of raw meat that Duvernet ordered. Then a forgotten key in the lab. door gave me an opportunity to appease my natural curiosity. Without any hesitation I turned it, slid the door open and looked in. It was dark, but a switch by the door bathed the place in the brilliant glow of the sodium lamps. At first glance it was just a big, bare room, smelling like the concentrated essence of all the stables in Kentucky. At intervals along the walls were set little nozzles, looking very much like old-fashioned gas-jets. I placed my nose by the nearest; the sickly sweet odor of chloroform hung there and set my head to spinning. On the far side of the room lay a mass of indeterminate grey. As I watched, it began to stir,

take shape. Then my eyes went suddenly into focus again, and I saw it to be a pair of gigantic fishes, perhaps twenty feet long. One of them moved sluggishly around till it faced me, moved jerkily forward on fantastic, spine-like legs, and abruptly launched itself into the air. With pectoral fins outspread like giant wings, and sculling itself with a vast tail, it sailed across the room in a vicious arc, sharklike teeth flashing in a hideous snarl, ravening for my throat.

My heels dug in frantically; I hurled myself headlong in a desperate dive for the door. I made it, hot breath on my neck, and my face ploughing through the gravel outside. One flailing arm slammed the door, and in the next instant the whole building rumbled and shook from the smash of that nightmare bulk against its inner walls.

Blood streaming down one cheek, I staggered up to the tiny grill set into the door, peered through. The entire chamber was filled with an evil-smelling bluish vapor, baffling the eyesight and making all the more terrifying the thumpings, slitherings and bangings that filled the night with sound. I made a dazed way back to the hut, and it was only when I saw Duvernet peering sleepily out the door that I experienced a return of normal emotions.

But I made up for lost time then. I raved; I swore. I shook the Doctor like a rat till his teeth chattered. I was quitting my job then and there. I was going to the police. I'd have the man locked up as a public menace. I'd —While I drew another breath Duvernet began to talk. He was apologetic as only a Frenchman can be, to the extent that I began to be ashamed of being the cause of such abject self-humiliation on his part. He talked of the Great Work, how it had reached its completion. To-morrow was the great day; the newspapermen would be there, prepared to write the lines that would stun the world and give him undying fame. Give *us* undying fame. For naturally without me nothing could have been accomplished.

He began then to give me intimate details of the experiment—how the great pectoral fins had developed, with growth, into winglike surfaces. permitting his pets to "fly" in the manner of flying-fish. How the—but I was glowing now, partly from Duvernet's smooth tongue, partly from several swigs of brandy, which always makes me contented and drowsy. And in the end, of course, I agreed to stick.

That was the night of June 23, 1982 . . . . It was easy to reconstruct events. Ammerman had located us, had hung around like a jilted ghost, filled with bitterness at the fancied injustice and a longing for revenge. Then the forgotten key, a stealthy opening of the door, a sudden upflung hand and cries drowned in the crash of the laboratory doorway as a big body thrust through, a patter of feet, then—oblivion. I shook my head, and for reasons vague and obscure even to myself, decided to contravene justice. It seemed a momentous decision at the time; actually it meant less than nothing at all. I seized the body by the heels, dragged it further up the ravine, and hid it in a pile of dead leaves and rubble.

When I came back to the clearing the newspaper men had gone. Duvernet was seated on the doorstep of the little hut, face buried in his hands. I went up to him, placed a hand on his shoulder.

"It's tough, doc," I said. "I'm sorry."

He sat there without saying anything until I repeated the sentiment. Then he looked up with a blank, vacant expression in his eyes.

"Tough?" he said. "Tough? It's intolerable! To me they cannot do this thing. They do not believe me! They call it a hoax!" His voice began to rise to a thin scream. "They call it a hoax! They brand me a fakir! *Zut!* American swine!"

TO stem the verbal bombardment that seemed imminent, I told him about Ammerman, and how I had hidden the body in the brush. But he didn't register any particular emotion at all, just shaking his head in a dazed way. All his energy had simply been drained out of him by the disaster, his wits befuddled, his enthusiasm crushed. I left him alone.

The evening papers carried a few lines about the "attempted hoax" of Duvernet. The headlines were mostly concerned with a mysterious attack on three people which had occurred just outside of Inglewood. It appeared that some one had run amuck with an ax or heavy-bladed knife, and slashed the victims to ribbons. There were no witnesses. I read the article over twice, killing time, before its full significance burst on me with sudden, icy shock.

In a split second I legged it out of the restaurant where I was waiting to be served, made the car, and drove recklessly back to the lab. Duvernet I found inspecting the wreckage, in a more philosophical state of mind than when I left. Reassured, I showed him the article.

"Doc," I said, when he had finished. "You have probably gone to see Ammerman's body. You recognize the similarity of the two cases. In fact, the newspaper mystery is no mystery at all to us. We know what's responsible for the Inglewood killings. Doc," I was in dead earnest now, "what is this thing you've let loose upon the world? What is going to happen?"

The Frenchman stalled around and tried to dodge the facts, but finally I persuaded him it was his duty to tell the papers again about his experiment in the light of recent developments. He did so, but it was no use. They printed the story this time, but ridiculed it a dozen times in every paragraph. The tune they sang, of course, was the impossibility of crossing genera, the incredibility of the existence of any such creatures as were described by the "crank scientist," and the fact that police attributed the wounds to man-forged weapons.

Duvernet was relieved in a way, though more bitter than ever, but I had a good idea of what was to come. Three days later the papers confirmed my apprehension. Another triple killing, near Culver City. This time there was an eye-witness, who described "two things that looked like balloons with wings" which rose from the mangled bodies and sailed away into the dusk.

From that day on, for three weeks, not a day passed without at least one death. The two monsters and their work filled the front pages of every newspaper in California; photographs and sketches leered at the reader from every edition. The city was in an uproar. Panic-stricken mothers refused to let their children leave the house. Sedate and respectable citizens took to carrying weapons to work. Night traffic dwindled, and scarcely a car was to be seen on the streets after ten. A harassed police force scoured the county for traces of a lair, but without success.

Duvernet was very much distraught over the affair and insisted on remaining in the little hut in the Del Rey hills. I stayed, feeding him almost like a child, as he was much too absorbed in reading every newspaper we could lay hands on to pay attention to the normal routine of living.

"What'll happen to these—Frankenstein monsters of yours?" I asked him once. "This can't go on forever, you know."

Duvernet looked at me with the unmistakable glitter of unbalance in his eyes. He raised one arm toward the heavens. "Male and female He created them," he chanted. "A new race has been born unto—"

I grabbed him by the shoulders and shook sanity back into his head.

"SNAP out of it!" I yelled into his face. "Talk sense."

Duvernet had the grace to look ashamed. "*Zut!* Such a demonstration. I am ill, my big friend. You must forgive . . . . As for my pets, soon they disappear. They spawn. And one day they return, millions strong, to take over the waste spaces of the world for their own."

I thought of Ammerman. "Why confine themselves to waste spaces? So far your creations seem to prefer civilization's comforts exclusively, with a finely developed taste for human flesh."

Duvernet looked pained, shook his head violently. "No-no-no! That is only because they have yet to adapt themselves to a new world. They are frightened. They believe themselves attacked. But soon they become adjusted and, like all wild creatures, will shun the haunts of man." Duvernet was very positive about this. It was his only mistake.

True to the little scientist's predictions, the strange marauding creatures ceased their carnage and vanished entirely within a few days. Weeks passed without further reports and gradually they were forgotten. Men and women resumed their wonted modes of life; all was once more joy and sweetness and light. That is, for everyone but me. Under Duvernet's direction I worked to repair the damaged laboratory, but my heart was not in the job. Every day that passed left me more nervous, jumping at each alien sound, scanning the heavens for signs of the promised return. Every car-ful of happy beachgoers that drove noisily along the near-by road, every group of care-free picnickers, left me in a sweat of apprehension. Finally I could stand it no longer. I went into town and told my story to the editor of one of the largest dailies.

It made good copy, this yarn about a new race that was being born somewhere in the fastnesses of Mexico, or the wastes of the Mojave, or the wilderness of the Cascades, soon to take over the rest of the world by sheer numbers and savagery, and erase mankind from the scroll of evolution. They played it up with headlines and pictures Duvernet and the wrecked lab and plenty of rehash on the old stories about the killings. Reportorial pens dubbed it "The Scourge." But no one took it seriously. People read it, as they read the murder mystery in the Sunday supplements. Like stories of the "next war," it gave them a cheap thrill. Young men set their jaws and enjoyed imagining what they'd do to those flying devils if they dared get within reach. Girls gave ecstatic shudders and squealed in delight as brothers and sweethearts illustrated the most approved methods

of instant annihilation. People everywhere read the story, tossed it aside, and laughed.

But Pierre Duvernet, though it was a bitter one indeed, had the last laugh. For upon October 21, 1982, the California sun dawned upon a world gone mad.

At 4:57 A.M. the air mail from Albuquerque arrived, with the pilot reporting a curious phenomenon toward the south. "Visibility was poor," he said, "but it looked to me like a vast, thin cloud bank, or a rough metallic shield, moving rapidly northward, stretching backward to infinity." The pilot was much given to flowery diction.

At 5:45 the extraordinary appearance of the southeastern sky was easily observable by early risers in the city. Rumors of typhoon circulated, ridiculously and tragically enough, and brought the populace outdoors in full force to watch. A large mob gathered in Greater Pershing Square. By seven it was clear that here was something far different from any storm or ordinary manifestation of nature. The sound sibilant and disturbing, as of wind whistling through a myriad tiny wires, drifted in to the silent, watching multitudes. Observers with field glasses began to pick out individual shapes. "Air maneuver" was the next word that went round. Then abruptly, as the sun shone clear for the first time, through the loudspeaker system someone shrilled in stark fear:

"It's them things! Them flying sharks! It's the Scourge!"

With the sudden ruthlessness of the hammers of Thor, Duvernet's monsters, a million strong, swept down upon a helpless metropolis and ravaged it from end to end. For seven incredible, bloodfilled days that devil's brood hung over the city, until the thickness of their bodies and the clouds of nauseous blue gas they ejected, literally blotted out the sun. Beneath that murky curtain thousands upon thousands of helpless men and women were struck down, battered and mangled with terrible ferocity. Guns roared, pain- and terror-filled shrieks mingled with the groans of the dying, with the crash of glass and rending of wood as temporary havens gave way before the assault, with the thin screen of air cleaved by giant fins in a swoop of death.

FANTASTIC scenes, of heroism and cowardice and cunning and sheer madness, were enacted every minute as frantic fathers and husbands strove to get their loved ones to the only safe shelter afforded by the concrete walls of downtown buildings. Men argued in the streets, cogently pointing out that hybrids cannot reproduce themselves, and even if they could, acquired characteristics cannot be inherited, then were annihilated on the spot by the very creatures they proved could not exist. Attempts were made to fight back, of course. Scarcely a weapon in the entire city failed to see service in those panic-stricken days. The tough scales on the attackers formed such an armor-plating, however, that lead slugs spattered harmlessly off. Steel-jacketed bullets were used, but only the heaviest calibre rifles made an appreciable impression. Daring aviators rolled out their planes, guns loaded with explosive shells. But these tended to go off before sufficient penetration, and the most brilliant maneuvering proved unavailing against a hundred thousand opponents. For the big fish seemed to sense a real danger in the airplanes, attacking relentlessly on sight, in-

variably sending them down shattered and broken.

Hundreds of the weird monstrosities were blown to bits by high explosives; others were destroyed by the big coast-defense guns near the harbor. Spray-guns, built to contain powerful corrosives, did some damage. But these triumphs were negligible. Poison gas was tried, but the more volatile gases dispersed too quickly, while the heavier types did far greater harm to the unprotected populace than to the enemy. The harassed military leaders were at their wits' end, while the hysterical, crazed city sent appeal after frantic appeal to a stupefied and helpless Washington.

It was as if some curious hiatus in time had permitted two disparate ages to coincide, loosing a flood of Mesozoic monsters upon an unbelieving world.

Then, inexplicably, at the end of the seventh day the scavenging horde took unanimous flight and vanished in the darkening sky to the north. A stiff wind from the sea that night swept away the traces of gas, and the sun, on the morning of October 28, looked upon a scene of appalling desolation. From our isolated and comparatively safe retreat in the old laboratory, Duvernet and I could see it well. The countryside, toward the city as far as the eye could reach, was littered with dead bodies, both piscine and human. Save the vultures that were already plying their ghastly trade, no living thing stirred in all that expanse.

With more nerve than sense I rolled out the car and drove into town, more than once being forced into the ditch to go around stalled cars, wrecks, or the grim relics of someone's last fight for life against overwhelming odds. In town the streets were literally piled high with the dead. Occasional gusts of wind carried the overpowering stench of corruption. Looting was going on in a surreptitious manner, most of the people walking about in a dazed, half-conscious fashion. They acted shell-shocked. I slipped into a ruined and deserted electrical shop and took a small magna-radio, then got out of that tomb of the damned as fast as I dared drive.

When I returned to the lab, Duvernet had locked himself in. I was afraid he intended something rash at first, and yelled through the windows till he responded. He came running to the door.

"Zut!" he piped, very excited. "I carry out the experiments of greatest importance and you dare to interrupt. Take yourself away at once! Go!" He waved his arms like a windmill in my face.

I must have looked hurt or chagrined then, for he suddenly softened.

"Ah, my big friend. I understand. It is for me you have the worry, no? But see, everything arranges itself nicely. So allow me to have peace and quiet, please. While I work out the salvation of mankind."

That was the old Duvernet talking, hands and egotism working overtime, so I left him, satisfied that he was mentally well again. To kill time while the Doctor idly amused himself in the lab (so I thought) I set up the magna-radio and listened to news reports from all over the country. Bit by bit I heard the terror-story that is now engraved in living fire on the hearts of nearly every man and woman in America.

The "Scourge" had swept up the coast and struck San Francisco, then had moved further north laying waste all towns and cities in their path.

Then they turned inland and with the destructive swiftness of a plague worked their bloody way across the entire country. Weeks passed, months, and the toll of death and property loss mounted steadily. At regular intervals new hordes made their appearance to join the main body of the destroyers. These newcomers, of course, were newly-spawned "fingerlings," a good deal smaller at first than Duvernet's original pair, but none the less lethal for all that.

Lung infections and diseases began to show alarming increase. They were traced to the ill-smelling blue gas ejected by the invaders which, though not dangerously poisonous, was irritating to lung tissues and weakened resistance. And signs were already pointing to famine and pestilence about to sweep the land.

A CURIOUS, ironic twist to the whole business gradually made itself apparent. The strange creatures were very much averse to large bodies of water. Shipping on ocean or large lakes was not bothered; island inhabitants were never molested. When this was first noted, a great war-scare swept over the country, the invasion being attributed to the malignant genius of the Russians, or the Japanese, or of almost anyone who might have had it in for the terrorized nation. The scare fizzled, however, under the stress of fighting for life and died altogether when it was learned that, in spite of rigid embargo, somehow a few eggs from the monsters found their way into the Orient and gave birth to another horde of devouring devils, reducing the Far East to a gibbering madhouse.

Los Angeles suffered two more brief visitations, and after the second I thought it safe to go into town for supplies. I reached the city after dark, and it was like stepping into a circle of Dante's *Inferno*. The power plants had been wrecked, so there were no electric lights of any kind. A view of the city from any vantage point presented a series of lurid friezes, lighted by the hellish glow of open fires and torchlight, ringed by reddened puppets bouncing and gesturing in strange pantomime. The city was in the throes of a great religious renascence. Wild eyed preachers declared the new monsters to be a divine purge visited upon a sinful world. Multitudes were bade to make themselves ready for the Day of Judgment. The end of the world was at hand; a long-suffering Lord was about to rise in His wrath and strike down an impious peoples. Still other fanatics classed Duvernet as a latter-day Moses, who "stretched forth his hand toward heaven; and there was a thick darkness in all the land . . ." And thousands of avid listeners, become as frenzied as wild revivalists, shouted and wept and prayed.

In another part of the city, nearer what had been the heart of town, I found more practical-minded groups marching down the streets, burning Duvernet in effigy. The Frenchman was reviled in blistering terms by a savage mob who cheered every time another straw figure, dressed in top-hat and morning-coat, went up in flames. There was plenty of talk about finding the real Duvernet and making a nice big torch of him, too. I feared recognition, so without delay I slipped away from town and headed back for the lab.

Duvernet was still at work, and I burst in on him without ceremony. He looked up at me, eyes shining.

"I have it," he said pantingly, tensely. "I have it at last. We shall

destroy our destroyers. Civilization shall be preserved."

I stared at him; there was no mistaking his sincerity. I looked around, searching vaguely, I guess, for some sort of weapon, or death-ray. But there was none. The aquarium tanks were almost depopulated. Rotting fish lay strewn carelessly over the floor. On the table several microscopes were set up, and a number of what looked like bacteria cultures were lined up in one corner, artificially warmed. The place stank. Duvernet chuckled, reading my thought.

"No, no, my big friend. There is nothing of the infernal machine in our work. The defense for what was created up here," he tapped his head with a stained finger, "is to be found only in the same place."

He swept his arm around in a short gesture. "Behold here the smallest, sublest, and most deadly of all weapons. I have experimented with a most virulent type of Myxosporidia, one of the Sporozoa. Even in its milder manifestations, it results in serious epidemics among fish. In the deadly form I have here, well—! Look. I have injected a solution into some of our specimens here. Within twenty-four hours the minute spores were found in all the organs. Deep ulcers appeared on the fish and extended into the internal organs, and the fish succumbed. When we spread this among our winged persecutors, in a month, in three weeks, pouf! they shall be swept from the heavens." He grinned smugly.

That reminded me. I grabbed his arm. "Listen, Doc. I'm just back from town, and things don't look so well. The people are pretty sore at you right now, and if they ever find this place . . . . Well, it'd just be too bad. I think we ought to be ready to pull out of here at a moment's notice."

Duvernet lifted his arm, then left it hanging there in the air, rigid, as someone pounded on the door. We looked at each other without saying anything. I walked across to the door, opened it, and stepped out into a crowd of five hundred blood-lusting men. I had been seen after all and followed. For a minute the silence was absolute, painful, stuffing the ears like high altitudes. Then,

"Well?" I said, for the lack of anything better.

The leader leered up into my face. "We know Duvernet is in that lab, Clark, so it won't help to stall. We're going to get him. But we ain't got anything against you. You're just an ignorant tool of his; we don't want to hurt you particularly. So if you're wise you'll drift away while you're able. As I say, we don't *want* to hurt you, but we won't *mind* doin' it if it's necessary to get Duvernet."

I thought again of Ammerman, struck down without even a fighting chance. But even more I thought of that indomitable little Frenchman, going without food, without sleep, day after day and night after night, struggling to save a people who sought to strike him down in a blind fury of revenge. So I said, "Come and take him, then," and sledged my fist into the fellow's face.

It was a great scrap while it lasted. I had partial protection by remaining in the doorway, as the building's walls projected almost a foot beyond the door. No more than two or three could get to me at one time, and they hampered each other. While all I had to do was brace myself against the door and pump in both hands as fast and as hard as I could. I did plenty of damage. Every blow found its mark on jaw or head. Blood spurted; men

shouted and cursed and groaned and went down to be trampled upon by their neighbors. It was only a matter of time, however, until the very weight of their numbers pinned me helpless to the door. They pushed in unison, hinges creaked, I gasped, and suddenly the door and I and part of the mob burst into the lab with a crash.

Moments passed, pregnant with unsaid possibilities. Duvernet stood quietly before his bench and looked at the ring of bloodshot eyes. Then, with a great sense of the dramatic, he made a little bow and said simply:

"Thank you, my friends. You are here just in time. I need you."

QUIETLY, yet with something very compelling in his voice, he went on to explain the situation he had just outlined to me, how he had his weapons all ready to shoot at the enemy, and needed only an army to help him launch his attack. His great problem was to find a quantity of newly-laid eggs, so that he could inject his embryo epidemic into the young fish without danger. Without these eggs he was helpless. And he thanked a benevolent God who put ready-made into his hands a sort of expeditionary force to help him in his time of need. In less than ten minutes, having directed their pent-up energies into safer channels, Duvernet had that mob, soul and body, his own.

From then on, things moved on oiled wheels. Directed by the Doctor and myself, our "army of deliverance" scoured the countryside for deposits of the huge eggs. By truck, by wagon, by wheelbarrow, by hand they poured into the laboratory, to be piled into crude incubators. Work was facilitated by the unbelievable speed with which the young fish developed. I swear that by careful observation one could actually see the things grow, as in a slow-motion picture. Forty-eight hours saw them sufficiently large to inflict serious injuries. At that stage Duvernet passed out hypodermics and containers of spore-bearing solutions to a corps of assistants, who made their deadly injections, and the messengers of death were released.

Several of the men were radio technicians, and they managed to rig up a short-wave broadcasting magnaradio, over which details of the work in progress were sent to all parts of the country, and to the Orient. Scientists everywhere began to duplicate Duvernet's experiments.

At the end of the fifth day Duvernet collapsed on the laboratory floor from starvation and sheer exhaustion, and all work came to a halt. We were all badly played out and glad of the rest, so the remainder of our eggs were destroyed and we gathered round the radio for the news reports that came in at spasmodic intervals. A day passed, two, three. Then one morning an excited voice announced that the Scourge was dropping from the skies above Atlanta by thousands, as if stricken in mid-flight by some invisible force. Other enthusiastic reports came over the air from all parts of the country, blending in a veritable paean of exultation. Hour by hour the monsters were being wiped from the skies, literally raining their huge bodies over mountain, plain, and desert. And within three weeks to the dot, the Scourge of '82 was no more.

The revilement and vilification that had been cast upon the name of Duvernet was as a whisper on a desert isle compared to the world-wide acclaim and adulation heaped on the little Frenchman by a race hysterical-

ly grateful for his deliverance. Ride after triumphal ride was made down the main streets of every important city in America, with crowds roaring cheers and eulogy in his ears every inch of the way. Newspapermen, ignoring or scrambling mythology, hailed him as Prometheus, bringer of light to a shadowed world. The parade in New York made the half-century-old Lindbergh reception look like a rehearsal, with tons of ticker-tape and confetti literally snowing the pavements under, and millions of frantic admirers screaming their throats raw and fighting to get just a glimpse of the savior.

Duvernet, of course, simply reveled in it. It was his element. Hand-shaking and gift-accepting and baby-kissing came as naturally and gracefully to him as if he had done it all his life. Everything, from the tiniest trinkets to a million-dollar trust fund offered by a well-known philanthropist, he accepted with the effusive graciousness of the French, and sent the donors away singing his praises to the skies. For a short space of time, there was nothing within the power of the American people to give that he could not have had for the asking. The Chinese, too, heaped oriental honors upon his head. The King of England acknowledged his great work in the preservation of Canada.

I didn't do so badly myself. There were plenty who remembered my small part in the great drama, and who insisted upon showing appreciation. One way and another, basking in Duvernet's reflected glory, I found myself pretty well fixed before it was over.

The edge of this demonstration, of course, gradually wore off. Men and women returned to take up the normal burden of their lives. But Duvernet remained the greatest of all figures in the hearts of the people. He and I settled down in a beautiful mansion in Beverly Hills, but there was no peace, to real seclusion even then. Scientific journals hung on his every word; newspapermen, newsreel men, and photographers pestered him almost daily for interviews and pictures; would-be biographers slunk about the grounds like wild dogs, ears sticking out, on the alert for the slightest scrap of information.

AND from the very midst of this fairy-tale existence, came the news flash that stunned the nation—Doctor Duvernet was dead, the victim of an accident in his own home. The American people, to a man, went into three days' mourning, by proclamation of the President. Business, pleasure, almost life itself came to a pause while the world paid tribute to a great man. Out-of-door services were held in down-town Los Angeles, and millions of grief-stricken men and women packed the great square and jammed the near-by buildings. Construction was begun immediately on a gigantic monument to his memory, eventually to rise five hundred feet into the air, crowned by a statue of Prometheus, with the features of Duvernet, throwing off his chains and reaching out with one hand toward the sun. It was symbolic of the search of Duvernet, and all mankind, for intellectual light.

Little mention was made of the accident. I simply made the statement to the press that I had found the body at the foot of the narrow and dangerous spiral iron stairway, that led to the upper floors in the back part of the house. The neck was broken. No one had witnessed the fall. But there was more to it than that.

Shortly after noon, I had gone upstairs to see if Duvernet wanted lunch. He had, of course, turned the whole third floor into a laboratory and spent most of his waking hours there. Just as I topped the stairs, he popped out of the lab. and rushed at me characteristically with a stream of excited language. He had discovered a rare species of tropical insect whose main defense mechanism consisted in the release of noxious fumes at an attacker. Duvernet claimed to have had results in isolating a hormone related to growth control. The fumes themselves were actually poisonous in a mild way, and there was no telling how deadly they might become with added volume. For no apparent reason, the Doctor was determined to carry out another experiment along the lines of his now-famous first one, though this time all precautions would be taken . . . . He went on, while familiar little red lights played tricks deep in his eyes.

I looked at the doughty little Frenchman whom I loved so much in my clumsy way, but my mind fled to the part. I remembered, despite "precautions," a world of half-darkness with the stench of slaughtered thousands hanging heavy in the air. I remembered children torn screaming from their mothers' arms and slashed to ribbons in the streets. I remembered a terror-haunted nation skulking in cellars and caves, afraid for their very lives if they dared step out to search for food. Even more I remembered Ammerman, my friend, raped of life with youth's bloom still on his cheeks. And I thought: this man Duvernet has drunk deep of everything life has to offer. He has lived completely, to the full. Whatever he does from this day henceforth cannot help but leave the sour taste of anti-climax in his mouth. Life has nothing more for him.

I looked at Duvernet again and smiled, and saw the startled intelligence leap into his eyes. A band constricted around my throat. He started to resist, one hand on the low, flimsy railing by the stairhead, then relaxed with a little gesture of surrender. And I like to think, though my sight was suddenly misty with something hot that filled my eyes and overflowed, burning, down my cheeks, that Duvernet's last earthly smile for me was an understanding and a forgiving one.

I pushed him over.

THE END

Cities of Tomorrow

The city of tomorrow, engineers say, will tend first to vastness; gigantic buildings connected by wide, suspended roadways on which traffic will speed at unheard of rates. This is the city the artist has pictured here. Traffic handled in huge underground tunnels, aerial ways, and in the air itself. Helicopter planes, capable of maneuvering about between buildings and roof-top airports, will take the place of the ground taxi. Each building will be virtually a city in itself, completely self-sustaining, receiving its supplies from great merchandise ways far below the ground. Dwellers and workers in these buildings may go weeks without setting foot on the ground, or the ground-level. In this city smoke will be eliminated, noise will be conquered, and impurity will be eliminated from the air. Many persons will live in the healthy atmosphere of the building tops, while others will commute to far distant residential towns, or country homes.