

# ASTOUNDING

DEC. '41

SCIENCE-FICTION

A STREET & SMITH PUBLICATION

SECOND STAGE LENSMEN

by E. E. SMITH, Ph. D.

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# ASTOUNDING

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## COVER BY ROGERS

All stories in this magazine are fiction. No actual persons are designated either by name or character. Any similarity is coincidental.

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# EXPANSION

ASTOUNDING SCIENCE-FICTION is going to start the year 1942 with a real and major improvement. The January, 1942, issue of Astounding will be the first of a new, large-size Astounding—the same size in shape, area, and thickness as the recently enlarged *Unknown Worlds*.

That will be the first major physical change in Astounding since its inception exactly a dozen years ago, when its first, January, 1930, issue appeared on the stands. It's been some years since Astounding started the trend toward trimmed edges; changes in the magazine have been made only after we were convinced that it was an improvement of genuine merit.

In some ways, it might have been interesting to wait another month to start the change—since the February, 1942, issue of Astounding will be the 100th consecutive monthly issue. A record, incidentally, in the somewhat fluid field of science-fiction. Instead, however, we're going to start the new year with the new form.

The magazine will be almost exactly the size of a standard sheet of typewriter paper, with a good, firm thickness of 128 pages. Paper for the larger, flatter magazine must be somewhat tougher, so it will bulk a bit thicker than 128 of our present pages.

## COVERS

Hubert Rogers has done the cover for the January issue—it will be a typical Rogers cover. We intend to continue with the science-fiction cover, rather than the plain type cover as is used on the large *Unknown Worlds*.

We may, later, change the design of the cover somewhat, but for the first large-size issue no change, except for a wider border around the picture, is contemplated; we want our regular readers to be able to recognize it at a glance, naturally.

## QUANTITY AND QUALITY

The increase in size is greater, actually, than one would think. The reduction in number of pages from our present 160 to 128 might seem to offset the increase in page area. I—and the authors—can assure you it does not. The new Astounding will carry nearly half again as much material. The current installment of E. E. Smith's great "Second Stage Lensmen" is distinctly a long item—but it is shorter than the *added* space available in the January issue. The new magazine will be able to carry a com-



plete 35,000-word short novel *in addition* to all the material now appearing in the magazine.

We plan to use such stories as would now appear as two, or even three-part serials as complete short novels. Long stories which now represent four-part stories will reach you with only a one-month interval.

Further, because science-fiction must—unlike here-and-now stories—build up a complete background of the world the author is describing in addition to telling the stories, novelettes have always been essentially a better medium. The added room has given the author the time and space to build up that background and present his story in the most effective manner. But novelettes have represented so considerable a length as to be self-limiting in number. The new large size will permit us to use many more novelettes in each issue.

Authors like novelettes—and readers always have shown a preference for them. Now it will be entirely practicable to run a long 35,000-word novella, a 20,000-word novelette, two 15,000-word novelettes, and several short stories of 5,000 to 8,500 words in each issue, together with articles and Brass Tacks. That means we'll be able to offer not only more material, but better developed material. (Authors will also like the change because it means we'll be increasing author income by several hundred dollars a month!)

### MONTHLY ISSUE

The magazine will, of course, continue to appear every month, on the third Friday—in this case, the first of the large size appears December 19th; the second on January 16th.

That larger size costs considerably more to produce—witness the increase in author payments—in nearly all departments. It does not cost much more to distribute it, however—wherein you'll get more of a bargain. The price goes up five cents a copy—the magazine goes up fifty percent in content, and, I suspect, one hundred percent in enjoyability due both to increase in content and particularly in the better development possible to story ideas.

The line-up for January issue includes not only E. E. Smith, but Jack Williamson, L. Ron Hubbard, Eric Frank Russell, Norman L. Knight, and others. It's going to be a really big issue in more ways than one.

Incidentally—a hint to the wise: beginning *next* month, subscriptions will naturally rise in cost, too. They'll be \$2.50 hereafter, not the \$2.00 a year they are now. Subscriptions for several years can be taken. And the January number will be mailed out just a little less than a week before Christmas—

THE EDITOR.





# SECOND STAGE LENS MEN

by E. E. Smith, Ph. D.

**SECOND OF FOUR PARTS.** Continuing the sequel to "Galactic Patrol" and "Gray Lensman"—**"Skylark" Smith's newest and strongest novel!**

Illustrated by Rogers

*When the inertialess drive was perfected and commerce throughout the Galaxy became commonplace, crime became so rampant as to threaten Civilization. Then came into being the Galactic Patrol, an or-*

*ganization whose highest members, the Lensmen, are of unlimited authority and range. Each is identified by his Lens, a pseudoliving, telepathic jewel matched to the ego of its owner by the Arisians, a race*



of beings of unthinkable age and of immense power of mind. The Lens cannot be counterfeited, since it glows with color when its owner wears it and kills any other who attempts to do so.

Of all the eighteen-year-olds of Earth, only about a hundred win through the five-year period of elimination and become Lensmen. Kimball Kinnison graduates Number One in his class and sets out to capture one of the new-type ships of the "pirates"—in reality Boskonians, adherents to a culture even more widely spread than Civilization. He succeeds, but with Van Buskirk, a Valerian, is compelled to take to a lifeboat.

They land upon Velantia and aid Worsel, a scientist, in overcoming the Overlords, a horribly parasitic race of Delgon, a neighboring planet. En route to Earth they land upon Trengo, the planet upon which is produced thionite, the deadliest of all habit-forming drugs.

He searches for Grand Base, Boskonian's galactic headquarters. He is seriously wounded, and in Base Hospital is cared for by Nurse Clarrissa MacDougall. Surgeon General Lacy and Port Admiral Haynes promote a romance between nurse and Lensman. Kinnison goes to Arisia for advanced mental training, acquiring the sense of perception and the ability to control the minds of others. He investigates Grand Base, finding it impregnable to direct attack. He obtains a vast supply of thionite from Trengo. He gets into Grand Base and floods the air with thionite, thus wiping out all the personnel except Helmuth, the Boskonian commander. He kills Helmuth in hand-to-hand combat. The Patrol attacks and Grand Base falls.

He discovers that Boskone's supreme command is in the Second Galaxy, and decides that the best way to get a line upon it is to work upward through the drug syndicate. Disguised as a dock walloper, he frequents the saloon of Bominger, the drug baron of the planet Radelix, and helps raid it. He calls a Conference of Scientists, which devises the means of building a bomb of negative matter. Strongheart, the next-in-line above Bominger, he investigates as Wild Bill Williams, meteor miner, of Aldebaran II, after having become a heavy drinker and a drug addict. From Strongheart's mind he learns that his next objective is Crowninshield of Tressilia III, the operator of a very high class pleasure palace.

Boskone forms an alliance with the Overlords of Delgon and, through a hyperspatial

tube, they attack humanity. But Kinnison and the Dauntless, one of the Patrol's finest ships, go down the tube and blast the installation.

In order to investigate Crowninshield logically, Wild Bill Williams strikes it rich in the meteor belts and becomes William Williams, Aldebaranian gentleman—he having been a gentleman once. From Crowninshield he gets a line upon Jalte, one of the Galactic Directors, whose stronghold is in a star cluster just outside the First Galaxy. He goes there, and learns that Jalte does take orders from Boskone; which is not a single entity, but a Council of Nine of the Eich, a monstrous race inhabiting the planet Jarnevon.

He and Worsel go there on a scouting expedition. Kinnison gets into the stronghold, but is blinded and tortured. Worsel helps him escape and they get back to Prime Base. Kinnison's hands and feet have to be amputated, but Phillips, a Posenian surgeon who has finally finished his researches in neurology and hormones, causes new limbs and eyes to grow in place of the lost members.

Kinnison and "Mac," now sector chief nurse, acknowledge their love, but admit that the job comes first. The Patrol's Grand Fleet is assembled and, with Kinnison in charge of Fleet Operations, invades the Second Galaxy. Jalte's planet is consumed by a negative-matter bomb, the enemy fleet is wiped out in combat in intergalactic space, and Jarnevon, Boskone's home planet, is crushed between two colliding planets.

Shortly after the return to Tellus, however, it becomes apparent, from the continuation of Boskonian activities, that Boskone was not in fact the supreme headquarters of the "zwilniks." Kinnison suspects that a counterattack may be made upon Tellus by means of a hyperspatial tube, and precautions are taken. Such an attack is made. The Boskonian fleet is destroyed, the invading planets made helpless by the "sunbeam"—a concentration of all the energy of the sun into the mouth of the tube.

In searching for new leads to follow, Kinnison finds traces of enemy work done by a mind of such power as to leave almost no traces. He manages to put a tracer ray upon the zwilnik's ship and follows it in the Dauntless out to one of the unexplored spiral arms of the Galaxy, to Lyrane II, in Dunstan's Region. This planet is inhabited by human-appearing matriarchs,



• who kill all strange males on sight, usually by sheer power of mind. They had so killed a party of visiting zwilniks, and it was in the Boskonian ship, together with Illona Potter, the only woman on board, that the Chief Person of Lyrane—nicknamed Helen of Troy by Kinnison—had gone to Tellus and aroused the Lensman's suspicions.

The matriarchs cannot kill Kinnison, and, without killing any of them, he takes Illona away from them and starts back for Tellus. He finds that the girl, originally from Aldebaran II, is not a hardened Boskonian agent, but a youngster who converts herself to Civilization's side and who is a valuable source of information. Menjo Bleeko is the dictator of her planet, Lonabar—a planet unknown to any scientist of Civilization. Helen of Lyrane II sends a thought, saying that the planet is being invaded by two zwilnik ships and asking his help.

The *Dauntless* turns back toward Lyrane II and the Boskonian raiders.

## VI.

As the *Dauntless* approached Lyrane II so nearly that the planet showed a perceptible disk upon the plates, the observers began to study their detectors carefully. Nothing registered, and a brief interchange of thoughts with the Chief Person of Lyrane informed the Lensman that the two Boskonian warships were still upon the ground. Indeed, they were going to stay upon the ground until after the hundred Lyranian leaders, most of whom were still safely hidden, had been found and executed, exactly as per announcement. The strangers had killed many persons by torture and were killing more in attempts to make them reveal the hiding places of the leaders, but little if any real information was being obtained.

"Good technique, perhaps, from a bullheaded, dictatorial standpoint, but it strikes me as being damned poor tactics," grunted Malcolm Craig, the *Dauntless'* grizzled cap-

tain, when Kinnison had relayed the information.

"I'll say it's poor tactics," the Lensman agreed. "If Helmuth or one of the living military hot shots of his caliber were down there, one of those cans would be out on guard, flitting all over space."

"But how could they be expecting trouble 'way out here, nine thousand parsecs from anywhere?" argued Chatway, the chief firing officer.

"They ought to be—that's the point." This from Henderson. "Where do we land, Kim? Did you find out?"

"Not exactly; they're on the other side of the planet from here, now. Good thing we don't have to get rid of a Tellurian intrinsic this time—it'll be a near thing as it is." And it was. Scarcely was the intrinsic velocity matched to that of the planet when the observers reported that the airport upon which the enemy lay was upon the horizon. Inertialess, the *Dauntless* flashed away, going inert and into action simultaneously when within range of the zwilnik ships. Within range of one of them, that is; for, short as the time had been, the crew of one of the Boskonian vessels had been sufficiently alert to get her away. The other one did not move; then or ever.

The Patrolmen acted with the flawless smoothness of long practice and perfect teamwork. At the first sign of zwilnik activity as revealed by his spy rays, Nelson, the chief communications officer, loosed a barrage of ethereal and subethereal static interference through which no communications beam or signal could be driven. Captain Craig barked a word into his microphone and every dreadful primary that could be brought to bear erupted as one weapon. Chief Pilot Henderson,



after a casual glance below, cut in the Bergenholms, tramped in his blasts, and set the cruiser's narrow nose into his tracer's line. One glance was enough. He needed no orders as to what to do next. It would have been apparent to almost anyone, even to one of the persons of Lyrane, that that riddled, slashed, three-quarters fused mass of junk never again would be or could contain aught of menace. The Patrol ship had not stopped: had scarcely even paused. Now, having destroyed half of the opposition *en passant*, she legged it after the remaining half.

"Now what, Kim?" asked Captain Craig. "We can't inglobe him and he no doubt mounts tractor shears. We'll have to use the new tractor zone, won't we?"

Ordinarily the gray-haired four-striper would have made his own decisions, since he and he alone fought his ship; but these circumstances were far from ordinary. First, any Unattached Lensman, wherever he was, was the boss. Second, the tractor zone was new; so brand-new that even the *Dauntless* had not as yet used it. Third, the ship was on detached duty, assigned directly to Kinnison to do with as he willed. Fourth, said Kinnison was high in the confidence of the Galactic Council and would know whether or not the present situation justified the use of the new mechanism.

"If he can cut a tractor, yes," the Lensman agreed. "Only one ship. He can't get away and he can't communicate—safe enough. Go to it."

THE Tellurian ship was faster than the Boskonian; and, since she had been only seconds behind at the start, she came within striking distance of her quarry in short order. Tractor

beams reached out and seized; but only momentarily did they hold. At the first pull they were cut cleanly away. No one was surprised; it had been taken for granted that all Boskonian ships would by this time have been equipped with tractor shears.

These shears had been developed originally by the scientists of the Patrol. Immediately following that invention, looking forward to the time when Boskone would have acquired it, those same scientists set themselves to the task of working out something which would be just as good as a tractor beam for combat purposes, but which could not be cut. They got it finally—a globular shell of force, very much like a meteorite screen except double in phase. That is, it was completely impervious to matter moving in either direction, instead of only to that moving inwardly. Even if exact data as to generation, gauging, distance, and control of this weapon were available—which they very definitely are not—it would serve no good end to detail them here. Suffice it to say that the *Dauntless* mounted tractor zones, and had ample power to hold them.

Closer up the Patrol ship blasted. The zone snapped on, well beyond the Boskonian, and tightened. Henderson cut the Bergenholms. Captain Craig snapped out orders and Chief Firing Officer Chatway and his boys did their stuff.

Defensive screens full out, the pirate stayed free and tried to run. No soap. She merely slid around upon the frictionless inner surface of the zone. She rolled and she spun. Then she went inert and rammed. Still no soap. She struck the zone and bounced; bounced with all of her mass and against all the power of her driving thrust. The impact jarred the *Dauntless* to her very skin;



but the zone's anchorage had been computed and installed by top-flight engineers and they held. And the zone itself held. It yielded a bit, but it did not fail and the shear planes of the pirates could not cut it.

Then, no other course being possible, the Boskonians fought. Of course, theoretically, surrender was possible, but it simply was not done. No pirate ship ever had surrendered to a Patrol force, however large; none ever would. No Patrol ship had ever surrendered to Boskone—or would. That was the unwritten but grimly understood code of this internecine conflict between two galaxy-wide and diametrically opposed cultures; it was and had to be a war of utter and complete extermination. Individuals or small groups might be captured bodily; but no ship, no individual, even, ever, under any conditions, surrendered. The fight was—always and everywhere—to the death.

So this one was. The enemy was well armed of her type, but her type simply did not carry projectors of sufficient power to break down the *Dauntless*' hard-held defensive screens. Nor did she mount screens heavy enough to withstand for long the furious assault of the Patrol ship's terrific primaries.

As soon as the pirate's screens went down the firing stopped; that order had been given long since. Kinnison wanted information, he wanted charts, he wanted a few living Boskonians. He got nothing. Not a man remained alive aboard the riddled hulk; the chart room contained only heaps of fused ash. Everything which might have been of use to the Patrol had been destroyed, either by the Patrol's own beams or by the pirates themselves after they saw they must lose.

"Beam it out," Craig ordered, and

the remains of the Boskonian warship disappeared.

BACK toward Lyrane II, then, the *Dauntless* went, and Kinnison again made contact with Helen, the Elder Sister. She had emerged from her crypt and was directing affairs from her—"office" is perhaps the word—upon the top floor of the city's largest building. The search for the Lyranian leaders, the torture and murder of the citizens, and the destruction of the city had stopped, all at once, when the grounded Boskonian cruiser had been blasted out of commission. The directing intelligences of the raiders had remained, it developed, within the "safe" confines of their vessel's walls; and when they ceased directing, their minions in the actual theater of operations ceased operating. They had been grouped uncertainly in an open square, but at the first glimpse of the returning *Dauntless* they had dashed into the nearest large building, each man seizing one or sometimes two persons as he went. They were now inside, erecting defenses and very evidently intending to use the Lyranians both as hostages and as shields.

Motionless now, directly over the city, Kinnison and his officers studied through their spy rays the number, armament, and disposition of the enemy force. There were one hundred and thirty of them, human to about six places. They were armed with the usual portable weapons carried by such parties.

Originally they had had several semiportable projectors, but since all heavy stuff must be powered from the mother ship, it had been abandoned long since. Surprisingly, though, they wore full armor. Kinnison had expected only thought screens, since the Lyranians had no offensive weapons save those of the



mind; but apparently either the pirates did not know that or else were guarding against surprise.

Armor was—and is—heavy, cumbersome, a handicap to fast action, and a nuisance generally; hence for the Boskonians to have dispensed with it would not have been poor tactics. True, the Patrol *did* attack, but that could not have been what was expected. In fact, had such an attack been in the cards, that Boskonian punitive party would not have been on the ground at all. It was equally true that canny old Helmuth, who took nothing whatever for granted, would have had his men in armor. However, he would have guarded much more completely against surprise—but few commanders indeed went to such lengths of precaution as Helmuth did. Thus Kinnison pondered.

"This ought to be as easy as shooting fish down a well—but you'd better put out space scouts just the same," he decided, as he punched a call for Lieutenant Peter van Buskirk. "Bus? Do you see what we see?"

"Uh-huh, we've been peeking a bit," the huge Dutch-Valerian responded, happily.

"QX. Get your gang wrapped up in their tinware. I'll see you at the main lower stabbard lock in ten minutes." He switched off and turned to an orderly. "Break out my G-P cage for me, will you, Spike? And I'll want the 'copters—tell them to get hot."

"But listen, Kim!" and:

"You can't do that, Kinnison!" came simultaneously from chief pilot and captain, neither of whom could leave the ship in such circumstances as these. They, the vessel's two top officers, were bound to her; while the Lensman, although ranking both of them, even aboard ship, was not and

could not be bound by anything.

"Sure, I can—you fellows are just jealous, that's all," Kinnison retorted, cheerfully. "I not only can, I've got to go with the Valerians. I need a lot of information, and I can't read a dead man's brain—yet."

WHILE the storming party was assembling, the *Dauntless* settled downward, coming to rest in the already devastated section of the town, as close as possible to the building in which the Boskonians had taken refuge.

One hundred and two men disembarked: Kinnison, Van Buskirk, and the full company of one hundred Valerians. Each of those space-fighting wild cats measured seventy-eight inches or more from sole to crown; each was composed of four hundred or more pounds of the fantastically powerful, rigid, and reactive brawn, bone, and sinew necessary for survival upon a planet having a surface gravity almost three times that of small, feeble Terra.

Because of the women held captive by the pirates, the Valerians carried no machine rifles, no semiportables, no heavy stuff at all; only their de Lameters and, of course, their space axes. A Valerian trooper without his space ax? Unthinkable! A dire weapon indeed, the space ax. A combination and sublimation of battle-ax, mace, bludgeon, and lumberman's picaroon; thirty pounds of hard, tough, space-tempered alloy; a weapon of potentialities limited only by the physical strength and bodily agility of its wielder. And Van Buskirk's Valerians had both—plenty of both. One-handed, with simple flicks of his incredible wrist, the smallest Valerian of the *Dauntless* boarding party could manipulate his atrocious weapon as effortlessly as, and almost unbelievably faster than,



a fencing master handles his rapier or an orchestra conductor waves his baton.

With machinelike precision the Valerians fell in and strode away; Van Buskirk in the lead, the helicopters hovering overhead, the Gray Lensman bringing up the rear. Tall and heavy, strong and agile as he was—for a Tellurian—he had no business in that front line, and no one knew that fact better than he did. The puniest Valerian of the company could do in full armor a standing high jump of over fourteen feet; and could dodge, feint, parry, and swing with a blinding speed starkly impossible to any member of any of the physically lesser breeds of man.

Approaching the building they spread out, surrounded it; and at a signal from a helicopter that the ring was complete, the assault began. Doors and windows were locked, barred, and barricaded, of course; but what of that? A few taps of the axes and a few blasts of the DeLameters took care of things very nicely; and through the openings thus made there leaped, dove, rolled, or strode the space black-and-silver warriors of the Galactic Patrol. Valerians, than whom no fiercer race of hand-to-hand fighters has ever been known—no bifurcate race, and but very few others, however built or shaped, have ever willingly come to grips with the armored axmen of Valeria!

Not by choice, then, but of necessity and in sheer desperation the pirates fought. In the vicious beams of their portables the stone walls of the room glared a baleful red; in spots even were pierced through. Old-fashioned pistols barked, spitting steel-jacketed lead. But the G-P suits were screened against lethal beams by generators capable of withstanding anything of lesser

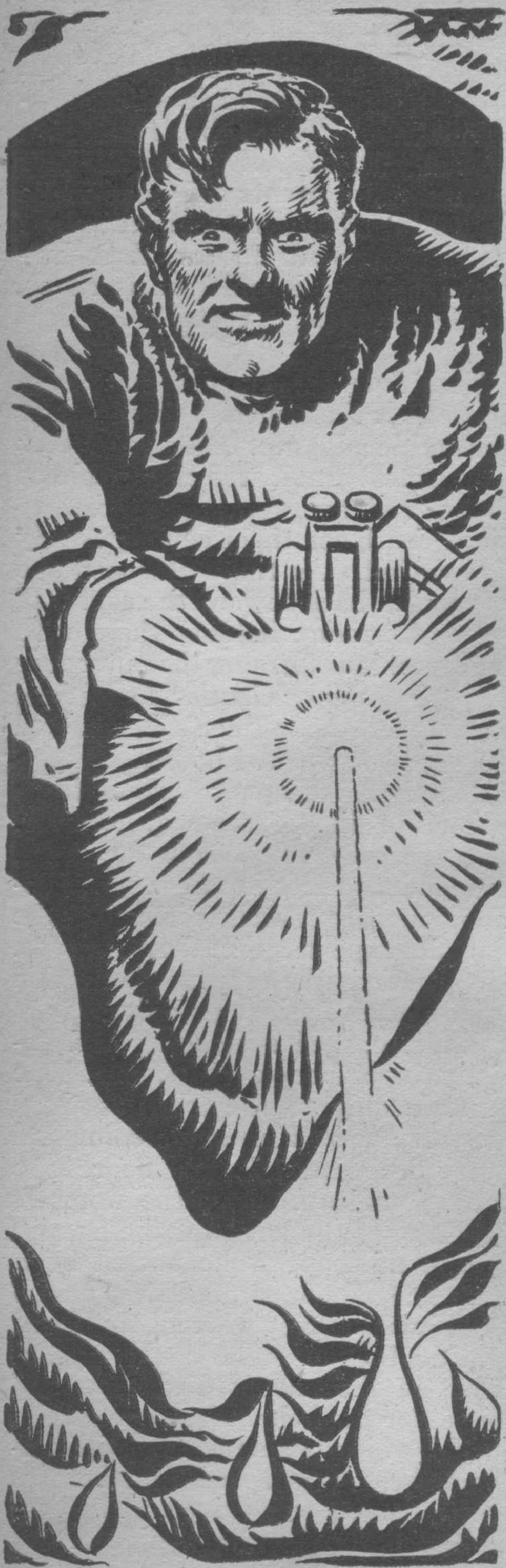
power than a semiportable projector; G-P armor was proof against any projectile possessing less energy than that hurled by the high caliber machine rifle. Thus the Boskonian beams splashed off the Valerian's screens in torrents of man-made lightning and in pyrotechnic displays of multicolored splendor, their bullets ricocheted harmlessly as spent, misshapen blobs of metal.

THE PATROLMEN did not even draw their DeLameters during their inexorable advance. They knew that the pirates' armor was as capable as theirs, and the women were not to die if death for them could possibly be avoided. As they advanced the enemy fell back toward the center of the great room; holding there with the Lyranians forming the outer ring of their roughly circular formation; firing over the women's heads and between their naked bodies.

Kinnison did not want those women to die. It seemed, however, that die they must, from the sheer, tremendous reflection from the Valerians' fiercely radiant screens, if the Patrolmen persisted in their advance. He studied the enemy formation briefly, then flashed an order.

There ensued a startling and entirely unorthodox maneuver, one possible only to the troopers there at work, as at Kinnison's command every Valerian left the floor in a prodigious leap. Over the women's heads, over the heads of the enemy; but in midleap, as he passed over, each Patrolman swung his ax at a Boskonian helmet with all the speed and all the power he could muster. Most of the enemy died then and there, for the helmet has never been forged which is able to fend the diamond beak of a space ax driven as each of those was driven. The fact that the Valerians were nine or ten





feet off the floor at the time made no difference whatever. They were space fighters, trained to handle themselves and their weapons in any position or situation; with or without gravity, with or without even inertia.

"You persons—run! Get out of here! SCRAM!" Kinnison fairly shouted the thought as the Valerians left the floor, and the matriarchs obeyed—frantically. Through doors and windows they fled, in all directions and at the highest possible speed.

But in their enthusiasm to strike down the foe, not one of the Valerians had paid any attention to the exact spot upon which he was to land; or, if he did, someone else got there either first or just barely second. Besides, there was not room for them all in the center of the ring. For seconds, therefore, confusion reigned and a boiler-works clangor resounded for a mile around as a hundred and one extra-big and extra-heavy men, a writhing, kicking, pulling tangle of armor, axes, and equipment, jammed into a space which half their number would have filled overfull. Sulphurous Valerian profanity and sizzling deep-space oaths blistered the very air as each warrior struggled madly to right himself, to get one more crack at a pirate before somebody else beat him to it.

During this terrible melee some of the pirates released their screens and committed suicide. A few got out of the room, but not many. Nor far; the men in the helicopters saw to that. They had needle beams, powered from the *Dauntless*, which went through the screens of personal armor as a knife goes through ripe cheese.

"Save it, guys—hold everything!" Kinnison yelled as the tangled mass of Valerians resolved itself into erect



and warlike units. "No more ax work—don't let them kill themselves—catch them ALIVE!"

They did so, quickly and easily. With the women out of the way, there was nothing to prevent the Valerians from darting right up to the muzzles of the foes' DeLameters. Nor could the enemy dodge, or run, half fast enough to get away. Armored, shielded hands batted the weapons away—if an arm or leg broke in the process, what the hell?—and the victim was held motionless until his turn came to face the mind-reading Kinnison.

Nothing. Nothing, flat. A string of zeros. And, bitterly silent, Kinnison led the way back to the *Dauntless*. The men he wanted, the ones who knew anything, were the ones who killed themselves, of course. Well, why not? In like case, officers of the Patrol had undoubtedly done the same. The live ones didn't know where their planet was, could give no picture even of where it lay in the Galaxy, did not know where they were going, nor why. Well, so what? Wasn't ignorance the prime characteristic of the bottom layers of dictatorships everywhere? If they had known anything, they would have been under orders to kill themselves, too, and would have done it.

In his con room in the *Dauntless* his black mood lightened somewhat and he called the Elder Person.

"Helen of Troy? I suppose that the best thing we can do now, for your peace of mind, prosperity, well-being, et cetera, is to drill out of here as fast as Klono and Noshabkeming will let us. Right?"

"Why, I . . . you . . . um . . . that is." The matriarch was badly flustered at the Lensman's bald summation of her attitude. She did not want to agree, but she certainly did not want these males around a sec-

ond longer than was necessary.

"Just as well say it, because it goes double for me—you can play it clear across the board, toots, that if I ever see you again it will be because I can't get out of it." Then, to his chief pilot:

"QX, Hen, give her the oof—back to Tellus."

## VII.

THROUGH the ether the mighty *Dauntless* bored her serene way homeward, at the easy touring blast—for her—of some eighty parsecs an hour. The engineers inspected and checked their equipment, from instrument needles to blast nozzles; re-lining, repairing, replacing anything and everything which showed any sign of wear or strain because of what the big vessel had just gone through. Then they relaxed into their customary routine of killing time—the games of a dozen planets and the vying with each other in the telling of outrageously untruthful stories.

The officers on watch lolled at ease in their cushioned seats, making much ado of each tiny thing as it happened, even the changes of watch. The Valerians, as usual, remained invisible in their own special quarters. There the gravity was set at twenty-seven hundred instead of at the Tellurian normal of nine hundred eighty, there the atmospheric pressure was forty pounds to the square inch, there the temperature was ninety-six degrees Fahrenheit, and there Van Buskirk and his fighters lived and moved and had their daily drills of fantastic violence and stress. They were irked less than any of the others by monotony; being, as has been intimated previously, neither mental nor intellectual giants.

And Kinnison, mirror-polished gray boots stacked in all their majes-



tic size upon a corner of his desk, leaned his chair precariously backward and thought in black concentration. It *still* didn't make any kind of sense. He had just enough clues—fragments of clues—to drive a man nuts. Menjo Bleeko was the man he wanted. On Lonabar. To find one was to find the other, but how in the steaming hells of Venus was he going to find either of them? It might seem funny not to be able to find a thing as big as a planet—but since nobody knew where it was, by fifty thousand parsecs, and since there were millions and skillions and whillions of planets in the Galaxy, a random search was quite definitely out. Bleeko was a zwilnik, or tied in with zwilniks, of course; but he could read a million zwilnik minds without finding, except by merest chance, one having any contact with or knowledge of the Lonabarian.

The Patrol had already scoured—fruitlessly—Aldebaran II for any sign, however slight, pointing toward Lonabar. The planetographers had searched the files, the charts, the libraries thoroughly. No Lonabar. Of course, they had suggested—what a help!—they might know it under some other name. Personally, he didn't think so, since no jeweler throughout the far-flung bounds of civilization had as yet been found who could recognize or identify any of the items he had described.

Whatever avenue or alley of thought Kinnison started along, he always ended up at the jewels and the girl. Illona, the squirrel-brained, romping, joyous little imp who by now owned in fee simple half of the ship and nine tenths of the crew. Why in Palain's purple hells couldn't she have had a brain back of that beautiful pan? But at that, he had to admit, she was smarter than most—you couldn't expect any other

woman in the Galaxy to have a mind like Mac's.

For minutes, then, he abandoned his problem and reveled in visions of the mental and physical perfections of his fiancée. But this was getting him nowhere, fast. The girl or the jewels—which? They were the only real angles he had.

He sent out a call for her, and in a few minutes she came swirling in. How different she was from what she had been! Gone were the somberness, the dread, the terror which had oppressed her; gone were the class-conscious inhibitions against which she had been rebelling, however subconsciously, since childhood. Here she was *free!* The boys were free, *everybody* was free! She had expanded tremendously—unfolded. She was living as she had never dreamed it possible to live. Each new minute was an adventure in itself. Her black eyes, once so dull, sparkled with animation; radiated her sheer joy in living. Even her jet-black hair seemed to have taken on a new luster and gloss, in its every precisely arranged wavelet.

"HI, LENSMAN!" Illona burst out, before Kinnison could say a word or think a thought in greeting. "I'm so glad you sent for me, because there's something I've been wanting to ask you for days. The boys are going to throw a blowout, with all kinds of stunts, and they want me to do a dance. QX, do you think?"

"Sure. Why not?"

"Clothes," she explained. "I told them I couldn't dance in a dress, and they said that I wasn't supposed to, that acrobats didn't wear dresses when they performed on Tellus. I said they lied like thieves and they swore they didn't—said to ask the Old Man—" She broke off, two knuckles jammed into her mouth, ex-



pressive eyes wide in sudden fright. "Oh, excuse me, sir," she gasped. "I didn't—"

"'Smatter? What bit you?" Kinnison asked, then got it. "Oh . . . the 'Old Man,' huh? QX, angel face, that is standard nomenclature in the Patrol. Not with you folks, though, I take it?"

"I'll say not," she breathed. She acted as though a catastrophe had been averted by the narrowest possible margin. "Why, if anybody got caught even *thinking* such a thing, the whole crew would go into the steamer that very minute. And if I would dare to say 'Hi' to Menjo Bleeko—" She shuddered.

"Nice people," Kinnison commented.

"But are you sure that the . . . that I'm not getting any of the boys into trouble?" she pleaded. "For, after all, none of them ever dare call you that to your face, you know."

"You haven't been around enough yet," he assured her. "On duty, no; that's discipline—necessary for efficiency. And I haven't hung around the wardrooms much of late—been too busy. But at the party you'll be surprised at some of the things they call me—if you happen to hear them. You've been practicing—keeping in shape?"

"Uh-huh," she confessed. "In my room, with the spy-ray block on."

"Good. No need to hide, though, and no need to wear dresses any time you're practicing—the boys were right on that. What do you think of this pseudoinertia as compared to the real thing?" He did not, actually, care what she thought of it; he was merely making conversation to cover up the fact that he was probing the deepest recesses of her mind.

"I like it, even better in some ways. Your legs and arms feel as though they were following through

perfectly, but if you kick something, or come down too hard in a forward flip—back flips are easy—it doesn't hurt. It's nice."

"Must be," he agreed, absently. "Got to watch out for yourself, though, when you get back onto a planet. Now I want you to help me. Will you?"

"Yes, sir. In anything I can—*anything*, sir," she answered, instantly.

"I want you to give me every scrap of information you possibly can about Lonabar; its customs and habits, its work and its play—everything, even its money and its jewelry." This last apparently an afterthought. "To do so, you'll have to let me into your mind of your own free will—you'll have to cooperate to the limit of your capability. QX?"

"That will be quite all right, Lensman," she agreed, shyly. "I know now that you are not going to hurt me."

Illona did not like it at first, there was no question of that. And small wonder. It is an intensely disturbing thing to have your mind invaded, knowingly, by another; particularly when that other is the appallingly powerful mind of Gray Lensman Kimball Kinnison. There were lots of things she did not want exposed, and the very effort not to think of them brought them ever and ever more vividly to the fore. She squirmed, mentally and physically: her mind was for minutes a practically illegible turmoil. But she soon steadied down and, as she got used to the new sensations, she went to work with a will. She could not increase materially the knowledge of the planet which Kinnison had already obtained from her, but she was a mine of information concerning the peculiar gems. She knew all



about every one of them, with the completely detailed knowledge one is all too apt to have of a thing long and intensely desired, but supposedly forever out of reach.

"Thanks, Illona." It was over; the Lensman knew as much as she did about everything which had any bearing upon his quest. "You have helped a lot—now you can flit."

"I'm glad to help, sir, really—any time. I'll see you at the party, then, if not before." Illona left the room in a far more subdued fashion than she had entered it. She had always been more than half afraid of Kinnison; just being near him did things to her which she did not quite like. And this last thing, this mind-searching interview, did not operate to quiet her fears. It gave her the screaming meemies, no less!

AND KINNISON, alone in his room, called for a tight beam to Prime Base. He wanted something, he explained, when the visage of Port Admiral Haynes appeared upon his plate. Something big, something that had never been tried before. Namely, a wide-open, Lens-to-Lens conference with all the Lensmen—particularly all the Unattached Lensmen—of the whole Galaxy, at the same time. Could it be arranged?

"*Whew!*" the admiral whistled. "I was in on a wide-open ten-way, once, but that's as high as I ever tried it. What's your thought as to technique?"

"Set a definite time, far enough ahead to give everybody notice. At that time, have everybody tune to your frequency. Since everybody will be *en rapport* with you, we will all be *en rapport* with each other, automatically."

"Seems reasonable—can do, I think. It will take at least a day to arrange the hookup. Day and a

half, maybe. Say hour twenty tomorrow."

"QX. Hour twenty, on the line."

The next day dragged, even for the always-busy Kinnison. He prowled about, aimlessly. He saw the beautiful Aldebaranian several times, noticing as he did so something which he had not hitherto really observed, but which tied in nicely with a fact he had half seen in the girl's own mind, before he could dodge it—that whenever she made a twosome with any man, the man was Chief Pilot Henderson.

"Blasted, Hen?" he asked, casually, as he came upon the pilot in a corner of a wardroom, staring fixedly at nothing.

"Out of the ether," Henderson admitted. "I want to talk to you."

"G. A., we're alone—or, better yet, on the Lens. About Illona, the Aldebaranian zwilnik, I suppose."

"Don't Kim," Henderson flinched. "She isn't a zwilnik, really—I'd bet my last millo on that?"

"Are you telling me, or asking me?" the Lensman asked.

"I don't know," Henderson hesitated. "I wanted to ask you . . . you know, you've got a lot of stuff that the rest of us haven't. I'm punctured plenty, and it's getting worse. Is there any reason, chief, why I shouldn't, well . . . er . . . get married?"

"Every reason in the book why you should, Hen. Why, when I get to be as old as you are, I hope to be retired, married, and the father of two or three kids."

"Damnation, Kim! That isn't what I meant, and you know it!"

"Think clearly, then; for your own sake and Illona's; not mine," Kinnison ordered. "Yes, I know what you mean, but you've got to bring it out into the open, yourself, to do any good."



"QX. Have I the permission of Kimball Kinnison, Unattached Lensman of the Galactic Patrol, to marry Illona Potter, if I've got jets enough to swing it?"

Mighty clever, the Lensman thought. Since all the men of the Patrol were notoriously averse to going sloppy or maudlin about it, he wondered just how the pilot was going to phrase his question. Hen had done it very neatly, by tossing the buck right back at him. But he wouldn't get sloppy, either. The "untarnished - meteors - upon - the - collars-of-the-Patrol" stuff was QX for Earthly spellbinders, but it didn't fit in anywhere else. So:

"That's better," Kinnison approved. "As far as I know—and in this case I bashfully admit that I know it all—everything is on the green. All you've got to worry about is the opposition of twelve hundred or so other guys in this can, and the fact that Illona will probably blast you to a cinder."

"Huh? Those apes? That? Watch my jets!" Henderson strode away, doubts all resolved; and Kinnison, seeing that hour twenty was very near, went to his own room.

PRECISELY upon the hour the Lensman tuned his—not his Lens, really, since he no longer needed that, but in all probability his very ego to that of Port Admiral Haynes. He had wondered frequently what it was going to feel like; but, having experienced it, he could never afterward describe it even in part.

It is difficult for any ordinary mind to conceive of its being in complete accord with any other, however closely akin. Consider, then, how utterly impossible it is to envision that merging of a hundred thousand, or five hundred thousand, or a million—nobody ever did know how

many Lensmen tuned in that day—minds so utterly different that no one human being can live long enough even to see each of the races there represented! Probably less than half of them were even approximately human. Many were not mammals, many were not warm-blooded. Not all, by far, were even oxygen breathers—oxygen, to many of those races, was sheerest poison. Nevertheless, they had much in common. All were intelligent; most of them very highly so; and all were imbued with the principles of freedom and equality for which Galactic Civilization stood and upon which it was fundamentally based.

That meeting was staggering, even to Kinnison's mind. It was appalling—yet it was ultimately thrilling, too. It was one of the greatest, one of the most terrific thrills of the Lensman's long life.

"Thanks, fellows, for coming in," he began, simply. "I will make my message very short. As Haynes may have told you, I am Kinnison of Tellus. It will help greatly in locating the head of the Boskonian culture if I can find a certain planet, known to me only by the name of Lonabar. Its people are human beings to the last decimal; its rarest jewels are these," and he spread in the collective mind a perfect, exactly detailed and pictured description of the gems. "Does any one of you know of such a planet? Has any one of you ever seen a stone like any of these?"

A pause—a heartbreakingly long pause. Then a faint, soft, diffident thought appeared; appeared as though seeping slowly from a single cell of that incredibly linked, million-fold-composite Lensmen's BRAIN.

"I waited to be sure that no one else would speak, as my information is very meager, and unsatisfactory,



and old," the thought apologized.

"Whatever its nature, any information at all is very welcome," Kinnison replied. "Who is speaking, please?"

"Nadreck of Palain VII, Unattached. Many cycles ago I secured, and still have in my possession, a crystal—or rather, fragment of a supercooled liquid—like one of the red gems you showed us; the one having practically all its transmittance in a very narrow band centering at point seven, oh, oh."

"But you do not know what planet it came from—is that it?"

"Not exactly," the soft thought went on. "I saw it upon its native planet, but unfortunately I do not now know just what or where that planet was. We were exploring at the time, and had visited many planets. Not being interested in any world having an atmosphere of oxygen, we paused but briefly, nor did we map it. I was interested in the fusion because of its peculiar filtering effect, hence bought it from its owner. A scientific curiosity merely."

"Do you believe that you could find the planet again?"

"By checking back upon the planets we did map, and by retracing our route, I should be able to . . . ; yes, I am certain that I can do so."

"And when Nadreck of Palain VII says that he is certain of anything," another thought appeared, "nothing in the macrocosmic universe is more certain."

"I thank you, Twenty-four of Six, for the expression of confidence."

"And I thank both of you particularly, as well as all of you collectively," Kinnison broadcast. Then, as intelligences by the tens of thousands began to break away from the linkage, he continued to Nadreck:

"You will map this planet for me,

then, and send the data in to Prime Base?"

"I will map the planet and will myself bring the data to you at Prime Base. Do you want some of the gems, also?"

"I don't think so," Kinnison thought swiftly. "No, better not. They'll be harder to get now, and it might tip our hand too much. I'll get them myself, later. Will you inform me, through Haynes, when to expect you upon Tellus?"

"I will so inform you. I will proceed at once, with speed."

"Thanks a million, Nadreck—clear ether!" and everyone cut loose.

THE SHIP sped on, and as it sped, Kinnison continued to think. He attended the "blow-out." Ordinarily he would have been right in the thick of it; but this time, young though he was and enthusiastic, he simply could not tune in. Nothing fitted, and until he could see a picture that made some kind of sense he could not let go. He listened to the music with half an ear, he watched the stunts with only half an eye.

He forgot his problem for a while when, at the end, Illona Potter danced. For Lonabarian acrobatic dancing is not like the Tellurian art of the same name. Or rather, it is like it, except more so—much more so. An earthly expert would be scarcely a novice on Lonabar, and Illona was a Lonabarian expert. She had been training, intensively, all her life, and even in Lonabar's chill social and psychological environment she had loved her work. Now, reveling as she was in the first realization of liberty of thought and of person, and inspired by the heartfelt applause of the spacehounds so closely packed into the hall, she put on something more than an exhibi-



tion of coldly impersonal skill and limberness. And the feelings, both of performer and of spectators, were intensified by the fact that, of all the repertoire of the *Dauntless*' superb orchestra, Illona liked best to dance to the stirring strains of "Our Patrol." "Our Patrol," which any man who has ever worn the space black-and-silver will say is the greatest, grandest, most glorious, most terrific piece of music that ever was or ever will be written, played, or sung! Small wonder, then, that the dancer really "gave," or that the mighty cruiser's walls almost bulged under the applause of Illona's "boys" at the end of her first number.

They kept her at it until Captain Craig stopped it, to keep the girl from killing herself. "She's worn down to a nub," he declared, and she was. She was trembling. She was panting; her almost lacquered-down hair stood out in wild disorder. Her eyes were starry with tears—happy tears. Then the ranking officers made short speeches of appreciation and the spectators carried the actors—actual carrying, in Illona's case, upon an improvised throne—off for refreshments.

Back in his quarters, Kinnison tackled his problem again. He could work out something on Lonabar now, but what about Lyrane? It tied in, too—there was an angle there, somewhere. To get it, though, somebody would have to get close to—really friendly with—the Lyranians. Just looking on from the outside wouldn't do. Somebody they could trust and would confide in—and they were so damnably, so fanatically non-co-operative! A man couldn't get a millo's worth of real information—he could read any one mind by force, but he'd never get the right one. Neither could Worsel or Tregonsee or any other nonhuman

Lensman; the Lyranians just simply didn't have the galactic viewpoint. No, what he wanted was a human woman Lensman, and there weren't any—

At the thought he gasped; the pit of his stomach felt cold. Chris! She was more than half Lensman already—she was the only un-Lensed human being who had ever been able to read his thoughts. But he didn't have the gall, the sheer, brazen crust, to shove a load like that onto *her*—or did he? Didn't the job come first? Wouldn't Chris be big enough to see it that way? Sure, she would! As to what Haynes and the rest of the Lensmen would think—let them think! In this, he had to make his own decisions.

He couldn't. He sat there for an hour; teeth locked until his jaws ached, fists clenched.

"I can't make that decision alone," he breathed, finally. "Not jets enough by half," and he shot a thought to distant Arisia and Mentor the Sage.

"This intrusion is necessary," he thought coldly, precisely. "It seems to me to be wise to do this thing which has never before been done. I have no data, however, upon which to base a decision and the matter is grave. I ask, therefore—is it wise?"

"You do not ask as to repercussions—consequences—either to yourself or to the woman?"

"I ask what I asked."

"Ah, Kinnison of Tellus, you truly grow. You at last learn to think. It is wise," and the telepathic link snapped.

Kinnison slumped down in relief. He had not known what to expect. He would not have been surprised if the Arisian had pinned his ears back; he certainly did not expect either the compliment or the clear-



cut answer. He knew that Mentor would give him no help whatever in any problem which he could possibly solve alone; he was just beginning to realize that the Arisian *would* aid him in matters which were absolutely, intrinsically, beyond his reach.

Recovering, he flashed a call to Surgeon General Lacy.

"Lacy? Kinnison. I would like to have Sector Chief Nurse Clarrissa MacDougall detached at once. Please have her report to me here aboard the *Dauntless*, en route, at the earliest possible moment of rendezvous."

"Huh? What? You can't . . . you wouldn't—" the old Lensman gurgled.

"No, I wouldn't. The whole corps will know it soon enough, so I might as well tell you now that I'm going to make a Lensman out of her."

Lacy exploded then, but Kinnison had expected that.

"Seal it!" he counseled, sharply. "I am not doing it entirely on my own—Mentor of Arisia made the final decision. Prefer charges against me if you like, but in the meantime please do as I request."

And that was that.

### VIII.

A FEW HOURS before the time of rendezvous with the cruiser which was bringing Chris out to him, the detectors picked up a vessel whose course, it proved, was set to intersect their own. A minute or so later a sharp, clear thought came through Kinnison's Lens.

"Kim? Raoul. Been flitting around out Arisia way, and they called me in and asked me to bring you a package. Said you'd be expecting it. QX?"

"Hi, Spacehound! QX." Kinnison had very decidedly not been expecting it—he had thought that he

would have to do the best he could without it—but he realized instantly, with a thrill of gladness, what it was. "Inert? Or can't you stay?"

"Free. Got to make a rendezvous. Can't take time to inert—that is, if you'll inert the thing in your cocoon. Don't want it to hole out on you, though."

"Can do. Free it is. Pilot room! Prepare for inertialess contact with vessel approaching. Magnets. Messenger coming aboard—free."

The two speeding vessels flashed together, at all their unimaginable velocities, without a thump or jar. Magnetic clamps locked and held. Air-lock doors opened, shut, opened; and at the inner port Kinnison met Raoul la Forge, his classmate through the four years at Wentworth Hall. Brief but hearty greetings were exchanged, but the visitor could not stop. Lensmen are busy men.

"Fine seeing you, Kim—be sure and inert the thing—clear ether!"

"Same to you, ace. Sure, I will—think I want to tear a guy's arm off?"

Indeed, inerting the package was the Lensman's first care, for in the free condition it was a frightfully dangerous thing. Its intrinsic velocity was that of Arisia, while the ship's was that of Lyrane II. They might be forty or fifty miles per second apart; and if the *Dauntless* should go inert that harmless-looking package would instantly become a meteorite inside the ship. At the thought of that velocity he paused. The cocoon would stand it—but would the Lens? Oh, sure, the Arisian knew that this was coming; the Lens would be packed to stand it.

Kinnison wrapped the package in heavy gauze, then in roll after roll of spring steel mesh. He jammed heavy steel springs into the ends,

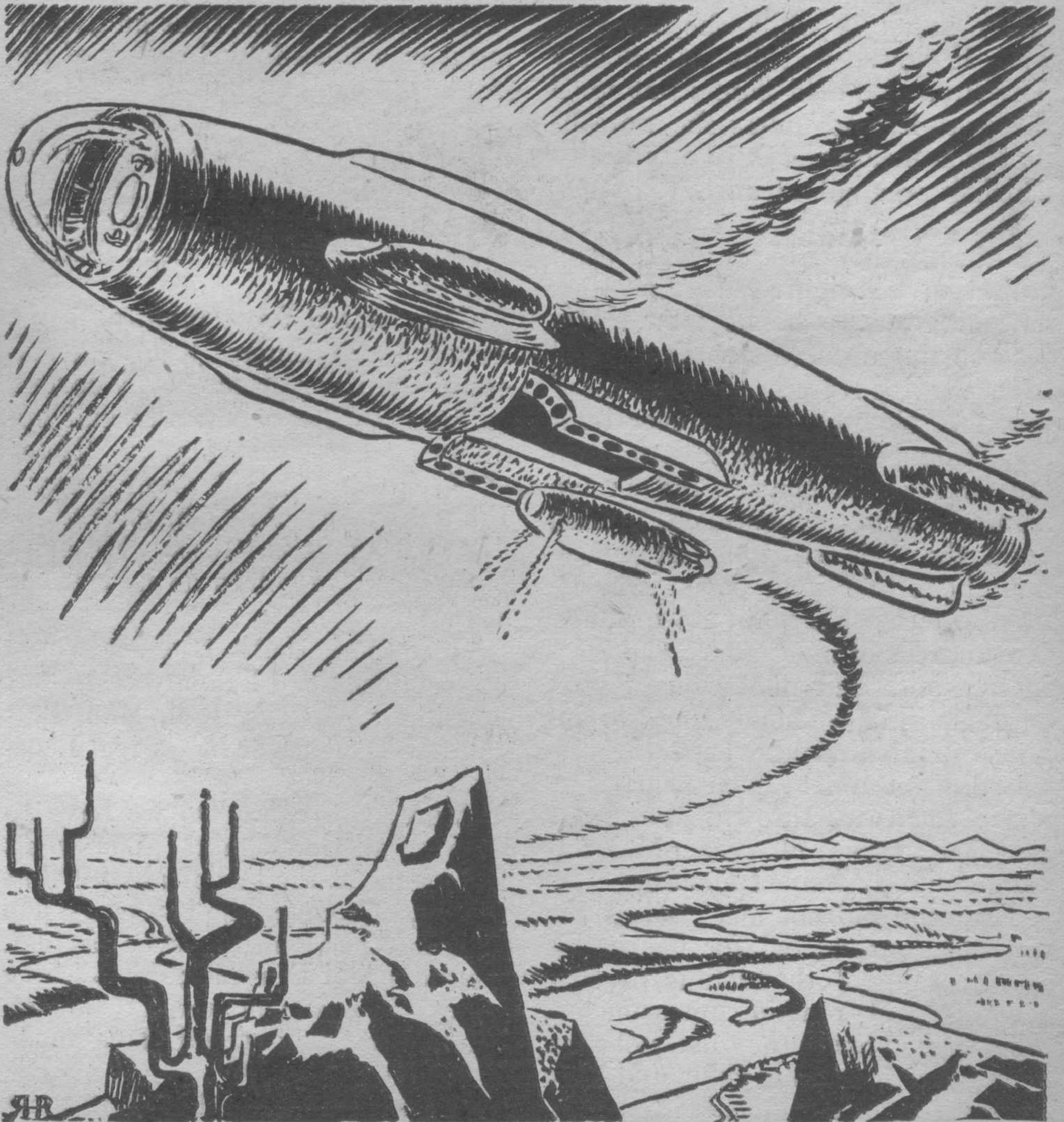


then clamped the whole thing into a form with tool-steel bolts an inch in diameter. He poured in two hundred pounds of metallic mercury, filling the form to the top. Then a cover, also bolted on. This whole assembly went into the "cocoon," a cushioned, heavily padded affair suspended from all four walls, ceiling, and floor by every shock-absorbing device known to the engineers of the Patrol.

The *Dauntless* inerted briefly at Kinnison's word and it seemed as

though a troop of elephants were running silently amuck in the cocoon room. The package to be inerted weighed no more than eight ounces—but eight ounces of mass, at a relative velocity of fifty miles per second, possesses a kinetic energy by no means to be despised.

The frantic lurchings and bouncings subsided, the cruiser resumed her free flight, and the man undid all that he had done. The Arisian package looked exactly as before, but it was harmless now; it had the same





intrinsic velocity as did everything else aboard the vessel.

Then the Lensman pulled on a pair of thick rubber gloves and opened the package; finding, as he had expected, that the packing material was a dense, viscous liquid. He poured it out and there was the Lens—Chris' Lens! He cleaned it carefully, then wrapped it in heavy insulation. For of all the billions of unnumbered billions of living entities in existence, Clarrissa MacDougall was the only one whose flesh could touch that apparently innocuous jewel with impunity. Others could safely touch it while she wore it, while it glowed with its marvelously polychromatic cold flame; but until she wore it, and unless she wore it, its touch meant death to any life to which it was not attuned.

SHORTLY thereafter another Patrol cruiser hove in sight. This meeting, however, was to be no casual one, for the nurse could not be inerted from the free state in the *Dauntless'* cocoon. No such device ever built could stand it—and those structures are stronger far than is the human frame. Any adjustment which even the hardest, toughest spacehound can take in a cocoon is measured in feet per second, not in miles.

Hundreds of miles apart, the ships inerted and their pilots fought with supreme skill to make the two intrinsics match. And even so the vessels did not touch, even nearly. A space line was thrown; the nurse and her space roll were quite unceremoniously hauled aboard.

Kinnison did not meet her at the air lock, but waited for her in his con room; and the details of that meeting will remain unchronicled. They were young, they had not seen each other for a long time, and they were very much in love. It is evident,

therefore, that Patrol affairs were not the first matters to be touched upon. Nor, if the historian has succeeded even partially in portraying truly the characters of the two persons involved, is it either necessary or desirable to go at any length into the argument they had as to whether or not she should be inducted so cavalierly into a service from which her sex had always, automatically, been barred. He did not want to make her carry that load, but he had to; she did not—although for entirely different reasons—want to take it.

He shook out the Lens and, holding it in a thick-folded corner of the insulating blanket, flicked one of the girl's fingertips across the bracelet. Satisfied by the fleeting flash of color which swept across the jewel, he snapped the platinum-iridium band around her left wrist, which it fitted exactly.

Chris stared for a minute at the smoothly, rhythmically flowing colors of the thing so magically sprung to life upon her wrist; awe and humility in her glorious eyes. Then:

"I can't, Kim. I simply can't. I'm not worthy of it," she choked.

"None of us is, Chris. We can't be—but we've got to do it, just the same."

"I suppose that's true—it would be so, of course. I'll do my best—but you know perfectly well, Kim, that I'm not—can't ever be—a real Lensman."

"Sure, you can. Do we have to go over all that again? You won't have some of the technical stuff that we got, of course, but you carry jets that no other Lensman ever has had. You're a real Lensman; don't worry about that—if you weren't, do you think that they would have made that Lens for you?"

"In a way I see that that must



be true, even though I can't understand it. But I'm simply scared to death of the rest of it, Kim."

"You needn't be. It'll hurt, but not more than you can stand. Don't think we'd better start that stuff for a few days yet, though; not until you get used to using your Lens. Coming at you, Lensman!" and he went into Lens-to-Lens communication, broadening it gradually into a wide-open two-way.

She was appalled at first, but entranced some thirty minutes later, when he called the lesson to a halt.

"Enough for now," he decided. "It doesn't take much of that stuff to be a great plenty, at first."

"I'll say it doesn't," she agreed. "Put this away for me until next time, will you, Kim? I don't want to wear it all the time until I know more about it."

"Fair enough. In the meantime I want you to get acquainted with a new girl friend of mine," and he sent out a call for Illona Potter.

"*Girl* friend!"

"Uh-huh. Study her. Educational no end, and she may be important. Want to compare notes with you on her later, is why I'm not giving you any advance dope on her—here she comes."

"Mac, this is Illona," he introduced them informally. "I told them to give you the cabin next to hers," he added, to the nurse. "I'll go with you to be sure that everything's on the green."

It was, and the Lensman left the two together.

"I'm awfully glad you're here," Illona said, shyly. "I've heard so much about you, Miss—"

"Mac to you, my dear—all of my friends call me that," the nurse broke in. "And you don't want to believe everything you hear, especially

aboard this space can." Her lips smiled, but her eyes were faintly troubled.

"Oh, it was nice," Illona assured her. "About what a grand person you are, and what a wonderful couple you and Lensman Kinnison make . . . why, you really *are* in love with him, aren't you?" This is surprise, as she studied the nurse's face.

"Yes," unequivocally. "And you love him, too, and that makes it—"

"Good heavens, no!" the Aldebaranian exclaimed, so positively that Clarrissa jumped.

"What? You don't? *Really?*" Gold-flecked, tawny eyes stared intensely into engagingly candid eyes of black. Mac wished then that she had left her Lens on, so that she could tell whether this bejeweled brunet hussy was telling the truth or not.

"Certainly not. That's what I meant—I'm simply scared to death of him. He's so—well—so overpowering. He's so much more—tremendous—than I am. I didn't see how any girl could possibly love him—but I understand now how you could, perhaps. You're sort of—terrific—yourself, you know. I feel as though I ought to call you 'Your Magnificence' instead of just plain Mac."

"Why, I'm no such thing!" Clarrissa exclaimed; but she softened noticeably, none the less. "And I think that I'm going to like you a lot."

"Oh-h-h—honestly?" Illona squealed. "It sounds too good to be true, you're so marvelous. But if you do, I think that Civilization will be everything that I've been afraid—so afraid—that it couldn't possibly be!"

No longer was it a feminine Lensman investigating a female *zwilnik*; it was two girls—two young, in-



tensely alive, human girls—who chattered on and on.

Days passed. Mac learned the use of her Lens as well as any first stage Lensman had ever known it. Then Kinnison, one of the few then existent second stage Lensmen, began really to bear down. Since the acquirement of the second stage of Lensmanship has been described in detail elsewhere, it need be said here only that Clarrissa MacDougall had mental capacity enough to take it without becoming insane. He suffered as much as she did; after every mental bout he was as spent as she was; but both of them stuck relentlessly to it.

As is now well known, the prime requisite of all such advanced treatment is to know with the utmost precision exactly what knowledge or ability is required. Mac had no idea as to what she wanted or needed; but Kinnison did.

He could not give her everything that the Arisian had given him, of course. Much of it was too hazy yet; more of it did not apply. He gave her everything, however, which she could handle and which would be of any use to her in the work she was to do; including the sense of perception. He did it, that is, with a modicum of help; for, once or twice, when he faltered or weakened, not knowing exactly what to do or not being quite able to do it, a stronger mind than his was always there.

AT LENGTH, approaching Tellus fast, Mac and Kim had a final conference; the consultation of two Lensmen settling the last details of procedure in a long-planned and highly important campaign.

"I agree with you that Lyrane II is a key planet," the nurse was saying, thoughtfully. "It must be, to have those expeditions from Lonabar

and the as yet unknown planet 'X' centering there."

"'X' certainly, and don't forget the possibility of 'Y' and 'Z' and maybe others," he reminded her. "The Lyrane-Lonabar linkage is the only one we are sure of. With you on one end of that and me on the other, it'll be funny if we can't trace out some more. While I'm building up an authentic identity to tackle Bleeko, you'll be getting chummy with Helen of Lyrane. That's about as far ahead as we can plan definitely right now, since this groundwork can't be hurried too much."

"And I report to you often—frequently, in fact." Mac widened her expressive eyes at her man.

"At least," he agreed. "And I'll report to you between times."

"Oh, Kim, it's nice, being a Lensman!" She snuggled closer. Some way or other, the conference had become somewhat personal. "Being *en rapport* will be almost as good as being together—we can stand it, that way, at least."

"It'll help a lot, ace, no fooling. That was why I was afraid to go ahead with it on my own hook. I couldn't be sure that my feelings were not in control, instead of my judgment—if any."

"I'd have been certain that it was your soft heart instead of your hard head if it hadn't been for Mentor," she sighed, happily. "As it is, though, I know that everything is on the green."

"All done with Illona?"

"Yes, the darling. She's the *sweetest* thing, Kim—and a storehouse of information if there ever was one. You and I know more of Boskonian life than anyone of Civilization ever knew before, I am sure. And it's so ghastly! We *must* win, Kim—we simply *must*, for the good of all creation!"



"We will." Kinnison spoke with grim finality.

"But back to Illona. She can't go with me, and she can't stay here with Hank aboard the *Dauntless* taking me back to Lyrane, and you can't watch her. I'd hate to think of anything happening to her, Kim."

"It won't," he replied, comfortably. "Ilyowicz won't sleep nights until he has her as the top-flight solo dancer in his show—even though she doesn't have to work for a living any more."

"She will, though, I think. Don't you?"

"Probably. Anyway, a couple of Haynes' smart girls are going to be her best friends, wherever she goes. Sort of keep an eye on her until she learns the ropes—it won't take long. We owe her that much, I figure."

"That much, at least. You're seeing to the selling of her jewelry yourself, aren't you?"

"No, I had a new thought on that. I'm going to buy it myself—or rather, Cartiff is. They're making up a set of paste imitations. Cartiff has to buy a stock somewhere; why not hers?"

"That's a thought—there's certainly enough of them to stock a wholesaler. 'Cartiff'—I can see that sign," she snickered. "Almost microscopic letters, severely plain, in the lower right-hand corner of an immense plate-glass window. One gem in the middle of an acre of black velvet. Cartiff, the most peculiar, if not quite the most exclusive, jeweler in the Galaxy. And nobody except you and me knows anything about him. Isn't that something?"

"Everybody will know about Cartiff pretty soon," he told her. "Found any flaws in the scheme yet?"

"Nary a flaw." She shook her head. "That is, if none of the boys overdo it, and I'm sure they won't.

I've got a picture of it," and she giggled merrily. "Think of a whole gang of sleuths from the homicide division chasing poor Cartiff, and never quite catching him!"

"Uh-huh—a touching picture indeed. But there goes the signal, and there's Tellus. We're about to land."

"Oh, I want to see!" and she started to get up.

"Look, then," pulling her down into her original place at his side. "You've got the sense of perception now, remember; you don't need visiplates."

And side by side, arms around each other, the two Lensmen watched the docking of their great vessel.

It landed. Jewelers came aboard with their carefully made wares. Assured that the metal would not discolor her skin, Illona made the exchange willingly enough. Beads were beads, to her. She could scarcely believe that she was now independently wealthy—in fact, she forgot all about her money after Ilyowicz had seen her dance.

"You see," she explained to Mac and Kinnison, "there were two things I wanted to do until Hank gets back—travel around a lot and learn all I can about your Civilization. I wanted to dance, too, but I didn't see how I could. Now I can do all three, and get paid for doing them besides—isn't that *marvelous*? And Mr. Ilyowicz said that you said that it was QX. Is it, really?"

"Right," and Illona was off.

The *Dauntless* was serviced and Mac was off, to far Lyrane.

Lensman Kinnison was supposedly off somewhere, also, when Cartiff appeared. Cartiff, the ultra-ultra; the, oh, so exclusive! Cartiff did not advertise. He catered, word spread



fast, to only the very upper flakes of the upper crust. Simple dignity was Cartiff's keynote, his insidiously spread claim; the dignified simplicity of immense wealth and impeccable social position.

What he actually achieved, however, was something subtly different. His simplicity was just a hair off beam; his dignity was an affected, not a natural, quality. Nobody with less than a million credits ever got past his door, it is true. However, instead of being the real *crème de la crème* of Earth, Cartiff's clients were those who pretended to belong to, or who were trying to force an entrance into, that select stratum. Cartiff was a snob of snobs; he built up a clientele of snobs; and, even more than in his admittedly fine and flawless gems, he dealt in equally high-proof snobbery.

Betimes came Nadreck, the Unattached Lensman of Palain VII, and Kinnison met him secretly at Prime Base. Soft-voiced as ever, apologetic, diffident; even though Kim had learned that the Palainian had a record of accomplishment as long as any one of his arms. But it was not an act, not affectation. It was simply a racial trait, for the intelligent and civilized race of that planet is in no sense human. Nadreck was utterly, startlingly unhuman. In his atmosphere there was no oxygen, in his body there flowed no aqueous blood. At his normal body temperature neither liquid water nor gaseous oxygen could exist.

The seventh planet out from any sun would, of course, be cold, but Kinnison had not thought particularly about the point until he felt the bitter radiation from the heavily insulated suit of his guest; perceived how fiercely its refrigerators were laboring to keep its internal temperature down.

"If you will permit it, please, I will depart at once," Nadreck pleaded, as soon as he had delivered his spool and his message. "My heat dissipators, powerful though they are, cannot cope much longer with this frightfully high temperature."

"QX, Nadreck—thanks a million," and the weird little monstrosity scuttled out. "Remember, Lensman's Seal on all this stuff until Prime Base releases it."

"Of course, Kinnison. You will understand, however, I am sure, that none of our races of Civilization are even remotely interested in Lonabar—it is as hot, as poisonous, as hellish generally as is Tellus itself!"

KINNISON went back to Cartiff's; and very soon thereafter it became noised abroad that Cartiff was a crook. He was a cheat, a liar, a robber. His stones were synthetic; he made them himself. The stories grew. He was a smuggler; he didn't have an honest gem in his shop. He was a *zwilnik*, an out-and-out pirate; a red-handed murderer who, if he wasn't there already, certainly ought to be in the big black book of the Galactic Patrol. This wasn't just gossip, either; everybody saw and spoke to men who had seen unspeakable things with their own eyes.

Thus Cartiff was arrested. He blasted his way out, however, before he could be brought to trial, and the newscasters blazed with that highly spectacular, murderous jail break. Nobody actually saw Cartiff escape, nobody actually saw any lifeless bodies. Everybody, however, saw the telenews broadcasts of the shattered walls and the sheeted forms; and, since such pictures are and always have been just as convincing as the real thing, everybody knew that there had been plenty of mangled corpses in those ruins and that



Cartiff was a fugitive murderer. Also, everybody knew that the Patrol never gives up on a murderer.

Hence it was natural enough that the search for Cartiff, the jeweler-murderer, should spread from planet to planet and from region to region. Not exactly obtrusively, but inexorably, it did so spread; until finally anyone interested in the subject could find upon any one of a hundred million planets unmistakable evidence that the Patrol wanted one Cartiff, description so-and-so, for murder in the first degree.

And the Patrol was thorough. Wherever Cartiff went or how, they managed to follow him. At first he disguised himself, changed his name, and stayed in the legitimate jewelry business; apparently the only business he knew. But he never could get even a start. Scarcely would his shop open than he would be discovered and forced again to flee.

Deeper and deeper he went, then, into the noisome society of crime. A fence now—still and always he clung to jewelry. But always and ever the bloodhounds of the law were baying at his heels. Whatever name he used was nosed aside and "Cartiff" they howled; so loudly that a thousand million worlds came to know that despised and hated name.

Perforce he became a traveling fence, always on the go. He flew a dead-black ship, ultrafast, armed and armored like a superdreadnought, crewed—according to the newscasts—by the hardest-boiled gang of cutthroats in the known universe. He traded in, and boasted of trading in, the most bloodstained, the most ghost-ridden gems of a thousand worlds. And, so trading, hurling defiance the while into the teeth of the Patrol, establishing himself ever more firmly as one of Civilization's cleverest and most implaca-

ble foes, he worked zigzagwise and not at all obviously toward the unexplored spiral arm in which the planet Lonabar lay. And as he moved farther and farther away from the Solarian System his stock of jewels began to change. He had always favored pearls—the lovely, glorious things so characteristically Tellurian—and those he kept. The diamonds, however, he traded away; likewise the emeralds, the rubies, the sapphires, and some others. He kept and accumulated Borovan firestones, Manarkan star drops, and a hundred other gorgeous gems, none of which would be "beads" upon the planet which was his goal.

He visited planets only fleetingly now; the Patrol was hopelessly outdistanced. Nevertheless, he took no chances. His villainous crew guarded his ship; his bullies guarded him wherever he went—surrounding him when he walked, standing behind him while he ate, sitting at either side of the bed in which he slept. He was a king snipe now.

As such he was accosted one evening as he was about to dine in a garish restaurant. A tall, somewhat fish-faced man in faultless evening dress approached. His arms were at his sides, fingertips bent into the "I'm not shooting" sign.

"CAPTAIN CARTIFF, I believe. May I seat myself at your table, please?" the stranger asked, politely, in the *lingua franca* of deep space.

Kinnison's sense of perception frisked him rapidly for concealed weapons. He was clean. "I would be very happy, sir, to have you as my guest," he replied, courteously.

The stranger sat down, unfolded his napkin, and delicately allowed it to fall into his lap, all without letting either of his hands disappear from sight, even for an instant, be-



neath the table's top. He was an old and skillful hand. And during the excellent meal the two men conversed brilliantly upon many topics, none of which were of the least importance. After it Kinnison paid the check, despite the polite protestations of his vis-à-vis. Then:

"I am simply a messenger, you will understand, nothing else," the guest observed. "No. 1 has been checking up on you, and has decided to let you come in. He will receive you tonight. The usual safeguards on both sides, of course—I am to be your guide and guarantee."

"Very kind of him, I'm sure." Kinnison's mind raced. Who could this No. 1 be? The ape had a thought screen on, so he was flying blind. Couldn't be a real big shot, though, so soon—no use monkeying with him at all. "Please convey my thanks, but also my regrets."

"What?" the other demanded. His veneer of politeness had sloughed off; his eyes were narrow, keen, and cold. "You know what happens to independent operators around here, don't you? Do you think that you can fight *us*?"

"Not fight you, no." The Lensman elaborately stifled a yawn. He now had a clue. "Simply ignore you—if you act up, smash you like bugs, that's all. Please tell your No. 1 that I do not split my takes with anybody. Tell him also that I am looking for a choicer location to settle down upon than any I have found as yet. If I do not find such a place near here, I shall move on. If I do find it I shall take it, in spite of man or the devil."

The stranger stood up, glaring in quiet fury, but with both hands still above the table. "You want to make it a war, then, Captain Cartiff!" he gritted.

"Not 'Captain' Cartiff, please," Kinnison begged, dipping one paw delicately into his finger bowl. "'Cartiff' merely, my dear fellow, if you don't mind. Simplicity, sir, and dignity; those two are my key words."

"Not for long," prophesied the other. "No. 1 will blast you out of the ether before you can swap another necklace."

"The Patrol has been trying to do that for some time now, and I'm still here," Kinnison reminded him, gently. "Caution him, please, in order to avoid bloodshed, not to come after me in only one ship, but a fleet; and suggest that he have something hotter than Patrol primaries before he tackles me at all."

Surrounded by his bodyguards, Kinnison left the restaurant, and as he walked along he reflected. Nice going, this. It would get around fast. This No. 1 couldn't be Bleeko; but the king snipe of Lonabar and its environs would hear the news in short order. He was now ready to go. He would fit around a few more days—give this bunch of zwilniks a chance to make a pass at him if they felt like calling his bluff—then on to Lonabar.

## IX.

KINNISON did not walk far, nor reflect much, before he changed his mind and retraced his steps; finding the messenger still in the restaurant.

"So you got wise to yourself and decided to crawl while the crawling's good, eh?" he sneered, before the Lensman could say a word. "I don't know whether the offer is still good or not."

"No—and I advise you to muffle your exhaust before somebody rams a ray gun down your throat." Kin-



nison's voice was coldly level. "I came back to tell you to tell your No. 1 that I'm calling his bluff. You know Checuster?"

"Of course." The zwilnik was plainly discomfited.

"Come along, then, and listen, so you'll know that I'm not running a blazer."

They sought a booth, wherein the native himself got Checuster on the visiplat.

"Checuster, this is Cartiff." The start of surprise and the expression of pleased interest revealed how well that name was known. "I'll be down at your old warehouse day after tomorrow night about this time. Pass the word around that if any of the boys have any stuff too hot for them to handle conveniently, I'll buy it; paying for it in either Patrol credits of bar platinum, whichever they like."

He then turned to the messenger. "Did you get that straight, Lizard Puss?"

The man nodded.

"Relay it to No. 1," Kinnison ordered and strode off. This time he got to his ship, which took off at once.

Cartiff had never made a habit of wearing visible arms, and his guards, while undoubtedly fast gunmen, were apparently only that. Therefore there was no reason for No. 1 to suppose that his mob would have any noteworthy difficulty in cutting this upstart, Cartiff, down. He was, however, surprised; for Cartiff did not come afoot or unarmed.

Instead, it was an armored car that brought the intruding fence through the truck entrance into the old warehouse. Not a car, either; it was more like a twenty-ton tank except for the fact that it ran upon

wheels, not treads. It was screened like a cruiser; it mounted a battery of projectors whose energies, it was clear to any discerning eye, nothing short of battle screen could handle. The thing rolled quietly to a stop, a door swung open, and Kinnison emerged. He was neither unarmed nor unarmored now. Instead, he wore a full suit of G-P armor or a reasonable facsimile thereof, and carried a semiportable projector.

"You will excuse the seeming discourtesy, men," he announced, "when I tell you that a certain No. 1 has informed me that he will blast me out of the ether before I swap a necklace on this planet. Stand clear, please, until we see whether he meant business or was just warming up his jets. Now, No. 1, if you're around, come and get it!"

Apparently the challenged party was not present, for no overt move was made. Neither could Kinnison's sense of perception discover any sign of unfriendly activity within its range. Of mind reading there was none, for every man upon the floor was, as usual, both masked and screened.

Business was slack at first, for those present were not bold souls and the Lensman's overwhelmingly superior armament gave them very seriously to doubt his intentions. Many of them, in fact, had fled precipitately at the first sight of the armored truck, and of these more than a few—No. 1's thugs, no doubt—did not return. The others, however, came filtering back as they perceived that there was to be no warfare and as cupidity overcame their timorousness. And as it became evident to all that the stranger's armament was for defense only, that he was there to buy or to barter and not to kill and thus



to steal, Cartiff trafficked ever more and more briskly, as the evening wore on, in the hottest gems of the planet.

Nor did he step out of character for a second. He was Cartiff the fence, all the time. He drove hard bargains, but not too hard. He knew jewels thoroughly by this time, he knew the code, and he followed it rigorously. He would give a thousand Patrol credits, in currency good upon any planet of Civilization or in bar platinum good anywhere, for an article worth five thousand, but which was so badly wanted by the law that its then possessor could not dispose of it at all. Or, in barter, he would swap for that article another item, worth fifteen hundred or so, but which was not hot—at least, not upon that planet. Fair enough—so fair that it was almost morning before the silently running truck slid into its storage inside the dead-black spaceship.

Then, in so far as No. 1, the Patrol, and Civilization were concerned, Cartiff and his outfit simply vanished. The *zwilnik* subchief hunted him viciously for a space, then bragged of how he had run him out of the region. The Patrol, as usual, bided its time, watching alertly. The general public forgot him completely in the next sensation to arise.

FAIRLY CLOSE although he then was to the rim of the Galaxy, Kinnison did not take any chances at all of detection in a line toward that rim. The spiral arm beyond Rift 85 was unexplored. It had been of so little interest to Civilization that even its various regions were nameless upon the charts, and the Lensman wanted it to remain that way, at least for the time being. Therefore he left the Galaxy in as nearly

a straight nadir line as he could without coming within detection distance of any trade route. Then, making a prodigious loop, so as to enter the spiral arm from the nadir direction, he threw Nadreck's map into the pilot tank and began the computations which would enable him to place correctly in that three-dimensional chart the brilliant point of light which represented his ship.

In this work he was ably assisted by his chief pilot. He did not have Henderson now, but he did have Watson, who rated No. 2 only by the hair-splitting of the supreme Board of Examiners. Such hair-splitting was, of course, necessary; otherwise no difference at all could have been found within the ranks of the first fifty of the Patrol's master pilots, to say nothing of the first three or four. And the rest of the crew did whatever they could.

For it was only in the newscasts that Cartiff's crew was one of murderous and villainous pirates. They were, in fact, volunteers; and, since everyone is familiar with what that means in the Patrol, that statement is as efficient as a book would be.

The chart was sketchy and incomplete, of course; around the flying ship were hundreds, yes, thousands, of stars which were not in the chart at all; but Nadreck had furnished enough reference points so that the pilots could compute their orientation. No need to fear detectors now, in these wild, waste spaces; they set a right-line course for Lonabar and followed it.

As soon as Kinnison could make out the continental outlines of the planet upon the plates he took over control, as he alone of the crew was upon familiar ground. He knew everything about Lonabar that Illona had ever learned; and, although the girl was a total loss as



an astronaut, she did know her geography.

Kinnison docked his ship boldly at the spaceport of Lonia, the planet's largest city and its capital. With equal boldness he registered as "Cartiff," filling in some of the blank spaces in the spaceport's routine registry form—not quite truthfully, perhaps—and blandly ignoring others. The armored truck was hoisted out of the hold and made its way to Lonia's largest bank, into which it disgorged a staggering total of bar platinum, as well as sundry coffers of hard, gray steel. These last items went directly into a private vault, under the watchful eyes and ready weapons of Kinnison's own guards.

The truck rolled swiftly back to the spaceport and Cartiff's ship took off—it did not need servicing at the time—ostensibly for another planet unknown to the Patrol, actually to go, inert, into a closed orbit around Lonabar and near enough to it to respond to a call in seconds.

Immense wealth can command speed of construction and service. Hence, in a matter of days, Cartiff was again in business. His salon was, upon a larger and grander scale, a repetition of his Tellurian shop. It was simple, and dignified, and blatantly expensive. Costly rugs covered the floor, impeccable works of art adorned the walls, and three precisely correct, flawlessly groomed clerks displayed, with the exactly right air of condescending humility, Cartiff's wares before those who wished to view them. Cartiff himself was visible, ensconced within a magnificent plate-glass-and-gold office in the rear, but he did not ordinarily have anything to do with customers. He waited; nor did he wait long before there happened that which he expected.

AST—3p





ONE of the superperfect clerks coughed slightly into a microphone.

"A gentleman insists upon seeing you personally, sir," he announced.

"Very well, I will see him now. Show him in, please," and the visitor was ceremoniously ushered into the Presence.

"This is a very nice place you have here, Mr. Cartiff, but did it ever occur to you that—"

"It never did and it never will," Kinnison snapped. He still lolled at ease in his chair, but his eyes were frosty and his voice carried an icy sting. "I quit paying protection to little shots a good many years ago. Or are you from Menjo Bleeko?"

The visitor's eyes widened. He gasped, as though even to utter that dread name were sheer sacrilege. "No, but No.—"

"Save it, slob!" The cold venom of that crisp but quiet order set the fellow back onto his heels. "I am thoroughly sick of this thing of every half-baked tinhorn zwilnik in space calling himself No. 1 as soon as he can steal enough small change to hire an ape to walk around behind him packing a couple of ray guns. If that louse of a boss of yours has a name, use it. If he hasn't, call him 'The Louse.' But cancel that No. 1 stuff. In my book there is no No. 1 in the whole damned Universe. Doesn't your mob know yet who and what Cartiff is?"

"What do we care?" The visitor gathered courage visibly. "A good big bomb—"

"Clam it, you squint-eyed slime lizard!" The Lensman's voice was still low and level, but his tone bit deep and his words drilled in. "That stuff?" he waved inclusively at the magnificent hall. "Sucker bait, nothing more. The whole works cost only a hundred thousand. Chicken feed. It wouldn't even nick the edge

of the roll if you blew up ten of them. Bomb it any time you feel the urge. But take notice that it would make me sore—plenty sore—and that I would do things about it; because I'm in a big game, not this petty-larceny racketeering and chiseling that your mob is doing, and when a toad gets in my way I step on it. So go back and tell that No. 1 of yours to case a job a lot more thoroughly than he did this one before he starts throwing his weight around. Now scram, before I feed your carcass to the other rats around here!"

Kinnison grinned inwardly as the completely deflated gangster slunk out. Good going. It wouldn't take long for *that* blast to get action. This little-shot No. 1 wouldn't dare to lift a hand, but Bleeko would have to. That was axiomatic, from the very nature of things. It was very definitely Bleeko's move next. The only moot point was as to which his nibs would do first—talk or act. He would talk, the Lensman thought. The prime reward of being a hot shot was to have people know it and bend the knee. Therefore, although Cartiff's salon was at all times in complete readiness for any form of violence, Kinnison was practically certain that Menjo Bleeko would send an emissary before he started the rough stuff.

He did, and shortly. A big, massive man was the messenger; a man wearing consciously an aura of superiority, of boundless power and force. He did not simply come into the shop—he made an entrance. All three of the clerks literally cringed before him, and at his casually matter-of-fact order they hazed the already uncomfortable customers out of the shop and locked the doors. Then one of them escorted the visitor, with a sickening servility he had



never thought of showing toward his employer and with no thought of consulting Cartiff's wishes in the matter, into Cartiff's private sanctum. Kinnison knew at first glance that this was Ghundrith Khars, Bleeko's right-hand man. Khars, the notorious, who kneeled only to his supremacy, Menjo Bleeko himself; and to whom everyone else upon Lonabar and its subsidiary planets kneeled. The big shot waved a hand and the clerk fled in disorder.

"STAND UP, worm, and give me that—" Khars began, loftily.

"Silence, fool! Attention!" Kinnison rasped, in such a drivingly domineering tone that the stupefied messenger obeyed involuntarily. The Lensman, psychologist par excellence that he was, knew that this man, with a background of twenty years of blind, dumb obedience to his every order, simply could not cope with a positive and self-confident opposition. "You will not be here long enough to sit down, even if I permitted it in my presence, which I very definitely do not. You came here to give me certain instructions and orders. Instead, you are going to listen merely; I will do all the talking.

"First. The only reason you did not die as you entered this place is that neither you nor Menjo Bleeko knows any better. The next one of you to approach me in this fashion dies in his tracks.

"Second. Knowing as I do the workings of that which your bloated leech of a Menjo Bleeko calls his brain, I know that he has a spy ray on us now. I am not blocking it out, as I want him to receive ungarbled—and I know that you would not have the courage to transmit it accurately to his foulness—everything I have to say.

"Third. I have been searching for a long time for a planet that I like. This is it. I fully intend to stay here as long as I please. There is plenty of room here for both of us without crowding.

"Fourth. Being essentially a peaceable man, I came in peace and I prefer a peaceable arrangement. However, let it be distinctly understood that I truckle to no man or entity, dead, living, or yet to be born.

"Fifth. Tell Bleeko from me to consider very carefully and very thoroughly an iceberg; its every phase and aspect. That is all—you may go."

"Bub-bub-but," the big man stammered. "An iceberg?"

"An iceberg, yes—just that," Kinnison assured him. "Don't bother to try to think about it yourself, since you've got nothing to think with. But his putrescence, Bleeko, even though he is a mental, moral, and intellectual slime lizard, can think—at least in a narrow, mean, small-souled sort of way—and I advise him in all seriousness to do so. Now get out of here, before I burn the seat of your pants off."

Khars got, gathering together visibly the shreds of his self-esteem as he did so, the clerks staring the while in dumfounded amazement. Then they huddled together, eying the owner of the establishment with a brand-new respect—a subservient respect, heavily laced with awe.

"Business as usual, boys," he counseled them, cheerfully enough. "They won't blow up the place until after dark."

The clerks resumed their places then and trade did go on, after a fashion; but Cartiff's force had not recovered its wonted blasé aplomb even at closing time.

"Just a moment." The propri-



etor called his employees together and, reaching into his pocket, distributed among them a sheaf of currency. "In case you don't find the shop here in the morning, you may consider yourselves on vacation at full pay until I call you."

They departed, and Kinnison went back to his office. His first care was to set up a spy-ray block—a block which had been purchased upon Lonabar and which was, therefore, certainly pervious to Bleeko's instruments. Then he prowled about, apparently in deep and anxious thought. But as he prowled, the eavesdroppers did not, could not know that his weight set into operation certain devices of his own highly secret installation, or that when he finally left the shop no really serious harm could be done to it except by an explosion sufficiently violent to demolish the neighborhood for blocks around. The front wall would go, of course. He wanted it to go; otherwise there would be neither reason nor excuse for doing that which for days he had been ready to do.

SINCE CARTIFF lived rigorously to schedule and did not have a spy-ray block in his room, Bleeko's methodical and efficient observers always turned off their beams when the observee went to sleep. This night, however, Kinnison was not really asleep, and as soon as the ray went off he acted. He threw on his clothes and sought the street, where he took a taxi to a certain airport. There he climbed into a rocketplane which was already warmed up and waiting for him.

Hanging from her screaming props the fantastically powerful little plane bulletted upward in a vertical climb, and as she began to slow down from lack of air her projectors took over.

A tractor reached out, seizing her gently. Her wings retracted and she was drawn into Cartiff's great spaceship; which, a few minutes later, hung poised above one of the largest, richest jewel mines of Lonabar.

This mine was, among others, Menjo Bleeko's personal property. Since overproduction would glut the market, it was being worked by only one shift of men—the day shift. It was now black night; the usual guards were the only men upon the premises. The big black ship hung there and waited.

"But suppose they don't, Kim?" Watson asked.

"Then we'll wait here every night until they do," Kinnison replied, grimly. "But they'll do it tonight, for all the tea in China. They'll have to, to save Bleeko's face."

And they did. In a couple of hours the observer at a high-powered plate reported that Cartiff's salon had just been blown to bits. Then the Patrolmen went into action.

Bleeko's mobsmen hadn't killed anybody at Cartiff's, therefore the Tallurians wouldn't kill anyone here. Hence, while ten immense beam-dirigible torpedoes were being piloted carefully down shafts and along tunnels into the deepest bowels of the workings, the guards were given warning that, if they got into their fliers fast enough, they could be fifty miles away and probably safe by zero time. They hurried.

At zero time the torpedoes let go as one. The entire planet quivered under the trip-hammer shock of detonating duodec. For those frightful, those appalling charges had been placed, by computations checked and rechecked, precisely where they would wreak the most havoc, the utmost possible measure of sheer destruction. Much of the



rock, however hard, around each one of those incredible centers of demolition was simply blasted out of existence. That is the way duodec, in massive charges, works. Matter simply cannot get out of its way in the first instants of its detonation; matter's own inherent inertia forbids.

Most of the rock between the bombs was pulverized the merest fraction of a second later. Then, the distortedly spherical explosion fronts merging, the total incomprehensible pressure was exerted as almost pure lift. The field above the mine works lifted, then; practically as a mass at first. But it could not remain as such. It could not move fast enough as a whole; nor did it possess even a minute fraction of the tensile strength necessary to withstand the stresses being applied. Those stresses, the forces of the explosions, were to all intents and purposes irresistible. The crust disintegrated violently and almost instantaneously. Rock crushed grindingly against rock, practically the whole mass reducing in the twinkling of an eye to an impalpable powder.

Upward and outward, then, the ragingly compressed gases of detonation drove, hurling everything before them. Chunks blew out sideways, flying for miles; the mind-staggeringly enormous volume of dust was hurled upward clear into the stratosphere.

Finally that awful dust cloud was wafted aside, revealing through its thinning haze a strangely and hideously altered terrain. No sign remained of the buildings or the mechanisms of Bleeko's richest mine. No vestige was left to show that anything built by or pertaining to man had ever existed there. Where those works had been, there now yawned an absolutely featureless crater; a crater whose sheer geometrical per-

fection of figure revealed with shocking clarity the magnitude of the cataclysmic forces which had wrought there.

Kinnison, looking blackly down at that crater, did not feel the glow of satisfaction which comes of a good deed well done. He detested it—it made him sick at the stomach. But, since he had had it to do, he had done it. Why in all the nine hells of Valeria did he have to be a Lensman, anyway?

Back to Lonia, then, the Lensman made his resentful way, and back to bed.

And in the morning, early, workmen began the reconstruction of Cartiff's place of business.

## X.

SINCE Kinnison's impenetrable shields of force had confined the damage to the store's front, it was not long before Cartiff's reopened. Business was and remained brisk; not only because of what had happened, but also because Cartiff's toplofty and arrogant snobbishness had an irresistible appeal to the upper layers of Lonabar's peculiarly stratified humanity. The Lensman, however, paid little enough attention to business. Outwardly, seated at his ornate desk in haughty grandeur, he was calmness itself, but inwardly he was far from serene.

If he had figured things right, and he was pretty sure that he had, it was up to Bleeko to make the next move, and it would pretty nearly have to be a peaceable one. There was enough doubt about it, however, to make the Lensman a bit jittery inside. Also, from the fact that everybody having any weight at all wore thought screens, it was almost a foregone conclusion that they had



been warned against, and were on the lookout for, THE Lensman—that never-to-be-sufficiently-damned Tellurian Lensman who had already done so much hurt to the Boskonian cause. That they now thought that one to be a well-hidden, unknown director of Lensmen, and not an actual operative, was little protection. If he made one slip, they'd have him, cold.

He hadn't slipped yet, they didn't suspect him yet; he was sure of those points. With these people to suspect was to act, and his world-circling ship, equipped with every scanning, spying, and eavesdropping device known to science, would have informed him instantly of any untoward development anywhere upon or near the planet. And his fight with Bleeko was, after all, natural enough and very much in character. It was of the very essence of Boskonian culture that king snipes should do each other to death with whatever weapons came readiest to hand. The underdog was always trying to kill the upper, and if the latter was not strong enough to protect his loot, he deserved everything he got. A callous philosophy, it is true, but one truly characteristic of Civilization's inveterate foes.

The higher-ups never interfered. Their own skins were the only ones in which they were interested. They would, Kinnison reflected, probably check back on him, just to insure their own safety, but they would not take sides in this brawl if they were convinced that he was, as he appeared to be, a struggling young racketeer making his way up the ladder of fame and fortune as best he could. Let them check—Cartiff's past had been fabricated especially to stand up under precisely that investigation, no matter how rigid it were to be!

Hence Kinnison waited, as calmly as might be, for Bleeko to move. There was no particular hurry, especially since Chris was finding heavy going and thick ether at her end of the line, too. They had been in communication at least once every day, usually oftener; and Clarrissa had reported seethingly, in near-masculine, almost deep-space verbiage, that that damned red-headed hussy of a Helen was a hard nut to crack.

Kinnison grinned sourly every time he thought of Lyrane II. Those matriarchs certainly were a rum lot. They were a pigheaded, self-centered, mulishly stubborn bunch of cock-eyed knotheads, he decided. Non-galaxy minded; as shortsightedly antisocial as a flock of mad Radeligian cateagles. He'd better—no, he hadn't better, either—he'd have to lay off. If Chris, with all her potency and charm, with all her drive and force of will, with all her sheer power of mind and of Lens, couldn't pierce their armor, what chance did any other entity of Civilization have of doing it? Particularly any male creature? He'd like to half wring their beautiful necks, all of them; but that wouldn't get him to the first check station, either. He'd just have to wait until Chris broke through the matriarchs' crust—she'd do it, too, by Klono's prehensile tail!—and then they'd really ride the beam.

So KENNISON waited—and waited—and waited. When he got tired of waiting he gave a few more lessons in snobbishness and in the gentle art of self-preservation to the promising young Lonabarian thug whom he had selected to inherit the business, lock, stock, and barrel—including good will, if any—if, as, and when he was done with it. Then he waited some more; waited, in fact,



until Bleeko was forced, by his silent pressure, to act.

It was not an overt act, nor an unfriendly—he simply called him up on the visiphone.

“What do you think you’re trying to do?” Bleeko demanded, his darkly handsome face darker than ever with wrath.

“You.” Kinnison made succinct answer. “You should have taken my advice about pondering the various aspects of an iceberg.”

“Bah!” the other snorted. “That silliness?”

“Not as silly as you think. It was a warning, Bleeko, that that which appears above the surface is but a very small portion of my total resources. But you could not or would not learn by precept; you had to have it the hard way. Apparently, however, you have learned. That you have not been able to locate my forces I am certain. I am almost as sure that you do not want to try me again, at least until you have found out what you do not know. But I can give you no more time—you must decide now, Bleeko, whether it is to be peace or war between us. I still prefer a peaceful settlement, with an equitable division of the spoils; but if you want war, so be it.”

“I have decided upon peace,” the big shot said, and the effort of it almost choked him. “I, Menjo Bleeko the Supreme, will give you a place beside me. Come to me here, at once, so that we may discuss the terms of peace.”

“We will discuss them now,” Kinnison insisted.

“Impossible! Barred and shielded as this room is—”

“It would be,” Kinnison interrupted with a nod, “for you to make such an admission as you have just made.”

“—I do not trust unreservedly this communication line. If you join me now, you may do so in peace. If you do not come to me, here and now, it is war to the death.”

“Fair enough, at that,” the Lensman admitted. “After all, you’ve got to save your face, and I haven’t—yet. And if I team up with you I can’t very well stay out of your palace forever. But before I come there I want to give you three things—a reminder, a caution, and a warning. I remind you that our first exchange of amenities cost you a thousand times as much as it did me. I caution you to consider again, and more carefully this time, the iceberg. I warn you that if we again come into conflict you will lose not merely a mine, but everything you have, including your life. So see to it that you lay no traps for me. I come.”

He went out into the shop. “Take over, Sport,” he told his gangster protégé. “I’m going up to the palace to see Menjo Bleeko. If I’m not back in two hours, and if your grapevine reports that Bleeko is out of the picture, what I’ve left in the store here is yours until I come back and take it away from you.”

“I’ll take care of it, boss—thanks,” and the Lensman knew that in true Lonabarian gratitude the youth was already, mentally, slipping a long, keen knife between his ribs.

WITHOUT a qualm, but with every sense stretched to the limit and in instant readiness for any eventuality, Kinnison took a cab to the palace and entered its heavily guarded portals. He was sure that they would not cut him down before he got to Bleeko’s room—that room would surely be the one chosen for the execution. Nevertheless, he took no chances. He was supremely ready



to slay instantly every guard within range of his sense of perception at the first sign of inimical activity. Long before he came to them, he made sure that the beams which were set to search him for concealed weapons were really search beams and not lethal vibrations.

And as he passed those beams each one of them reported him clean. Rings, of course; a stickpin, and various other items of adornment. But Cartiff, the great jeweler, would be expected to wear very large and exceedingly expensive gems. And the beam has never been projected which could penetrate those Worsel-designed, Thorndyke-built walls of force to show that any one of those flamboyant gems was not precisely what it appeared to be.

Searched, combed minutely, millimeter by cubic millimeter, Kinnison was escorted by a heavily armed quartet of Bleeko's personal guards into his supremacy's private study. All four bowed as he entered—but they strode in behind him, then shut and locked the door.

"You fool!" Bleeko gloated from behind his massive desk. His face flamed with sadistic joy and anticipation. "You trusting, greedy fool! I have you exactly where I want you now. How easy! How simple! This entire building is screened and shielded—by *my* screens and shields. Your friends and accomplices, wherever or wherever they are, can neither see you nor know what is to happen to you. If your ship attempts your rescue, it will be blasted out of the ether. I will, personally, gouge out your eyes, tear off your nails, strip your hide from your quivering carcass—" Bleeko was now, in his raging exaltation, fairly frothing at the mouth.

"That would be a good trick if you could do it," Kinnison remarked,

coldly. "But the real fact is that you haven't even tried to use that pint of blue mush that you call a brain. Do you think that I am an utter idiot? I put on an act and you fell for it—"

"Seize him, guards! Silence his yammering—tear out his tongue!" His supremacy shrieked, leaping out of his chair as though possessed.

The guards tried manfully, but before they could touch him—before any one of them could take one full step—they dropped. Without being touched by material object or visible beam, without their proposed victim having moved a muscle, they died and fell. Died instantly, in their tracks; died completely, effortlessly, painlessly, with every molecule of the all-important compound without which life cannot even momentarily exist shattered instantaneously into its degradation products; died not knowing even that they died.

Bleeko was shaken, but he was not beaten. Needle-ray men, sharpshooters all, were stationed behind those walls. Gone now the dictator's intent to torture his victim to death. Slaying him out of hand would have to suffice. He flashed a signal to the concealed marksmen, but that order, too, went unobeyed. For Kinnison had perceived the hidden gunmen long since, and before any of them could align his sights or press his firing stud each one of them ceased to live. The zwilnik then flipped on his communicator and gobbled orders. Uselessly; for death sped ahead. Before any mind at any switchboard could grasp the meaning of the signal, it could no longer think.

"You fiend!" Bleeko screamed, in mad panic now, and wrenched open a drawer in order to seize a weapon of his own. Too late. The Lensman had already leaped, and as he landed he struck—not gently. Lona-



bar's tyrant collapsed upon the thick-piled rug in a writhing, gasping heap; but he was not unconscious. To suit Kinnison's purpose he could not be unconscious; he had to be in full possession of his mind.

THE LENS MAN crooked one brawny arm around the zwilnik's neck in an unbreakable strangle hold and flipped off his thought screen. Physical struggles were of no avail: the attacker knew exactly what to do to certain nerves and ganglia to paralyze all such activity. Mental resistance was equally futile against the overwhelmingly superior power of the Tellurian's mind. Then, his subject quietly passive, Kinnison tuned in and began his search for information. Began it—and swore soulfully. This *couldn't* be so—it didn't make any kind of sense—but there it was.

The ape simply didn't know a thing about any ramification whatever of the vast culture to which Civilization was opposed. He knew all about Lonabar and the rest of the domain which he had ruled with such an iron hand. He knew much—altogether too much—about humanity and Civilization, and plainly to be read in his mind were the methods by which he had obtained those knowledges and the brutally efficient precautions he had taken to make sure that Civilization would not, in turn, learn of him.

Kinnison scowled blackly. His deductions simply *couldn't* be that far off—and besides, it wasn't reasonable that this guy was the top or that he had done all that work on his own account. He pondered deeply, staring unseeing at Bleeko's placid face; and as he pondered, some of the jig-saw blocks of the puzzle began to click into a pattern.

Then, ultracarefully, with the ut-

most nicety of which he was capable, he again fitted his mind to that of the dictator and began to trace, one at a time, the lines of memory. Searching, probing, coursing backward and forward along those deeply buried time tracks, until at last he found the breaks and the scars for which he was hunting. For, as he had told Illona, a radical mind operation cannot be performed without leaving scars. It is true that upon cold, unfriendly Jarnevon, after Worsel had so operated upon Kinnison's mind, Kinnison himself could not perceive that any work had been done. But that, be it remembered, was before any actual change had occurred; before the compulsion had been applied. The false memories supplied by Worsel were still latent, nonexistent; the true memory chains, complete and intact, were still in place.

This lug's brain had been operated upon, Kinnison now knew, and by an expert. What the compulsion was, what combination of thought stimuli it was that would restore those now nonexistent knowledges, Kinnison had utterly no means of finding out. Bleeko himself, even subconsciously, did not know. It was, it had to be, something external, a thought pattern impressed upon Bleeko's mind by the Boskonian higher-up whenever he wanted to use him; and to waste time in trying to solve *that* problem would be the sheerest folly. Nor could he discover how that compulsion had been or could be applied. If he got his orders from the Boskonian high command direct, there would have to be an intergalactic communicator; and it would in all probability be right here, in Bleeko's private rooms. No force ball, or anything else that could take its place, was to be found. Therefore Bleeko was, probably,



merely another Regional Director, and took orders from someone here in the First Galaxy.

Lyrane? The possibility jarred Kinnison. No real probability pointed that way yet, however; it was simply a possibility, born of his own anxiety. He couldn't worry about it—yet.

His study of the zwilnik's mind, unproductive although it was of the desired details of things Boskonian, had yielded one highly important fact. His supremacy of Lonabar had sent at least one expedition to Lyrane II; yet there was no present memory in his mind that he had ever done so. Kinnison had scanned those files with surpassing care, and knew positively that Bleeko did not now know even that such a planet as Lyrane II existed.

COULD he, Kinnison, be wrong? Could somebody other than Menjo Bleeko have sent that ship? Or those ships, since it was not only possible, but highly probable, that that voyage was not an isolated instance? No, he decided instantly. Illona's knowledge was far too detailed and exact. Nothing of such importance would be or could be done without the knowledge and consent of Lonabar's dictator. And the fact that he did not now remember it was highly significant. It meant—it *must* mean—that the new Boskone or whoever was back of Boskone considered the solar system of Lyrane of such vital importance that knowledge of it must never, under any circumstances, get to Star A Star, the detested, hated, and feared Director of Lensmen of the Galactic Patrol! And Mac was on Lyrane II—ALONE! She had been safe enough so far, but—

"Chris!" he sent her an insistent thought.

"Yes, Kim?" came flashing answer.

"Thank Klono and Noshabkeming! You're QX, then?"

"Why, of course. Why shouldn't I be, the same as I was this morning?"

"Things have changed since then," he assured her, grimly. "I've finally cracked things open here, and I find that Lonabar is simply a dead end. It's a feeder for Lyrane, nothing else. It's not a certainty, of course, but there's a very distinct possibility that Lyrane is IT. If it is, I don't need to tell you that you're on a mighty hot spot. So I want you to quit whatever you're doing and run. Hide. Crawl into a hole and pull it in after you. Get into one of Helen's deepest crypts and have somebody sit on the lid. And do it right now—five minutes ago would have been better."

"Why, Kim!" she giggled. "Everything here is exactly as it has always been. And surely, you wouldn't have a Lensman hide, would you? Would you, yourself?"

That question was, they both knew, unanswerable. "That's different," he, of course, protested, but he knew that it was not. "Well, anyway, be careful," he insisted. "More careful than you ever were before in your life. Use everything you've got, every second, and if you notice anything, however small, the least bit out of the way, let me know, right then."

"I'll do that. You're coming, of course." It was a statement, not a question.

"I'll say I am—in force! 'By, Chris—BE CAREFUL!" and he snapped the line. He had a lot to do. He had to act fast, and had to be right—and he couldn't take all day in deciding, either.



KINNISON'S MIND flashed back over what he had done. Could he cover up? Should he cover up, even if he could? Yes and no. Better not even try to cover Cartiff up, he decided. Leave that trail just as it was; wide and plain—up to a certain point. This point, right here. Cartiff would disappear here, in Bleeko's palace.

He was done with Cartiff, anyway. They would smell a rat, of course—it stunk to high heaven. They might not—they probably would not—believe that he had died in the ruins of the palace, but they wouldn't *know* that he hadn't. And they would think that he hadn't found out a thing, and he would keep them thinking so as long as he could. The young thug in Cartiff's would help, too, all unconsciously. He would assume the name and station, of course, and fight with everything Kinnison had taught him. That *would* help—Kinnison grinned as he realized just how much it would help.

The real Cartiff would have to vanish as completely, as absolutely without a trace as was humanly possible. They would, of course, figure out in time that Cartiff had done whatever was done in the palace, but it was up to him to see to it that they could never find out how it was done. Wherefore he took from Menjo's mind every iota of knowledge which might conceivably be of use to him thereafter. Then Menjo Bleeko died. His corpse fell into a heap upon the floor and the Lensman strode along corridors and down stairways. And wherever he went, there Death went also.

This killing griped Kinnison to the core of his being, but it had to be. The fate of all Civilization might very well depend upon the completeness of his butchery this day; upon

the sheer mercilessness of his extermination of every foe who might be able to cast any light, however dim, upon what he had just done.

Straight to the palace arsenal he went, where he labored briefly at the filling of a bin with bombs. A minute more to set a timer and he was done. Out of the building he ran. No one stayed him; nor did any, later, say that they had seen him go. He dumped a dead man out of a car and drove it away at reckless speed. Even at that, however, he was almost too slow—hurting stones from the dynamited palace showered down scarcely a hundred feet behind his screeching wheels.

He headed for the spaceport; then, changing his mind, braked savagely as he sent Lensed instructions to Watson. He felt no compunction about fracturing the rules and regulations made and provided for the landing of spaceships at spaceports everywhere by having his vessel make a hot blast, unauthorized, and quite possibly highly destructive landing to pick him up. Nor did he fear pursuit. The big shots were, for the most part, dead; the survivors and the middle-sized shots were too busy by far to waste time over an irregular incident at a spaceport. Hence nobody would give anybody any orders, and without explicit orders no Lonabarian officer would act. No, there would be no pursuit. But They—the Ones Kinnison was after—would interpret truly every such irregular incident; wherefore there must not be any.

Thus it came about that when the speeding ground car was upon an empty stretch of highway, with nothing in sight in any direction, a spaceship eased down upon muffled under jets directly above it. A tractor beam reached down; car and man



were drawn upward and into the vessel's hold. Kinnison did not want the car, but he could not leave it there. Since many cars had been blown out of existence with Bleeko's palace, for this one to disappear would be natural enough; but for it to be found abandoned out in the open country would be a highly irregular and an all too revealing occurrence.

Upward through atmosphere and stratosphere the black cruiser climbed; out into interstellar space she flashed. Then, while Watson coaxed the sleek flier to do even better than her prodigious best, Kinnison seated himself at the ultrabeam communicator and drilled a beam to Prime Base and Port Admiral Haynes.

"LENS to Lens, chief, please," Kinnison cautioned, when the handsome old face, surmounted now by a shock of bushy gray hair, appeared upon his plate. "Didn't want to interrupt anything important, is why I called you through the office instead of direct."

"You always have the right of way, Kim, you know that—you're the most important thing in the Galaxy right now," Haynes said, soberly.

"Well, a minute or so wouldn't make any difference—not *that* much difference, anyway," Kinnison replied, uncomfortably. "I don't like to Lens you unless I have to," and he began his report.

Scarcely had he started, however, when he felt a call impinge upon his own Lens. Clarrissa was calling him from Lyrane II.

"Just a sec, admiral!" he thought, rapidly. "Come in, Chris—make it a three-way with Admiral Haynes!"

"You told me to report anything

unusual, no matter what," the girl began. "Well, I finally managed to get almost chummy with Helen, and absolutely the only unusual thing I can find out about the whole planet or race is that the death rate from airplane crashes began to go up awhile ago and is still rising. I don't see how that fact can have any bearing, but am reporting it as per instructions."

"Hm-m-m. What kind of crashes?" Kinnison asked.

"That's the unusual feature of it. Nobody knows—they just disappear."

"WHAT?" Kinnison yelled the thought, so forcibly that both Clarrissa and Haynes winced under its impact.

"Why, yes," she replied, innocently. "But I don't see yet that it means—"

"It means that you *do*, right now, crawl into the deepest, most heavily thought-screened hole in Lyrane and stay there until I, personally, come and dig you out," he replied, grimly. "It means, admiral, that I want Worsel and Tregonsee as fast as I can get them—not orders, of course, but very, *very* urgent requests. And I want Van Buskirk and his gang of Valerians, and Grand Fleet, with all the trimmings, within easy striking distance of Dunstan's Region as fast as you can possibly get them there. And I want—"

"Why all the excitement, Kim?" and "What do you know, son?" The two interruptions came almost as one.

"I don't *know* anything." Kinnison emphasized the verb very strongly. "However, I suspect a lot. Everything, in fact, grading downward from the Eich."

"But they were all destroyed, weren't they?" the girl protested.

"Far from it." This from Haynes.





"Would the destruction of Tellus do away with all mankind? I am beginning to think that the Eich are to Boskonian exactly what we are to Civilization."

"So am I," Kinnison agreed. "And, such being the case, will you please get hold of Nadreck of Palain VII for me? I don't know his pattern well enough to Lens him from here."

"Why?" Clarrissa asked, curiously.

"Because he's a frigid, poison-

breathing second stage Gray Lensman," Kinnison explained. "As such he is much closer to the Eich, in every respect, than we are, and may very well have an angle that we haven't." And in a few minutes the Palainian Lensman became *en rapport* with the group.

"An interesting development, truly," his soft thought came in almost wistfully when the status quo had been made clear to him. "I fear



greatly that I cannot be of any use, but I am not doing anything of importance at the moment and will be very glad indeed to give you whatever slight assistance may be possible to one of my small powers. I come at speed to Lyrane II."

## XI.

KINNISON had not underestimated the power and capacity of his as yet unknown opposition. Well it was for him and for his Patrol that he was learning to think; for, as has already been made clear, this phase of the conflict was not essentially one of physical combat. Material encounters did occur, it is true, but they were comparatively unimportant. Basically, fundamentally, it was brain against brain; the preliminary but nevertheless prodigious skirmishing of two minds—or, more accurately, two teams of minds—each trying, even while covering up its own tracks and traces, to get at and to annihilate the other.

Each had certain advantages.

Boskonian—although we know now that Boskone was by no means the prime mover in that dark culture which opposed Civilization so bitterly, nevertheless, "Boskonian" it was and still is being called—for a long time had the initiative, forcing the Patrol to wage an almost purely defensive fight. Boskonian knew vastly more about Civilization than Civilization knew about Boskonian. The latter, almost completely unknown, had all the advantages of stealth and of surprise; her forces could and did operate from undeterminable points against precisely plotted objectives. Boskonian had the hyperspatial tube long before the Conference of Scientists solved its mysteries; and even after the Patrol could use it, it could do Civiliza-

tion no good unless and until something could be found at which to aim it.

Upon the other hand, Civilization had the Lens. It had the backing of the Arisians; maddeningly incomplete and unsatisfactory though that backing seemed at times to be. It had a few entities, notably one Kimball Kinnison, who were learning to think really efficiently. Above all, it had a massed purpose, a loyalty, an *esprit de corps* backboning a morale which the whip-driven ranks of autocracy could never match and which the whip-wielding drivers could not even dimly understand.

Kinnison, then, with all the powers of his own mind and the minds of his friends and coworkers, sought to place and to identify the real key mentality at the destruction of which the mighty Boskonian Empire must begin to fall apart; that mentality, in turn, was trying with its every resource to find and to destroy the intellect which, pure reason showed, was the one factor which had enabled Civilization to throw the fast-conquering hordes of Boskonian back into their own galaxy.

Now, from our point of vantage in time and in space—through the vistas of years of time and of parsecs of space—we can study at leisure and in detail many things which Kimball Kinnison could only surmise and suspect and deduce. Thus, he knew definitely only the fact that the Boskonian organization did not collapse with the destruction of the planet Jarnevon.

We know now, however, all about the Thrallian solar system and about Alcon of Thrale, its unlamented tyrant. The planet Thrale—planetographically speaking, Thrallis II—so much like Tellus that its na-



tives, including the unspeakable Alcon, were human practically to the limit of classification; and about Onlo, or Thrallis IX, and its monstrous natives. We know now that the duties and the authorities of the Council of Boskone were taken over by Alcon of Thrale; we now know how, by reason of his absolute control over both the humanity of Thrale and the monstrosities of Onlo, he was able to carry on.

Unfortunately, like the Eich, the Onlonians simply cannot be described by or to man. This is, as is already more or less widely known, due to the fact that all such non-aqueous, subzero-blooded, nonoxygen-breathing peoples have of necessity a metabolic extension into the hyper dimension; a fact which makes even their three-dimensional aspect subtly incomprehensible to any strictly three-dimensional mind.

Not all such races, it may be said here, belonged to Boskonia. Many essentially similar ones, such as the natives of Palain VII, adhered to our culture from the very first. Indeed, it is held that sexual equality is the most important criterion of that which we know as Civilization. But, since this is not a biological treatise, this point is merely mentioned, not discussed.

The Onlonians, then, while not precisely describable to man, were very similar to the Eich—as similar, say, as a Posenian and a Tellurian are to each other in the perception of a Palainian. That is to say practically identical; for to the unknown and incomprehensible senses of those frigid beings the fact that the Posenian possesses four arms, eight hands, and no eyes at all, as compared with the Tellurian's simply paired members, constitutes a total difference so slight as to be negligible.

BUT TO RESUME the thread of history, we are at liberty to know things that Kinnison did not. Specifically, we may observe and hear a conference which tireless research has reconstructed *in toto*. The place was upon chill, dark Onlo, in a searingly cold room whose normal condition of utter darkness was barely ameliorated now by a dim blue glow. The time was just after Kinnison had left Lonabar for Lyrane II. The conferees were Alcon of Thrale and his Onlonian cabinet officers. The armor-clad Tyrant, in whose honor the feeble illumination was, lay at ease in a reclining chair; the pseudoreptilian monstrosities were sitting or standing in some obscure and inexplicable fashion at a long, low bench of stone.

"The fact is," one of the Onlonians was radiating harshly, "that our minions in the other galaxy could not or would not or simply did not think. For years things went so smoothly that no one had to think. The Great Plan, so carefully worked out, gave every promise of complete success. It was inevitable, it seemed, that that entire galaxy would be brought under our domination, its Patrol destroyed, before any inkling of our purpose could be perceived by the weaklings of humanity.

"The Plan took cognizance of every known factor of any importance. When, however, an unknown, unforeseeable factor, the Lens of the Patrol, became of real importance, that Plan, of course, broke down. Instantly, upon the recognition of an unconsidered factor, the Plan should have been revised. All action should have ceased until that factor had been evaluated and guarded against. But no—no one of our commanders in that galaxy or handling its affairs ever thought of such a thing—"

"It is you who are not thinking



now," the Tyrant of Thrale broke in. "If any underling had dared any such suggestion, you yourself would have been among the first to demand his elimination. The Plan should have been revised, it is true; but the fault does not lie with the underlings. Instead, it lies squarely with the Council of Boskone—by the way, I trust that those six of that council who escaped destruction upon Jarnevon by means of their hyperspatial tube have been dealt with?"

"They have been liquidated," another officer replied.

"It is well. They were supposed to think, and the fact that they neither coped with the situation nor called it to your attention until it was too late to mend matters, rather than any flaw inherent in the Plan, is what has brought about the present absolutely intolerable situation.

"Underlings are not supposed to think. They are supposed to report facts; and, if so requested, opinions and deductions. Our representatives there were well trained and skillful. They reported accurately, and that was all that was required of them. Helmuth reported truly, even though Boskone discredited his reports. So did Prellin, and Crowninshield, and Jalte. The Eich, however, failed in their duties of supervision and correlation; which is why their leaders have been punished and their operators have been reduced in rank—why we have assumed a task which, it might have been supposed and was supposed, lesser minds could have and should have performed.

"Let me caution you now that to underestimate a foe is a fatal error. Lan of the Eich prated largely upon this very point, but in the eventuality he did, in fact, underestimate very seriously the resources and the qualities of the Patrol; with what disastrous consequences we are all fa-

miliar. Instead of thinking, he attempted to subject a purely philosophical concept, the Lens, to a mathematical analysis. Neither did the heads of our military branch think at all deeply, or they would not have tried to attack Tellus until after this new and enigmatic factor had been resolved. Its expeditionary forces vanished without sign or signal—in spite of its primaries, its negative-matter bombs, its supposedly irresistible planets—and accursed Tellus still circles untouched about Sol, its sun. The condition is admittedly not to be borne; but I have always said, and I now do and shall insist, that no further action be taken until the Great Plan shall have been so revised as reasonably to take into account the Lens. What of Arisia?" he demanded of a third cabineteer.

"It is feared that nothing can be done about Arisia at present," that entity replied. "Expeditions have been sent, but they were dealt with as simply and as efficiently as were Lan and Amp of the Eich. Planets have also been sent, but they were detected by the Patrol and were knocked out by far-ranging dirigible planets of the enemy. However, I have concluded that Arisia, of and by itself, is not of prime immediate importance. It is true that the Lens did in all probability originate with the Arisians. It is hence true that the destruction of Arisia and its people would be highly desirable, in that it would insure that no more Lenses would be produced. Such destruction would not do away, however, with the myriads of the instruments which are already in use and whose wearers are operating so powerfully against us. Our most pressing business, it seems to me, is to hunt down and exterminate all Lensmen; particularly the one whom Jalte called



THE Lensman, who, Eichmil was informed by Lensman Morgan, was known to even other Lensmen only as Star A Star. In that connection, I am forced to wonder—is Star A Star in reality only one mind?”

“That question has been considered both by me and by your chief psychologist,” Alcon made answer. “Frankly, we do not know. We have not enough reliable data upon which to base a finding of fact. Nor does it matter in the least. Whether one or two or a thousand, we must find and we must slay until it is feasible to resume our orderly conquest of the universe. We must also work unremittingly upon a plan to abate the nuisance which is Arisia. Above all, we must see to it with the utmost diligence that no iota of information concerning us ever reaches any member of the Galactic Patrol. I do not want either of our worlds to become as Jarnevon now is.”

“Hear! Bravo! Nor I!” came a chorus of thoughts, interrupted by an emanation from one of the sparkling force-ball intergalactic communicators.

“YES? Alcon acknowledging,” the Tyrant took the call.

It was a zwilnik upon far Lonabar, reporting through Lyrane VIII everything that Cartiff had done. “I do not know—I have no idea—whether or not this matter is either unusual or important,” the observer concluded. “I would, however, rather report ten unimportant things than miss one which might later prove to have had significance.”

“Right. Report received,” and discussion raged. Was this affair actually what it appeared upon the surface to be, or was it another subtle piece of the work of that never - to - be - sufficiently - damned Lensman?

AST—4p

The observer was recalled. Orders were given and were carried out. Then, after it had been learned that Bleeko’s palace and every particle of its contents had been destroyed, that Cartiff had vanished utterly, and that nobody could be found upon the face of Lonabar who could throw any light whatever upon the manner or the time of his going; then, after it was too late to do anything about it, it was decided that this must have been the work of THE Lensman. And it was useless to storm or to rage. Such a happening could not have been reported sooner to so high an office. The routine events of a hundred million planets simply could not be reported, nor could they have been considered if they were. And since this Lensman never repeated—his acts were always different, alike only in that they were drably routine acts until their crashing finales—the Boskonian observers never had been and never would be able to report his activities in time.

“But he got nothing *this* time, I am certain of that,” the chief psychologist exulted.

“How can you be so sure?” Alcon snapped.

“Because Menjo Bleeko of Lonabar knew nothing whatever of our activities or of our organization except at such times as one of my men was in charge of his mind,” the scientist gloated. “I and my assistants know mental surgery as those crude hypnotists, the Eich, never will know it. Even our lowest agents are having those clumsy and untrustworthy false teeth removed as fast as my therapists can operate upon their minds.”

“Nevertheless, you are even now guilty of underestimating,” Alcon reproved him sharply, energizing a force-ball communicator. “It is



quite eminently possible that he who wrought so upon Lonabar may have been enabled—by pure chance, perhaps—to establish a linkage between that planet and Lyrane—”

The cold, crisply incisive thought of an Eich answered the Tyrant's call.

“Have you of Lyrane perceived or encountered any unusual occurrences or indications?” Alcon demanded.

“We have not.”

“Expect them, then,” and the Thrallian despot transmitted in detail all the new developments.

“We always expect new and untoward things,” the Eich more than half sneered. “We are prepared momentarily for anything that can happen, from a visitation by Star A Star and any or all of his Lensmen up to an attack by the massed Grand Fleet of the Galactic Patrol. Is there anything else, your supremacy?”

“No. I envy you your self-confidence and your assurance, but I mistrust exceedingly the soundness of your judgment. That is all.” Alcon turned his attention to the chief psychologist. “Have you operated upon the minds of those Eich and those self-styled Overlords as you did upon that of Menjo Bleeko?”

“No!” the mind surgeon gasped. “Impossible! Not physically, perhaps, but would not such a procedure interfere so seriously with the work that it—”

“That is your problem—solve it,” Alcon ordered, curtly. “See to it, however it is solved, that no traceable linkage exists between any of those minds and us. Any mind capable of thinking such thoughts as those which we have just received is not to be trusted.”

As has been said, Kinnison-ex-Cartiff was en route for Lyrane II while the foregoing conference was

taking place. Throughout the trip he kept in touch with Mac. At first he tried, with his every artifice of diplomacy, cajolery, and downright threats, to make her lay off; he finally invoked all his Unattached Lensman's transcendental authority and ordered her summarily to lay off.

No soap. How did he get that way, she wanted furiously to know, to be ordering her around as though she were an uncapped probe? She was a Lensman, too, by Klono's curly whiskers! She had a job to do and she was going to do it. She was on a definite assignment—his own assignment, too, remember—and she wasn't going to be called off of it just because he had found out all of a sudden that it might not be quite as safe as dunking doughnuts at a down-river picnic. What kind of a sun-baked, space-tempered crust did he have to pull a crack like that on *her*? Would he have the barefaced, unmitigated gall to spring a thing like that on any other Lensman in the whole cockeyed universe?

That stopped him—cold. Lensmen always went in; that was their code. For any Tellurian Lensman, anywhere, to duck or to dodge because of any possible personal danger was sheerly, starkly unthinkable. The fact that she was, to him, the sum total of all the femininity of the Galaxy could not be allowed any weight whatever; any more than the converse aspect had ever been permitted to sway him. Fair enough. Bitter, but inescapable. This was one—just one—of the consequences which Mentor had foreseen. He had foreseen it, too, in a dimly unreal sort of way, and now that it was here he'd simply have to take it. QX.

“But be careful, Chris, anyway,” he surrendered. “Awfully careful—as careful as I would myself.”



"I could be ever so much more careful than that and still be pretty reckless." Her low, entrancing chuckle came through as though she were present in person. "And by the way, Kim, did I ever tell you that I am fast getting to be a gray Lensman?"

"You always were, ace—you couldn't very well be anything else."

"No—I mean actually gray. Did you ever stop to consider what the laundry problem would be upon this heathenish planet?"

"Chris, I'm surprised at you—what do you need of a laundry?" he derided her, affectionately. "Here you've been blasting me to a cinder about not taking your Lensmanship seriously enough, and yet you are violating one of the prime tenets—that of conformation to planetary customs. Shame on you!"

He felt her hot blush across all those parsecs of empty space. "I tried it at first, Kim, but it was just simply *terrible!*"

"You've got to learn how to be a Lensman or else quit throwing your weight around like you did a while back. No back chat, either, you insubordinate young jade, or I'll take that Lens away from you and heave you into the clink."

"You and what regiment of Valerians? Besides, it didn't make any difference," she explained, triumphantly. "These matriarchs don't like me one bit better, no matter what I wear or don't wear."

Time passed, and in spite of Kinnison's highly disquieting fears, nothing happened. Right on schedule the Patrol ship eased down to a landing at the edge of the Lyranian airport. Mac was waiting; dressed now, not in nurse's white, but in startlingly nondescript gray shirt and breeches.

"Not the gray leather of my station, but merely dirt color," she ex-

plained to Kinnison after the first fervent greetings. "These women are clean enough physically, but I simply haven't got a thing fit to wear. Is your laundry working?"

It was, and very shortly Sector Chief Nurse Clarrissa MacDougall appeared in her wonted immaculately white stiffly starched uniform. She did not, then or ever, wear the gray to which she was entitled; nor did she ever—except when defying Kinnison—lay claims to any of the rights or privileges which were so indubitably hers. She was not, never had been, and never would or could be a *real* Lensman, she always did insist. At best, she was only a synthetic—or an imitation—or a sort of an amateur—or maybe a "Red" Lensman—handy to have around, perhaps, for certain kinds of jobs, but absolutely and definitely not a regular Lensman. And it was this attitude which was to make the Red Lensman not merely tolerated, but loved as she was loved by Lensmen, Patrolmen, and civilians alike throughout the length, breadth, and thickness of Civilization's bounds.

THE SHIP lifted from the airport and went north into the uninhabited temperate zone. The matriarchs did not have a thing which the Tellurians either needed or wanted; the Lyranians disliked the visitors so openly and so intensely that to move away from the populated belt was the only logical and considerate thing to do.

The *Dauntless* arrived a day later, bringing Worsel and Tregonsee; followed closely by Nadreck in his ultrarefrigerated speedster. Five Lensmen, then, studied intently a globular map of Lyrane II which Clarrissa had made. Four of them, the oxygen breathers, surrounded it in the flesh, while Nadreck was with them only in essence. Physically he was



far out in the comfortably subzero reaches of the stratosphere, but his mind was *en rapport* with theirs; his sense of perception scanned the markings upon the globe as carefully and as accurately as did theirs.

"This belt which I have colored pink," Mac explained, "corresponding roughly to the torrid zone, is the inhabited area of Lyrane II. Nobody lives anywhere else. Upon it I have charted every unexplained disappearance that I have been able to find out about. Each of these black crosses is where one such person lived. The black circle—or circles, for frequently there are more than one—connected to each cross by a black line, marks the spot—or spots—where that person was seen for the last time or times. If the black circle is around the cross, it means that she was last seen at home. I'm sorry that I couldn't get any real information; that this jumble is all that I could discover for you."

The crosses were distributed fairly evenly all around the globe and throughout the populated zone. The circles, however, tended markedly to concentrate upon the northern edge of that zone; and practically all of the encircled crosses were very close to the northern edge of the populated belt. To four of the Lensmen present the full grisly meaning of the thing was starkly plain.

Nadreck was the first to speak. "Ah, very well done, Lensman MacDougall," he congratulated. "Your data are amply sufficient. A right scholarly and highly informative bit of work, eh, friend Worsel?"

"It is so—it is indeed so," the Valantian agreed, the while a shudder rippled along the thirty-foot length of his sinuous body. "I sus-

pected many things, but not this—certainly not this, ever, away out here."

"Nor I." Tregonsee's four horn-lipped, toothless mouths snapped open and shut; his cabled arms writhed in detestation.

"Nor I," from Kinnison. "If I had, I'd've had a hundred Lyranians mob you, Chris, and tie you down. It would be just about here, I'd say, from the trend of the lines of vanishment." He placed a fingertip near the north pole of the globe. He thought for a moment, his jaw setting and his eyes growing hard, then spoke aloud to the girl. "Chris, the next time I tell you to hide and you don't do it I'm going to take that Lens away from you and flash it with a DeLameter—then you'll go back to Tellus and you'll stay there." His voice was grimmer than she had ever before heard it.

"You don't mean . . . why, it can't be . . . you're all thinking . . . Overlords!" she gasped. Her face turned white; both hands flew to her throat.

"Just that. Overlords. Nothing else but." He pictured in imagination his fiancée's body writhing in torment upon a Delgonian torture screen until his mind revolted; all unconscious that his thoughts were as clear as a telescreen picture to all the others. "If they had detected *you*— You know that they would do anything to get hold of a mind and a vital force like yours— But, thank all the gods of space, they didn't." He shook himself and drew a tremendously deep breath of relief. "Well, all I've got to say is that if we ever have any kids and they don't bawl when I tell them about this, I'll certainly give them something to bawl about!"



# IN TIMES TO COME

BECAUSE it takes a lifetime to really learn how to handle the complexities of an executive job, it's only natural that executives in any form or type of government or society will try to maintain things as they are. Naturally—for in things-as-they-are, those executives have immensely valuable lifelong training. In a state of things-as-they-might-be, that hard-won training is valueless. When major changes come, therefore, there's a strong tendency for them to come violently, to come from guns and high explosives—

That's the background of Jack Williamson's novelette of a changing order next month. "Breakdown" deals with the time when interplanetary travel, economics based on interplanetary travel, has reached its limits and is suffering hardening of the intellect. And when the beginnings of something new and strange is being pressed down—concealed—and made explosive! It's the tale of a strong-arm labor boss who ruled the System—and watched the System explode in his face, watched his mighty ruling city crumble under the blows of titanic guns in space—

There are short stories coming, too, of course. And there's Part III of "Second Stage Lensmen." I'll repeat that experience shows the issues carrying Doc Smith stories can't be obtained later if you miss them now.

Furthermore—that January issue will be the first of Astounding's new, large-size issues—see the Editor's Page if you haven't already—and for that reason, too, not one to miss!

THE EDITOR.

## ANALYTICAL LABORATORY

It is our most earnest desire that every yarn published in Astounding, and every issue of the magazine, be better than any previously done. It is the ardent desire of every author that his each succeeding yarn be better than any he's done before, and better than any anyone has done before.

Being human, though, it is generally a case of trying rather than succeeding. The effort is genuine; that much I can guarantee in any case. Once in a while, naturally, authors and editor both attain that goal, apparently. From the reader reactions, we did it with the October Astounding; it brought in nearly twice the usual number of letters, and several times the intensity of pleasant glow of praise.

Of course, that means it's going to be that much tougher to get another spontaneous reaction of praise. We're always judged by the best, naturally, not the average.

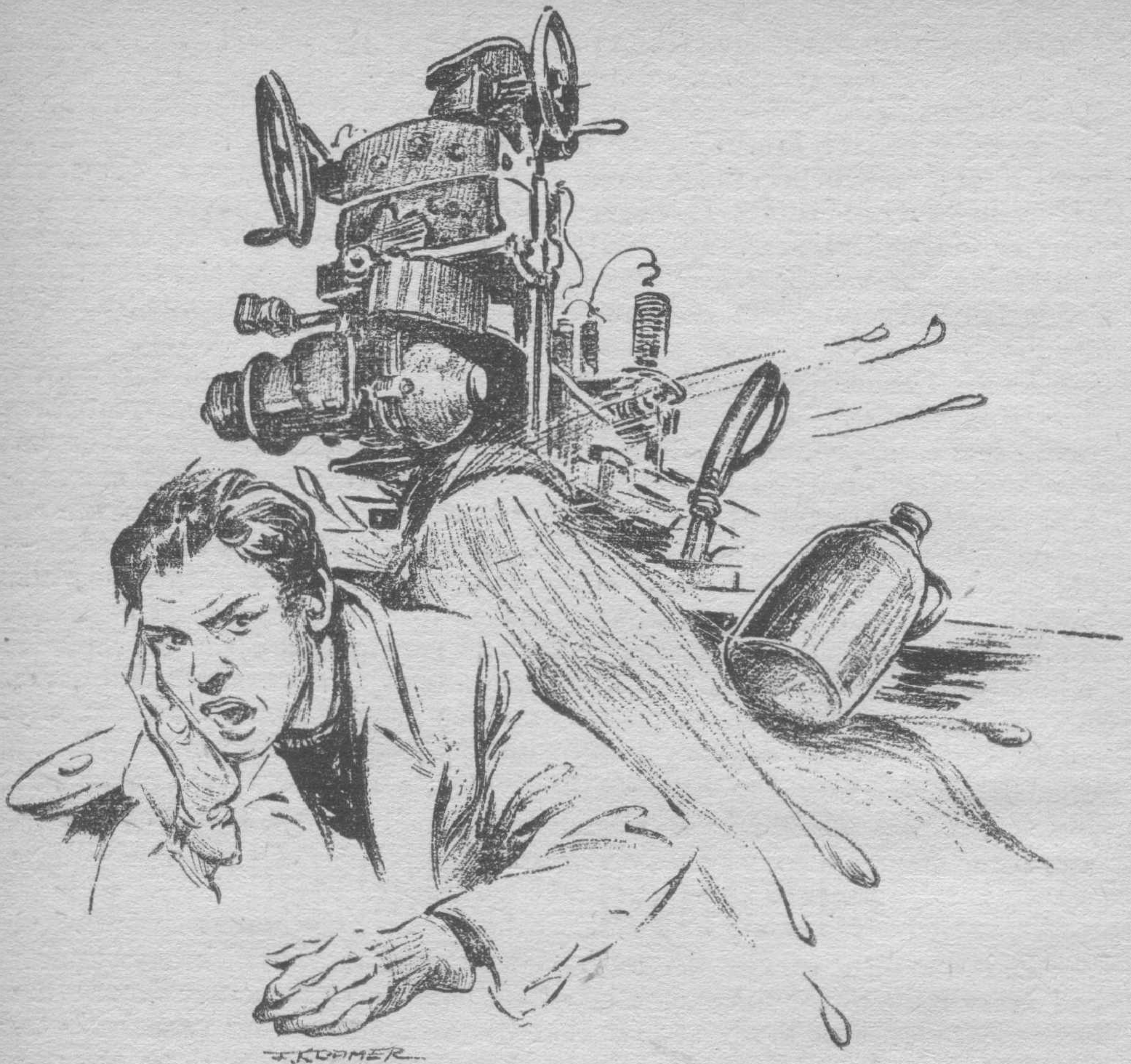
But thankee kindly. We'll try, anyway.

The results read as follows:

<i>Place</i>	<i>Story</i>	<i>Author</i>	<i>Points</i>
1.	By His Bootstraps	Anson MacDonald	1.5
2.	Common Sense	Robert Heinlein	1.65
3.	Not Final!	Isaac Asimov	2.7
4.	Two Percent Inspiration	Theodore Sturgeon	4.0
5.	Manic Perverse	Winston K. Marks	4.5

THE EDITOR.





# THE SORCERER'S APPRENTICE

by Colin Keith

*The Sorcerer—the greatest scientist of his age—wanted a glass of water. He had a lazy apprentice. Now, the apprentice had an idea to save himself work, unfortunately—*

Illustrated by Kramer

SOMETIMES the simplest and most reasonable request brings astonishing results.

The fiasco at the big No. 1 Plant atop Pikes Peak began like this.

"Hoskins," said the man known the world over as The Sorcerer, turning from the empty water cooler, "will you pick up the phone please and call the storeroom down at the



ten-thousand-foot level and ask them to send up a bottle of mineral water? This one is dry."

"Yes, sir," said Hoskins, obediently, and began flicking the number. He clicked impatiently several times, then announced, "The phone's dead."

"That's so," agreed The Sorcerer. "I forgot. They are having some trouble in No. 31 Distribution Station. The phones may be out for another hour. But I'm thirsty as hell. Won't you hop on the elevator, like a good boy, and drop down and bring up one yourself?"

"Y-yes, sir," acknowledged Hoskins, reluctantly. He was the junior-most of the six young scientists honored with the appointment of being understudies to the foremost scientist of all time. It griped him to be asked to do what he regarded as menial things. It was not fitting to his august position. But he shoved away the mass of formulas he was working on and got grudgingly to his feet. With just a show of sulking—enough to be unmistakable, yet discreet—he slouched toward the door.

"Dumb egg, that," whispered Bob Hallet to Freddie Palmer, next to him. "How in the name of Einstein did he ever get this far?"

"Sh-h-h," cautioned Palmer. "Didn't you know? He's Sol Hoskins' nephew—"

"You mean the General Director of Production at Washington? *Oh!*"

And that is the end of that scene. Nearly an hour later The Sorcerer rose, stretched and yawned.

"Well, boys," he called, "let's call it half a day and drop down to the Quick-and-Dirty and snatch a bite of chow. Looks as if the kid fell down the shaft or something."

The other five young men slid their papers together and rose, de-

lighted at the invitation for a recess. Their chief was a difficult man in many respects. He was a hound for work and no respecter of hours. Moreover, he expected his whole staff to work with him, minute for minute. Often stretches of as long as fifteen and twenty hours occurred without the slightest break. Today the chief seemed unusually genial and relaxed. They followed him respectfully down the corridor to the western bank of elevators. In a moment they would be down at the six-thousand-foot level and would climb into a subway car bound for the officers' restaurant in Manitou. They had no way of knowing whether they would be there five minutes or three hours, for the chief might be in one of his rare talkative moods. Again, he might be seized with a new idea even as he was ordering the meal, and drag them back again on the run to their desks. Being understudy to The Sorcerer had its points, but not all of them were good.

That day, though, The Sorcerer was in an expansive mood and they had a good lunch and dawdled long over it. He told his helpers many things about himself that they only partially knew from common rumor.

Christened Algernon Leroy Sillywood, he had never cared for the name. Instead, he let people call him Bucky. It was not until he had unearthed and deciphered the cryptic formula left behind by Einstein that he became to be known universally as The Sorcerer. He was a spare man, just turned forty, with a bronzed skin and a manelike head of iron-gray hair. In his youth he had been a civil engineer, but he had the rare quality of combining both practical common sense and the most ethereal and far-flung imaginative mathematical mind. That accounted



for his double miracle. First he had comprehended that single line of mystical symbols penned by Einstein in his declining years in which was stated the ultimate formula that binds space, time, gravity and all the electrical phenomena together. On top of that, he had been able to apply them to practical use.

He was called The Sorcerer for good reason, although he in no way resembled the picture favored by illustrators of weird stories. He dealt with interstellar and interplanetary forces. He dealt with the marvelous alchemy of transmutation of the elements. The marriage of those two dealings was perfectly expressed in the great No. 1 Plant atop Pikes Peak. There it was that all the continent's—most of the world's, for that matter—raw materials were produced. It mattered not in the least what was asked for—gold, diamonds of any size, hay, or helium gas. He could turn it out by the ton per second. The beautiful thing about it was that it all came out of thin air, and those who have clawed their way up the Peak on hand and foot know how exceedingly thin that air becomes just before the summit is reached.

But that day he sat late at the table and told his disciples how he had first thought of the analogy between a rotating, revolving planet and the armature of a big electric generator. He explained briefly the field of gravitic lines of force extending between all the heavenly bodies, and spoke of the terrific magnitude of those forces, and of how they could be tapped to yield undreamed-of power and yet not be diminished appreciably.

"They wasted time for years," he said, "with cyclotrons and such crude implements, trying to disintegrate

the atom. They succeeded, but the input of power needed was so much greater than the value of the results obtained that it simply didn't pay. I saw at once that we were putting the cart before the horse. What we wanted to do was *integrate* the atom—assemble it, working from fairly simple elements. That needs power, too, but with the Einstein formula as a guide, we found scads of power. Up there on the hill we drag down billions of horsepower per second and could have a thousand times that much if we chose to utilize it. But we need no more than we take now—"

A frightened waiter ran into the room. He swirled to a pause in the center of the floor.

"Ladees and gen'lemen," he called, "keep calm, just a moment, please. There is a bad flood outside. You had all better go up onto the roof. The management is taking what steps it can."

The Sorcerer raised his eyebrows and looked about him at his subordinates. It was still very early summer and the canyon streams had not begun to run very strong. Where would a flood be coming from at this season?

"Let's go to the window and look," he suggested calmly, placing his napkin on the table and shoving back his chair.

What they saw from the window was breath-taking. The street was filled with a rushing torrent of clear mountain water, flooding out of the narrow canyon just above the town. Lamp-posts stood sturdily for a moment, then leaned over like reeds and disappeared beneath the waves. It was rising visibly, foot by foot, and flowing swiftly in the extreme. A small bungalow came by, turning slowly over and over. The heads of



frantic swimmers could be glimpsed, battling the current.

"What the hell," said The Sorcerer, dryly, "do you suppose is going on up the hill?"

THERE WAS plenty going on up the hill, as he so disparagingly referred to the majestic peak above them. To understand just what, perhaps it would be best to go back to Mr. Hoskins and his errand.

He went first to the eastern bank of elevators that led down into the bowels of the mountain. They were as dead as the phones and he recalled then that their power came through the substation that was in trouble. He looked at the door leading to the emergency stairs and sighed. It was close to half a mile straight down to where he had to go—a fearful climb, especially coming back with a five-gallon bottle of water on the shoulder. Yet when The Sorcerer sent a man for a thing, it was not wise for that man to go back without it. The one thing the chief was *not* interested in was excuses.

Hoskins sighed again, but there seemed to be no way out for him. He drew the door open and began the long descent. Two levels below, though, a happy idea seized him, and with leaps and bounds he went back up the flights he had just descended. There were other ways of getting water.

He ran back along the corridor until he came to the set of elevators to the south—the ones that led to the summit, where the control room was located and the vast intake blowers. Those, he found to his immense delight, were working. A moment later he stepped out onto the vast gallery that housed the gigantic atomic converters and walked down

the aisle between rows of them, hearing the monotonous drone of their humming as the indrawn nitrogen and oxygen atoms underwent their magical transformation into a myriad of more complex substances more urgently wanted by man. Before tackling the short circular staircase that led upward to The Sorcerer's private laboratory above, he paused for a moment to get his breath, and leaned across the sill of the casemate cut through the face of the living rock.

The view from that point always possessed grandeur, but now that man had wholly pre-empted the rock, its interest was even greater. For the upland valleys far below, that once had held nothing but useless lakes of icy water and a few scraggy pines, now teemed with industry. Everywhere fabricating plants sprawled, putting the finishing touches to the raw materials being constantly fed them by the plant above.

The mountain itself, viewed from afar, appeared as a pinnacle upon which a giant octopus had fastened. In that conception the control house at the summit and the immense intakes formed the body, while the seemingly clinging tentacles that straggled down the Peak's flanks in all directions were explained by the fact that they were the tremendous penstocklike conveyors by which the newly created molecules were delivered to the waiting factories below.

For example, to Hoskins' right was a throbbing tube a hundred feet in diameter down which nascent molecules of vanadium steel were being swirled. At a certain level below these would condense into an impalpable powder and fall eventually into a hopper in the steel mill beneath. There men would fuse the



powder in electric furnaces and then roll it to whatever shape was desired. The corresponding tube to the left was palpitating with newborn cellulose particles which would fall into the bins of the textile mills as long silky fibers of great strength, needing only to be spun into strong, durable thread, and then woven.

Other tubes which he could not see were delivering other products, such as the one which continually carried a stream of a rich mixture of hydrocarbons to the storage tanks far down the valley—aviation gas, correct to the last tiny fraction. There was the one spouting gold dust, which had many uses. Roofs, storage tanks and ships did not rust so readily when plated with the inert stuff. Hoskins knew all that, for he had been in the plant for more than a year.

He got his breath, then clambered up to the next level, where the operating panels were set. Above each converting element stood its own switchboard, studded with many tiny knobs and volume indicators. He also knew what those were. Each knob stood for an element, and where desirable, another for each isotope of that element. The verniers controlled the percentage, so that it was possible to set up on the board the right combination of controls for the most complicated organic chemical. Rheostats regulated the volume, and automatic cut-offs were provided to stop production the moment the required tonnage had been run through.

He went past those, too, without stopping, until he came to the ladder that was the end of his short climb. At its top was the little office used only by the chief and his six closest assistants. Hoskins, naturally, had the key to it.

"Gee whiz!" he exclaimed, as he stepped into the door. The bottle which stood in the chief's sanctum and which should have been full or nearly so, was as empty as the one in the lower office. The porter had fallen down on the job. Hoskins' hopes of swiping this one and carrying it down were dashed. And there was no substitute that the chief would accept. He would have to go down to the storeroom after all.

Then his eye fell on the label. There it was stated in very exact percentages just what it was that gave the water the particular tang that made The Sorcerer demand it. It had iron, it had sulphur, it had several bitter chlorides and a pair of obscure phosphates in it. But there it was, the whole formula.

HOSKINS had another of his sudden and not too brilliant inspirations. He shifted his disgusted glance to the little model machine that had been The Sorcerer's first successful converter. He had kept it installed in this private study for sentimental reasons. Hoskins looked at it again, and suddenly his face cracked into a smile.

"Why, sure," he told himself. "I'll make the stuff. Why not?"

He turned to the control board—the only one in the room. He studied its maze of dials and knobs. Then he began setting them to match the formula derived from the chemical analysis of the spring water. As soon as they were all set, he up-ended the bottle and set it under the delivery end of the small machine. Then he went back and threw the switch.

There was a flicker as the lights momentarily dimmed, and the impassive board began to groan as the cosmic power surged through it. But



not a drop of water came from the little converter on the floor. Hoskins doubled the power, then trebled it. Still nothing happened.

"Ah," he said, comprehending at last what he had failed to do. Someone had broken the connection between the machine and the board. He pushed the switch in and went over and held his bottle. In a second now there would be water. He would not have to go to the storeroom after all.

Yes. He got water.

The reducer at the delivery end of the miniature machine blew off with a cannonlike roar and Hoskins knew vaguely that the bottle he had been holding an instant before had gone somewhere else. And as the edge of the three-foot cylinder of gushing water caught him and shot him out the door, he knew he had gone somewhere else, too. He was dizzily aware of going over Niagara and making a parabola in midair, only to come up hard on the floor plates of the operating deck below. Torrents of clear spring water were pouring out the door above him, and but for their force, he might have been drowned. But the volume and pressure were so great that the sideways push of it slid him out from under and tumbled him across the floor. He staggered to his feet a good twenty yards away, and found himself ankle-deep in fast-running water.

Hoskins was scared by then. He knew he had done something wrong. He wanted to get back there and open that switch, or at least cut down the power. But he saw at a glance that that was out. A solid stream of water against which no man could hope to stand was gushing from the laboratory door and splashing to the control floor below.

"Oh, golly," moaned poor Hoskins, "I've played hell now. I guess I'd better tell the chief."

So he sloshed along and waded his way to the circular staircase, which was by then a spectacular spiral cascade. But he clung to its handrail and got down to the level where the casemate was. The water was not deep there, so far, and the going was better. He made the elevator, very wet and very shaken, but he made it. He hoped devoutly all the way down that the stuff then raining down the shaft would not short the motors at the bottom before he could get to his floor.

But there he was to be disappointed again. The Sorcerer had gone to lunch and taken all his associates with him. A note left on the desk told him so. So Hoskins went back to the elevator and listened miserably to the falling water a moment. Then he ran as fast as his legs could carry him to the eastern bank. He was panting like a dog when he emerged at the Manitou end of the tunnel. What he saw there did not encourage him.

"Oh, golly," he reiterated, when he saw the raging flood that separated him from his chief.

"There's a freshet or something," remarked the doorman, looking out upon a town awash.

"Yeah, something," mumbled Hoskins, miserably. "Where's the nearest place I can get a boat?"

The doorman scratched his head. He had never been asked such a question before.

"Galveston, I reckon—this is the Rocky Mountains, you know. If you're figuring on getting down to the club, I'd say the best way was to swim."

Hoskins sat down and began taking his shoes off. It was going to



be terrible, but he had to face the music.

IF HOSKINS had known the whole of it, he might not have kept up his swimming so strenuously. In his mortification at realizing the full enormity of what he had done, he might have ducked his head and taken one deep breath of the water he had so abundantly created and thereby ended it all as far as he was concerned. For unbeknownst to him, that panel that stood in the chief's laboratory controlled every converter in the Peak. When actuated, its forces jumped the set-up on other boards, and put all the machines to work on the same product. Once a raging forest fire had suggested the idea to The Sorcerer. Should the mountainside burn again, instead of losing several plants as they had done the time before, it would be easy to cut all production and flood the lower valley with CO<sub>2</sub>.

Consequently, when Hoskins set up the mineral-water formula and threw in the switch, the converters just below were shunted over to a new schedule of production. They canceled whatever they were doing and began to produce water. He did not know that, for he was looking at the small experimental machine in the room with him, and that one formed no part in the general hookup. When he finally connected it with the others, he got his water, but more of it than he had bargained for, since in the meantime he had sextupled the power. It flung him out of the room and started him on his long shoot-the-chutes to find his boss, quite innocent of what was happening in the fabricating establishments below.

In the steel mill, for example, the superintendent of the watch hap-

pened to be standing near the outfall of the great delivery tube at the time Hoskins closed the master switch. He was observing the operation of the intricate system of conveyor belts that caught the downpour of silvery powder and distributed it to the rows of continuous electric furnaces that reached down the length of the bay, when he was suddenly flabbergasted at being hurled from the platform by the avalanche of clear water that rushed out upon him. Eventually he found his feet in the swirling torrent that spread out on the ingot-handling floor below, only to see the furnaces flash blue flame to the tune of a thunderous crash as the short-circuiting liquid flowed in between the points of their electrodes.

An astonished craneman, on the point of picking up a dazzling ingot mold, just filled to overflowing, was aghast to see a torrent of water pour down upon it. Instantly he was clawing for breath as clouds of upsurging steam filled all space, and for a long time after that he did not know what was happening. The flood rushed on and tumbled down the incline to the next level, where the rolling mills were. Traveling lines of white-hot ingots reddened and disappeared from sight under the all-pervading steam. The lights went out. After that, unadulterated pandemonium reigned.

The chief forelady in the great automatic textile mill had as rough an experience. She was standing by the carders, seeing how they sorted and laid side by side the fluffy fibers being fed down from above. What happened next she never knew, except that she found herself swimming frantically and snatching at the wet, clingy, mosslike stuff that kept getting into her nostrils. She saw the endless rows of whirling spindles flash by as she was borne



through them by the irresistible torrent. She was hurled through a door into the weaving department, where the flood spread out so that she battered her knees against the hard pavement each time it rolled her over. She grabbed at a clacking loom just as she was about to be swept past it and managed to clamber to her feet. She did not look back, but splashed along through calf-deep swift water until she reached the outer door. There she gave one thankful yelp and began clawing for high ground.

Over at the gasoline plant the scene was slightly different. They were used to handling liquids there, and the superficial differences between high-test gasoline and spring water are not startling. Yet the head gauger knew at once that something had gone screwy.

"Look, Joe," he called to his helper. "What do you make of this gravity reading? And the stuff don't smell. What do you think?"

Joe looked and Joe sniffed.

"I think," he drawled, after long consideration, "that somebody 'up there' has pulled a boner. The stuff's water."

"Shut the main gate, then," snapped the gauger. "I'll give 'em a buzz and raise hell with 'em. I've always wanted to get something on 'em, and here it is."

Joe reached for the button that operated the motor that drove the huge gate valve that would shut off the feeder. The motor groaned and did its work; the valve closed. But the huge penstock was designed to carry running gasoline, not water, nor had its builders meant it to be used as a standpipe. A six-thousand-foot head of water develops an appreciable static pressure. As more and more was fed down into the same confined space the in-

evitable happened—the colossal pipe split from end to end with a cracking boom that sounded like the roar of doom. Hundreds of thousands of tons of water squirted out onto the mountainside and a moment later were leaping down the slope carrying an avalanche of granite debris and boulders on every side.

"Scram!" warned the gauger, and the pair abandoned their posts without ceremony. Twenty minutes later they were safe in the top of a tall spruce, miles below, staring down at the torrent that swept beneath them.

"Yeah," agreed the gauger, belatedly, shifting his hold on the swaying branch. "You're right. Somebody pulled a boner. It's not only the wrong kind, but too much."

"Uh, huh," nodded Joe.

So it went elsewhere. The canyons flanking Pikes Peak spouted water and more water, and ever more water. Borne on the tumultuous surface of it was the wreckage of the fabricating plants.

THOSE BY-PRODUCTS of his efforts to refill a water bottle were unknown to Hoskins as the current swept him by the officers' club in Manitou. He only knew that what had formerly been a six-story building now appeared to be but two, and that its flat roof was jammed with people, all looking anxiously up at the Peak, from whose every casemate and orifice water was spouting. He summoned up his last reserve of wind and struck out into the backwater eddying downstream from the building. A moment later he was dragging his wet and bedraggled form over the sill of a fourth-floor window. It happened to be the window of the manager's office. The Sorcerer was at the radiophone. Hoskins lay limp



and panting for a few minutes just where he fell.

"But, governor," The Sorcerer was saying, "you can't do that. It's all very well to say that our plant has gone crazy. I know it. I'm thinking about the Arkansas River bridges, too, and the general sodden nature of this part of your State, but if you go through with that idea of getting up long-range railway batteries and using army bombers, you won't have any State under you to worry about. All there'll be will be a crater extending from Salt Lake City over into the middle of Kansas. There is power undreamed of flowing into that mountain and all that is needed to set it off is to have one of your dumb bombers hit the right spot—"

(Sputterings from the regional governor in Denver.)

"I know, I know," broke in The Sorcerer, "but hold your horses. Let me have a chance first. How about sending me over one of those helicopters? There is no other way I can see to get up there. Yes? O. K., I'll wait for it."

The Sorcerer broke the connection and wheeled. It was then he saw the dripping figure of his sixth assistant, sitting miserably by the window.

"Well," he snapped, "what's the story? I sent you for water. I see we have some. What did you do—step by step?"

Shamefaced and hangdog, Hoskins told him, with much stammering and attempts at self-excuse.

"Ah," said The Sorcerer, "so I suspected."

He glowered at the boy a moment, then turned and walked out. It was no time for recriminations. The water was already over the dam, so to speak. He went to the roof, his abject and repentant assistant fol-

lowing. Hoskins knew that sooner or later the lightning would strike—he might as well play the man as best he could about it, for there was no escape. Meanwhile, The Sorcerer paced the roof, his jaws set grimly, and alternately studying the gushing heights and the skies to the northward. Eventually, the helicopter came.

"Come on, you fellows," ordered The Sorcerer, "hop in with me."

Even the sniffling black sheep followed.

THEY GOT OUT on the topmost roof. The Sorcerer began barking orders.

"You, Palmer—take a couple of helpers and climb down the slope there and break that cosmic-power connection. Hallet! Take Wilson with you and shut off those air-intake motors. You will find the board in that turret over there—the square one. I'll go down and try to get to the master switch."

He lifted a hatch and stared down at the swirling flood that filled even the uppermost levels of the vast building. It was dark and forbidding down there, but the flood must stop. The Sorcerer shed his clothes, then went down the ladder, rung by rung.

He fought his way through the raging, surging waters until he found the door to his laboratory whence they came. There was a little space overhead, and he managed to get through. He swam to where he knew the switchboard was. There he held his breath and dived. His hand found the master switch and pulled it open. Intra-cosmic gravitic power is unlike electric current. Immersion in water does not short-circuit it; it augments it.

He rose to the surface and waited, hanging on to the edge of the panel



as the residual waters gurgled out of the room. Being the highest spot on the Peak, it soon drained. The Sorcerer watched it go until there was a bare few inches left. Then he waded back to the ladder, leaving the now barely dripping converter behind him. With quick pulls of the arms and legs he mounted to the roof where his thoroughly terrified disciple awaited him. He threw him one stony glance, then strode to the parapet, naked as he was, and studied the terrain beneath. Water had already ceased to spurt from the upper casemates, and the flow lower down was abating rapidly. The Sorcerer watched the lessening flood a moment, thinking all the while about his assistant, Hoskins. After all, the fellow was hardly more than a kid, and the damage done was irremediable. Moreover, The Sorcerer was an intensely practical man—Hoskins, whatever he was, was the favorite nephew of the most powerful politician in the country, the man who made and broke chief engineers. But it was not cynical

compromise with practical necessity half as much as the sheer inadequacy of any effort at punishment or at securing retribution that in the end decided The Sorcerer upon his course.

He straightened up and turned, beckoning Hoskins to come to him. The boy came over, expecting the worst.

"By the way, Hoskins," remarked The Sorcerer, most casually, "I suppose that after this you will be wanting to get out of the molecular-conversion game, and go back to your folks at Washington?"

"Yes, sir," agreed Hoskins, with a readiness that was pathetic.

"So. Well, my boy, let me give you a rule to remember. The next time someone asks you to bring him five gallons of water, bring him that—neither more nor less. Overdoing a thing is often as bad a fault as failing to do it altogether. Do you understand?"

"Yes, sir," said Hoskins, meekly, "I think I can remember that."

THE END.

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# BULLARD REFLECTS

by Malcolm Jameson

**Commander Bullard had a team nicely trained in a harmless sport—but it turned out he also had a team well-trained in the dangerous sport of outlaw busting!**

Illustrated by Kramer

“WHEE! Yippee! Yow!”

The crowd went crazy. Staid, gold-braided captains and commanders jumped up and down on their seats and yelled themselves hoarse. Even the admirals present dropped their dignified hand clapping for unrestrained shouting. Spacemen of all ratings tossed their hats away, hugged whoever was next to them, and behaved generally like wild men. Alan MacKay had scored his tenth successive goal!

“Castor Beans, Castor Beans—waw! waw! waw!” went the *Pollux* bleachers derisively.

“Polliwogs, Polliwogs—yah, yah, yah!” came the prompt response from the space cruiser *Castor*’s side of the arena. But it was a weak and disheartened chorus. 850 to 25 the wrong way at the end of the first half was not the sort of score to inspire a cheering section. The *Pollux*’s Dazzle Dart team was mopping up—and how!

Captain Bullard of the *Pollux* was no exception to the rest. He flopped back into his seat red of face and utterly exhausted. His vocal cords had gone long since, and now he could only gasp and speak in weak whispers. Captain Ellington, com-

mander of the mine division, leaned over and congratulated him.

“You’ve got the General Excellence Trophy in the bag,” he said. “That is the third time in a row, isn’t it? That means you keep it.”

“Yes,” said Bullard, feebly. “But, oh, boy, who would have dreamed of picking up a player like this MacKay! I asked for him on account of the way he handled that Jovian surrender, but I had no idea he was such a whiz at Dazzle Dart—”

Then Bullard’s husky voice failed him altogether, and he turned to watch the parades between halves.

The interfleet athletic meet, held for the first time since the Jovian armistice, had been a howling success from his point of view from first to last. The hand-picked, well-trained skymen of the *Pollux* had taken every major sport. The meteor-ball contest had been a push-over; they earned over eight hundred of the possible thousand points at saltation—that grueling competition of leaping from a stand at all gravities from zero to two and a half. They had outswum, outrun and outplayed their competitors in practically every one of the events. And now, in the most critical test of all,



they had a walkaway. He had expected it, of course, but not by such a tremendous margin.

In the meantime the crowd milled and whooped on the plain at the bottom of Luna's well-dome crater Ashtaroth which was the athletic field of the great Lunar Base. Captain Bullard regained his breath and sat watching. Good boys, his, he was thinking, all of them—whether at war or at play. Then there came another touch at his elbow and Lieutenant Commander Bissel was there, aid to the commandant.

"I hate to inject a serious note into the festivities," he apologized, "but there's something hot coming in over the transether. Remember Egon Ziffler, chief of secret police of the Jovian Empire—the Torturer, they called him?"

Bullard nodded.

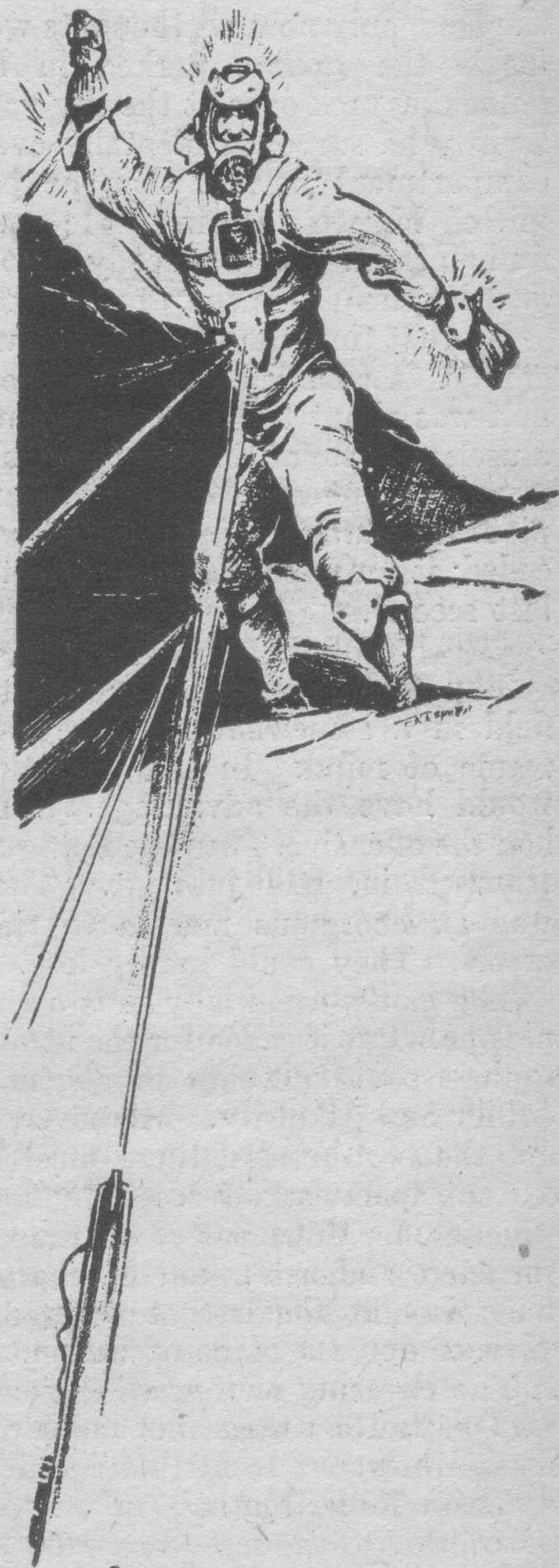
"He's been located, and at Titania, of all places. He appeared in a Calistan cruiser and took the place by surprise. Apparently he massacred the entire garrison in the most fiendish manner; the admiral is talking now with the sole survivor who, somehow, managed to escape to Oberon. The worst of it is he is in possession of our experimental arsenal and proving grounds—"

"Yes?" said Bullard.

"Yes. It has not been released yet, but that deadly new electron gun worked perfectly and there are hundreds of them there. With those in their hands they will be almost invulnerable. Only the screens of a star-class cruiser can resist the hand-size model, and I doubt if those could stand up to the heavier Mark II we planned to build."

"That's bad," remarked Bullard, with a sigh. It seemed that no matter how much clean-up work they did, there was always trouble.

"Yes," agreed Bissel, soberly, "it





is bad. But I'll toddle along and get the latest. By the time this is over maybe I can give you the full dope."

He slid out of the box, and Bullard turned his attention once more to the field, only now his thoughts were inside the *Pollux*, parked in her launching rack over at the sky yard. Swiftly he surveyed mentally every compartment in her, then he permitted himself to relax. He could find no fault. She was ready to soar. Just let them give the word.

By that time the playing field was empty. A whistle blew. The second half was about to begin. It seemed a useless waste of time, but the rules were unchangeable. A fleet championship game could not be conceded; it must be played out to the last second.

THE CASTOREANS came onto the field in a somewhat more cheerful frame of mind. In this half they would have the advantage. They had the offensive. Then the Polliwogs tramped in, still jubilant. There was an enormous margin to their credit. They could hardly lose.

The game, essentially, was a simple one. But it called for the utmost a man could develop in alertness, agility and dexterity. Moreover, to get the best results, there must be instant teamwork, secured by long practice, for there was scant time to interpret and act upon the sharply barked code signals that demanded various degrees of co-operation.

The elements of it were these: it was played on a court not much different in layout from that required by basketball, football or jai-alai. There were two opposite goals, set high in backstops. The goals were six-inch black holes in which were selenium units. A semicircular wall, four feet high, guarded a forbidden area at the foot of each backstop.

The quarterback of the offensive team had a flashlight—a superflashlight—which was loaded for each half with exactly one hundred ten-second flashes of light. The light was delivered in a thin pencil of one centimeter in diameter, and the inner mechanism of it was so designed that the operator could deliver it flash at a time by simply pointing it and pressing a button. But once the button was pressed, the light stayed on for a full ten seconds and then went out abruptly, counting as one serve. The idea was to cast the ray into the opposite goal hole. If the bell rang, the quarterback scored twenty-five points.

The defenders' aim was to intercept and deflect the light—into the other goal, if possible. Should they succeed, their score would be double. To effect this, they were equipped with as many slightly convex mirrors as they thought they could handle. The mirrors were not dissimilar from the type worn on the brow of a throat specialist. Players usually wore them strapped to their wrists, but stars could not only manage those, but also ones strapped at their waists and on the head as well. A good jumper was a distinct asset to a team, and the *Pollux's* five salutory champs had been of invaluable assistance.

They took their positions. Weems, captain of the *Castor* team, had the torch. His twenty guards were ranged about him. The Polliwogs scattered out at the other end of the court, tense and waiting. Tackling, holding or slugging was barred, but a man could drop on all fours and make an onrushing opponent stumble over him. There was no more to the game than that.

Weems maneuvered for position, then leaped unexpectedly into the air, and it was a goodly leap, as they



were playing on strictly Lunar gravity. At near the top of his flight his hand darted forth and he sent a beam of light at his goal. It struck the backstop not a foot from the goal, but before the eagle-eyed Weems could shift his hand, a Polliwog player was in the air and had caught it with one of his reflectors. A twist of the wrist sent it hurtling back to the other side, a narrow miss. The source of it—Weems—was falling now, and he jerked his arm, throwing the light sharply downward, where one of his own teammates caught it and shot it up at a steep angle under the hovering Polliwog guards. A bull's-eye! And not an instant too soon, for at that moment the light went out. Twenty-five points for the attackers.

So it went—so swiftly the eye could hardly follow. Despite the fact that it was customary to fill the arena dome with humid air and spray dust in it so as to illuminate the darting beam throughout its length, it took the glance of an eagle to keep pace with it. A battery of cameras, of course, recorded the play constantly, and the selenium-cell-operated bell bonged from time to time as the light ray hit it.

The second half was full of brilliant double and triple plays, where often the quarterback would turn and flash his light directly behind him to a confederate who relayed it across the court, who in his turn shot it into a momentarily undefended goal. The ultimate score, though, was against the Castoreans. Their defeat was so decisive as to admit no quibbling.

The cheering lasted for minutes, but hardly had the final goal bell rung before Bullard was aware that the grand admiral himself had entered his box and was sitting beside him.

"Congratulations," said he, then addressed himself to serious business. "You have already heard a little of what is going on on Titania? I sent Bissel. It is a scurvy trick to recall your crew and send you out on a desperate mission at an hour like this, but there is no other ship ready. Since the armistice it seems that there has been a letdown in discipline. Can you blast off in four hours?"

"I can blast off in one hour if you'll give me an all-Moon hookup on the public-address system," said Bullard, without batting an eye. He had not only been expecting the detail, but hoping for it. Ziffler was a creature he loathed from the bottom of his heart—treacherous, cruel and unprincipled, of a breed that extermination is the only cure for.

Within five minutes Bullard was making his appeal to his skymen.

"On the double!" were his last words, and he slammed down the transmitter.

THE BURNED and looted fortress of Caliban lay directly under. Bullard pushed his navigator aside and took the controls himself. He set the antigravs at half strength and slowly lost altitude, constantly searching. At last he found them. There was a parked cruiser of the *Dernflug* class, and a horde of men camped outside alongside it. Phosphorescent flares burned, and he saw they were celebrating. Kegs of the type used as containers for the potent *snahtger* liquor rolled all about, and the thickest of the rioting throng were gathered about others yet upright.

"The ship, first," said Bullard, grimly, and his gunnery officer—Fraser—said only, "Aye, aye, sir."

The searing, blinding beam of incredible power leaped downward,



played a moment on the cruiser, then flickered out. On the ground there was left only a mass of running molted metal, sputtering a valedictory of brilliant sparks.

"Cease firing!" was Bullard's next crisp order. "The grand admiral wants them brought in alive, if possible." He reached for the antigrav control and pushed the deflectors on hard swing.

The *Pollux* came down a mile away to an easy landing on the dark plain. The people in her could plainly see the floodlamps of the rollicking bandits and the sharp reflections that glinted on the smooth terrain between. There was nothing to impede the progress of the landing force.

But by the time the landing force was ready for its trip, the lookout reported a new development. A party of men was approaching, and they were stretching their arms over their heads in gesture of surrender. A close scrutiny of them could discover no arms worth worrying about. The new electron projectors were said to be quite heavy, each requiring two men to carry and operate. Any less potent weapon the veterans of the *Pollux* could deal with, and deal with well.

"Find out who they are and what is their proposition," ordered Bullard. "If it sounds reasonable, let three in for a parley. No more. He is full of slimy tricks, that Ziffler. I wouldn't trust his words under any circumstances."

It was not Ziffler, but Skul Drosno, former vice premier of the Jovian regime, together with two high aids. They wanted to arrange terms of surrender, they said. Their story was that they had revolted against the atrocities of Ziffler and had him a prisoner in their camp. They would trade him—trussed up as he was—

for personal immunity and a general pardon for their followers. They would willingly submit to trial, knowing now how they had been hoodwinked.

"Let them in," said Bullard, though he was still a trifle doubtful. "I will talk with them."

Skul Drosno began his appeal. Bullard recognized it at once as rank sophistry, but he continued to listen. Then, to his astonishment, Drosno suddenly slumped in his chair. His eyes were crossed to a painful degree, and his hands wavered uncertainly in the air. The next moment he pitched forward onto the deck and sprawled, apparently unconscious. One of his aids looked sick, and staggered to his feet, weaving about ridiculously.

"What an act!" thought Bullard, and sprang to his own feet, alert. He shot a glance to his side and saw that his executive, Moore, who had been with him, was an inert heap. And at that moment things began to blur before his own eyes. His knees wobbled, and he heard a harsh, metallic ringing in his ears. He fought for air, then choked. The floor plates rushed upward and struck him squarely in the face. After that Bullard remembered no more.

THE NEXT VOICE he heard was the high-pitched cackling of the unspeakable Ziffler.

"Can such things be!" crowed the vile Callistan. "A great personage, no less. I find as my prisoner the inimitable, the invincible, the incorruptible Bullard—hero of the nine planets!"

Bullard opened his eyes, ignoring the pounding in the back of his head. He was seated in a chair, strapped hand and foot, and the swaggering ex-police chief who had terrorized



the Jovian satellites was standing before him, exulting.

"Perhaps he is not so invincible," pursued his tormentor, calmly lighting a cigarette and seating himself. "We have never seen him outside his formidable *Pollux*. But now that he is in our hands, I am curious to see how good he is. Hagstund! Come here!"

A big brute of a former convict strode forward.

"What do you say? Shall we have a little sport? Why not put these men in spacesuits and turn them loose for twenty-four hours? Then we can have a hunt. This man, in particular, has a gr-r-reat reputation for cleverness. Let's see what he can do on a barren and resourceless planet. We have counted them, so we know their numbers. I will give a prize, prizes. Ten thousand sols for this one, to whoever brings him down. Another ten thousand for the last man of the lot and another five for the next to the last. It'll be good fun, eh?"

Ziffler took a swig of *snahger* and delivered himself of an elaborate wink. Bullard did not believe for a moment he was drunk. Ziffler was too clever a scoundrel for that. It was a gesture meant to raise false hopes. Bullard knew all too well what the wastes of Titania were. He had been there before. Except for the port of Caliban, the arsenal and a few scattered stations which no doubt had been plundered by now, there was nothing but bleak, frozen plains, broken by rugged meteor craters.

"Swell, chief," agreed the henchman. "What about the ship?"

"Leave her lie as she is. They'll not send another for days. I don't want you baboons monkeying around inside her. Let's give these guys a run, then we'll get down to

business. There's plenty of time."

Rough hands pulled Bullard to his feet, and at the point of one of the new and deadly electron guns they made him put an ordinary spacesuits. As the mists cleared away in his throbbing head, he saw that he was in a large hall, and that other men and officers of his crew were being similarly treated.

"Oh, by the way," remarked Ziffler, offhandedly. "They say I am unkind. I'll save you one bit of mental torture. What got you down was our new hypnotic dust. It's very clever, really. Powder a coat with it, for example, then expose it to air. It vaporizes and puts everyone to sleep. My emissaries went out, too—naturally. All but one, that is, who had been heavily doped with an antidote beforehand. He survived long enough to open the door for us, then, unfortunately, died. It was regrettable, but in my business I find it necessary to do such things."

Bullard said not a word. He was ready. The outlook was black, but he had seen other outlooks that were quite as black.

"I'll be seeing you, Ziffler," he said, and hoped it was not mere braggadocio. Ziffler had a reputation for sadism, but not for courage. There was the bare chance that that single psychological shot in the dark might in time be digested and unsettle him. "Let's go. I prefer anything to your presence."

"Yeah?" said Ziffler, but he beckoned to his strong-arm squad.

THE ENTIRE CREW of the *Pollux* was there. They were pushed out through the portal of the dome in squads of four and told to get going. Bullard was let out last of all. Their captors promised tauntingly that they had a full Earth day before pursuit.



"Stay together, men," called Bullard into his helmet microphone, the moment the portal closed behind him. "All officers come up close to me."

The light on Titania is dim, even in full daytime. But it was good enough for his officers to read the swift manipulations of his fingers. Their skipper was using the sign language all trained Space Guards men used when they feared their words might be overheard.

"Poleward from here," Bullard told them, "some thirty miles, is a meteorite crater. For several years we have maintained a secret laboratory there and it is possible that these ruffians have not discovered it. That will be our destination. Under this gravity we should reach it within a few hours, though I am uncertain of its exact direction. Have the men spread out and hunt. There should be flares there, and the first man in should light one. The last time I visited the place it had a staff of eight or ten scientists, and an excellent interplanetary radio. They may have weapons, but at least we can flash an alarm."

Rapidly waved arms acknowledged, and the Polliwogs dispersed in the semidarkness.

It was Lieutenant Alan MacKay who reached the spot first. He had trouble in finding a flare, but eventually he found one and lit it. The laboratory was a shambles. The vandals had found the place, despite his captain's hopes to the contrary, and turned it upside down. The bodies of the physicists and chemists lay all about, and the unhappy director's corpse was discovered nailed to the wall, crucifix style. Torn papers, broken glass and tangled wire littered the floor. The radio had been smashed almost out of recognition.

MacKay, a newcomer to the service, shuddered, but he carried out his orders.

Bullard arrived shortly after, and his face was not pretty to see as he viewed the wreckage. Now he regretted the flare. *They* undoubtedly had seen it, too. He had hoped to warn these people, send a message to the System in general, then have his forces scatter. A few of them might have hoped to survive the ruthless man hunt that was to follow.

But the situation was changed, and since any alternative seemed as hopeless as any other, he let the flare continue to burn. By keeping together, some resistance might be improvised. While he was waiting for the stragglers to come up, he busied himself with reassembling the torn pages of the notebooks and journals strewn about the floor.

Much of them dealt with routine analysis, but on a page written in red ink and numbered "97" he found a fragment that brought him to eager attention.

Unlike most meteorites, the one that made this crater failed to disintegrate upon impact—or rather, not all of it disintegrated. We have discovered a number of fragments, slightly curved, that indicate it was stratified, and that the stratum of radius, of about thirty meters and of one and a fraction inches in thickness, simply broke into bits instead of molecules. In the storehouse in the crater bottom there are more than a hundred of these fragments, running up to as high as twenty centimeters across. They are of a jadelike substance, subject to abrasion by ordinary methods and can be drilled by steel drills, and are not hard and ultradense as might have been expected. The curious thing about these fragments is that they defy X-ray analysis. For some odd reason they wreck every tube that is brought to bear upon them. They backfire, so to speak. Can it be that—

The page was at an end. Bullard sought frantically for page 98, but he



could not find it. He called the trusty Benton.

"Take a gang of men and go down and search the crater. You ought to find a storehouse and in it a bunch of junky-looking rock fragments that look like jade. If you do, bring a flock of them up here. Quick!"

To the others standing around, he said:

"Clear out the wreckage in the workshop and see if those breast drills can be made to work. Strip the boots off of those dead men and cut them up into straps. As soon as you have done that, take off your own and cut them up, too. We haven't got time to lose."

Presently Lieutenant Benton came back, and a number of men were with him. They all bore armfuls of slightly curved pieces of a moss-colored, glasslike substance. Each was fairly large, but all had irregular and jagged edges. Bullard examined one hurriedly, hefting it critically.

"Get MacKay up here—quickly," he barked, suddenly. Then he wheeled on Benton. "Take all of these and drill two pairs of holes through each—here and here"—and he showed him. "Then affix straps, just as you would to those mirrors you use in the Dazzle Dart game."

Benton looked at him wonderingly, but he had learned a long time before to put his trust in his remarkable commander. He piled the shiny fragments of meteor stuff together and went out to call in his men.

Bullard felt better. What he was about to attempt was a wild gamble, but it was immeasurably better than waiting like a sheep for the slaughter or fleeing hopelessly across the cold wastes of Titania. He was very thankful, too, that on the occasion of his last visit to that satellite he had cut the governor general's party and ball and visited this se-

cluded laboratory instead. For the day he had been there was shortly after the experiments described on the isolated page he now held in his hand. At that time nothing had been definitely determined as to the structure of the mysterious crystalline substance salvaged from the crater, but he recalled the speculations of the now dead scientists concerning it.

Lieutenant MacKay reported.

"Yes, sir?"

"Tell Commander Moore to have all the members of the Dazzle Dart team report to you here at once, and that means the men on the second team and the scrubs as well. Tell him to have everyone else find pits in the crater bottom and take shelter there until further orders. Clear?"

THE RUFFIANS of the Ziffler gang did not play entirely fair, as was to be expected. They beat the gun by several hours. It was Benton, in charge of the lookout, who sighted the mob advancing across the plain. They were in fairly close formation, as if by direction finders or some other means they already knew that the *Pollux* men were not scattered, but together at the so-called "Mystery Crater."

"Take stations," ordered Bullard, crisply. He was standing in the semidarkness on the crater rim, some distance away from the damaged laboratory. To the right and left of him his victorious Dazzle Dart team were lying behind the irregular parapet made by the crater wall.

"Benton!" he called. "Scatter your squad both ways from me. When that gang of hoodlums is halfway up the hill, let 'em have your flame-gun blast. Then duck and beat it for the bottom of the crater and hide out until I call 'all clear.'"

Benton had found eight old flame



guns in a work shed. They had been obsolete as fighting weapons for many years, but could deliver a nasty burn.

Captain Bullard had another look at the advancing hunting party. He saw that they had brought along a number of the new electron guns and were beginning to struggle up to the talus with them. The yelling mob reached a sort of ledge and waited for the guns to be brought up. A jeering voice, louder than the rest, called up:

"Will you come down and take it, you lice, or do we have to come up there and get you?"

"Now!" said Bullard softly into his microphone.

Eight feeble heat machines spat their ruddy blasts, then went out with a jerk as their operators let go of them and slid down the inner wall to safety. It was well that Bullard had foreseen the reply they would get, for the counterblast came almost instantaneously. A score of bright stars flamed out downhill and from them thin streams of almost invisible violet fire lashed upward and played along the crater rim. The rock sprang into incandescence and inches of it melted and flowed as bubbling, sparkling slag down the slope, where it quickly dulled to red and congealed.

"Now?" asked MacKay, anxiously. He was crouched beside the skipper.

"Not yet. Wait until they are closer."

The assault went on for a moment, then stopped. Bullard took a cautious peep and saw the Callistans had resumed their climb.

"What's the dirtiest thing you can call a Callistan?" whispered Bullard, grinning unseen in the dark. "You know the lingo."

"*Froahbortlen*," replied MacKay

without hesitation. The Callistan language was rich in epithets, but that one was the most comprehensive and unequivocal ever coined in any language. Even a depraved criminal of the lowest grade would resent it.

"Invite them up," said Bullard, grimly. "When they answer, do your stuff."

"On your toes, men," MacKay warned his teammates. Then he opened his mike wide and issued his sizzling, triple-barreled, insulting invitation.

Bullard involuntarily caught his breath. The die was cast. For an instant one of the qualms of uncertainty that rarely came to him held him in its grip. Was he right, or would they fail? Which side would be the victims of the massacre about to begin? Well, in a couple of seconds he would know.

The properties of the strange meteor substance was still unknown. It stopped Gamma and other hard rays. It wrecked the X-ray tubes focused upon it. How could that be, unless it also possessed that long-hunted, but never found, property of being able to deflect and reflect the high-pressure beams?

MacKay's helmet still vibrated with the last vile words of his superb taunt when the answering salvo of electric fire came. But that time there was more than inert rock to receive it. A row of alert young men stood on the crest, and a weird-looking crew they were. Glistening bits of rock were strapped to their wrists, to their foreheads, their belts, and even their ankles. In an instant they were leaping, dancing and twisting like mad dervishes, deftly parrying every violet pencil that struck above the rock at their feet. The devastating power was being hurled



back whence it came.

The ruffians must have been amazed at the swift return of fire from men they thought to be totally disarmed, but they hung on doggedly for a few seconds more. Then their fire ceased altogether, and all that the observers on the rim could see was a few scared survivors scrambling down the way they had come.

"Too bad we haven't a weapon," sighed Bullard. "We could make a clean sweep."

HE WHIPPED OUT a flashlight and strode down to the ledge. There were many of the abandoned electron guns standing about on tripods, or overturned by the fleeing gangsters. Something soft gave under Bullard's boot. He played his light along the ground and saw a sight that under other circumstances would have been revolting. Loose hands and feet, attached to charred stumps of arm or leg, were strewn widely. Other and less readily identifiable fragments of disintegrated humanity lay among them. Ziffler's strong-arm squad, once the terror of the outer planets, had been dispersed in the fullest sense of the word.

Bullard turned on his amplifier.

"O. K., Moore. Round up the

men and bring them down. We're going back."

The trek back across the icy waste seemed infinitely shorter and easier than it had on the outward journey. Men's hearts were light now, and not leaden as before. To the Polliwogs, the knowledge they had lost their ship had been as dispiriting as the seeming certainly of their impending doom. Now all that was changed. A mile ahead of them lay the *Pollux*, just as they had left her.

The search for Ziffler and the stragglers took some time, but they found them, cowering and whimpering behind a boulder.

"Iron them well and throw them into the brig," snapped Bullard, and went into his ship.

He grabbed a signal pad and wrote a brief report.

A little later the grand admiral at Lunar Base stretched out his hand for the flimsy bit of yellow paper his orderly had brought him. He read it, then read it again. He frowned a little and scratched his head.

"Has Bullard gone highbrow on us, or what the hell?" he asked, tossing the message over to Bissel. Bissel picked it up and read:

After reflection, the enemy succumbed.  
BULLARD.

THE END.

# ROMEOS



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# SERGEANT TERRY BULL'S TERRIBLE WEAPONS

by Willy Ley

*An article concerning the terrible—if as yet hypothetical—weapons designed by day-dreaming ordnance experts. These not only might be, but could be, and would work!*

THE sergeant who is acting as receptionist in an army building in New York recently told a few newspapermen that he had dealt with sane people—reasonably sane, that is—before the war began. But since the start of the war, especially since the French debacle, he feels in a position to match crackpots with any director of an insane asylum. This may sound like a harsh and somewhat malicious statement; but if a man has to fight off an “inventor” who wants to insert a tiny steel nameplate into each rifle bullet so that decorations to the riflemen could be awarded according to “target results” after a battle—and if the same man, five minutes after he won *that* battle, has to speak politely—and at length—to another “inventor” with complete blueprints for an invisible airplane—I maintain that such a man may be forgiven for thinking harsh thoughts and for uttering them in public.

There is no doubt that war breeds inventions, military inventions, of course. Roughly three in two hundred are worth while, but even many of them are not new. Others which may be worth while might be unusable for reasons that can be lumped together under the term “difficulties of production.” And still others may offer a slight advantage

but would, if accepted, cause great disadvantages of various natures, like necessary changes in other equipment or changes in tactics requiring the retraining of troops, which more than counteract the slight advantage offered by the new invention.

But these are the “good” cases. The normal run of military suggestions made by nonmilitary and non-professional people consists of the question: “Why don’t they—”

Why don’t they just string high-tension wires across the roads the enemy has to travel?

Why don’t they develop the death ray about which I read in the Sunday supplements a couple of years back?

Why don’t they build airplanes that can outfly anything the enemy builds? (On the other side they are asking that, too.)

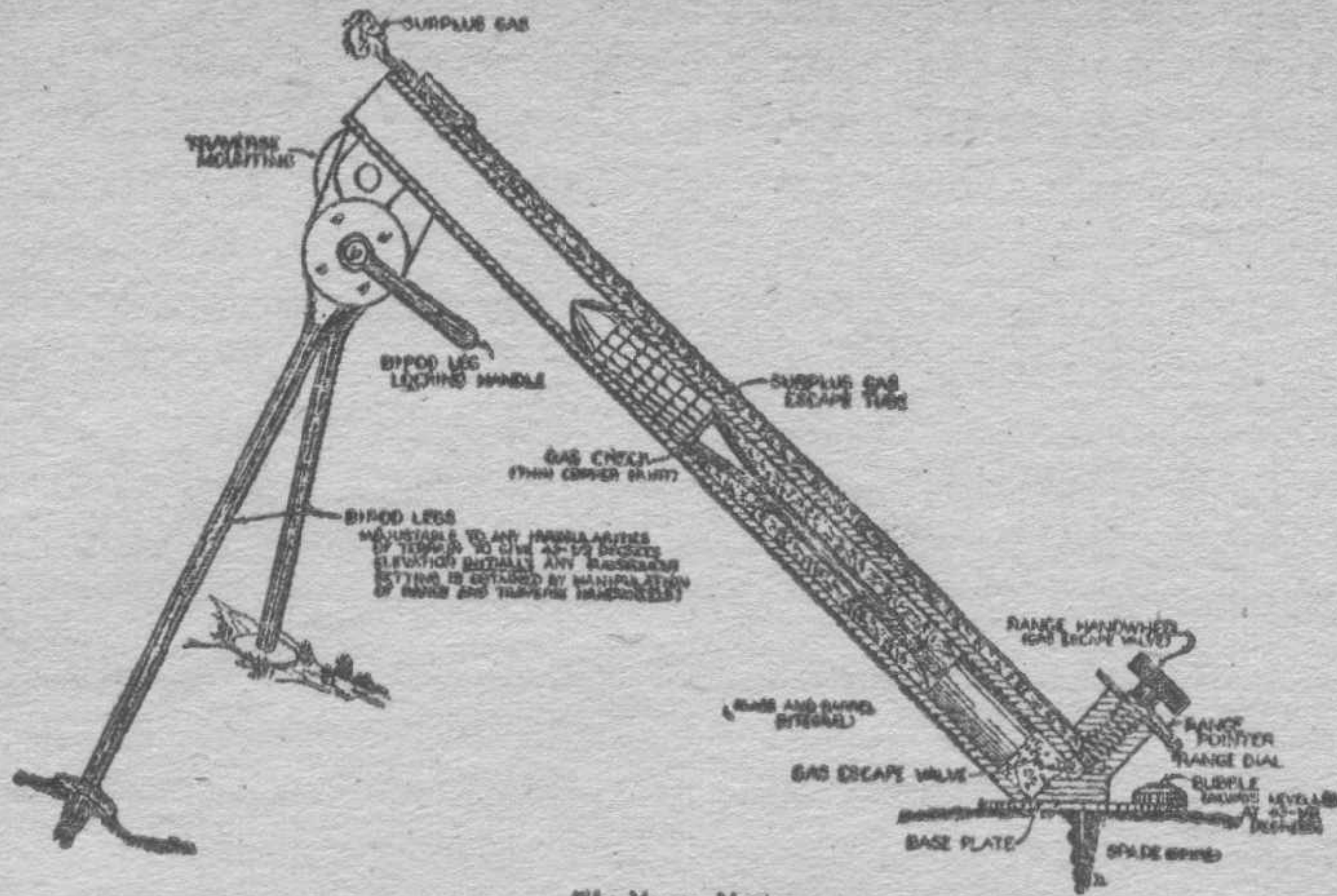
Why don’t they shoot shells filled with live and hungry fleas at the enemy?

And, a little more scientific:

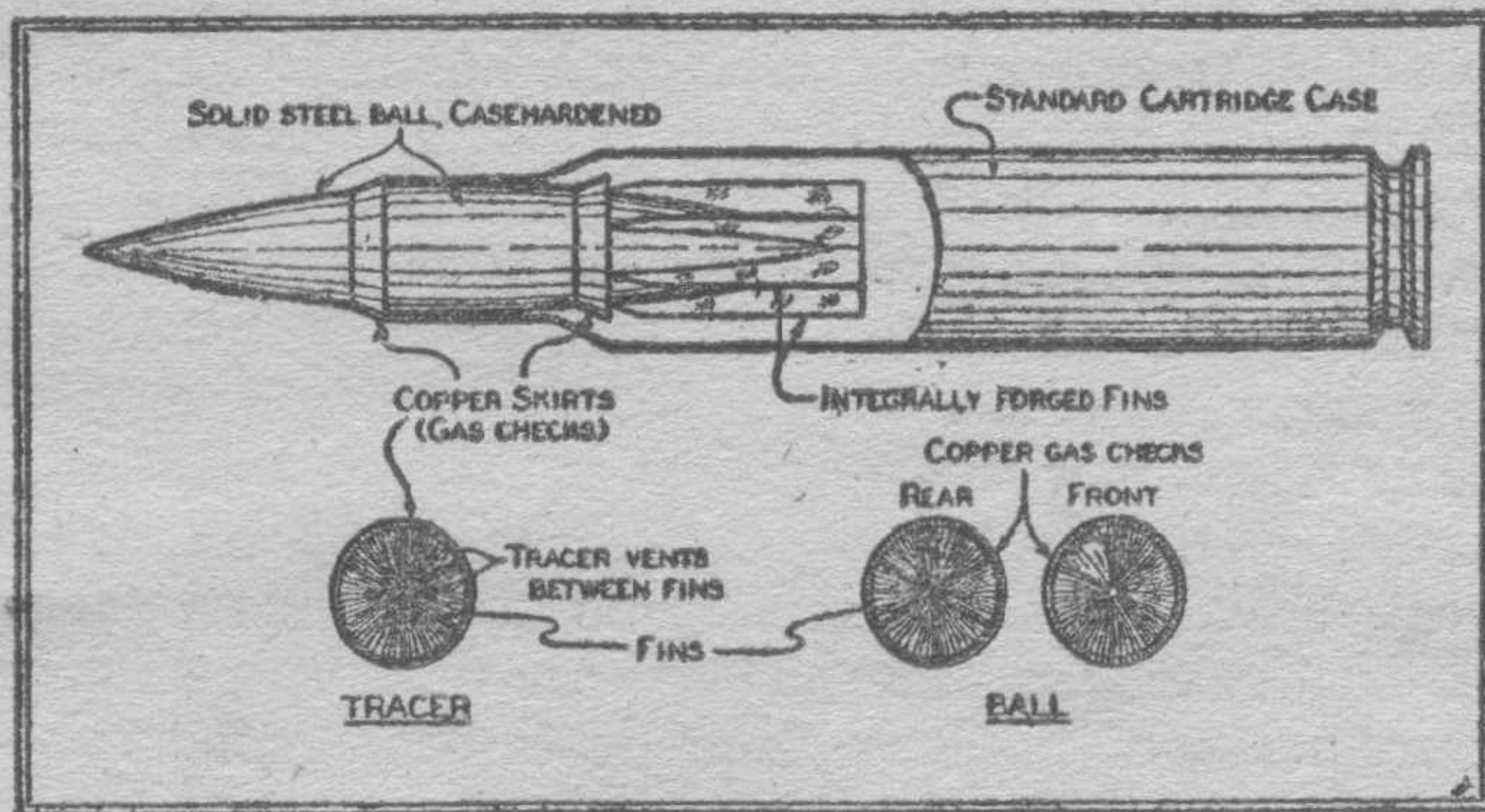
Why don’t they create a terrible magnetic field in the enemy camp which would draw all iron and steel implements together? Or at least ruin all instruments?

Now, these are not dumb jokes I have been thinking up while reading galley proofs. These are sug-





The Manzo Mortar.



The Winged Bullet

gestions that were very earnestly and very sincerely made by honest and loyal people who were trying to help their armed forces in the conduct of a war. Some of these suggestions are of recent origin, some date back to the World War of 1914-18.

But the story has a serious side, too. About three out of two hundred suggestions are worth while and, after all, every existing invention started out with somebody imagining something. The submarine started that way and the airplane, the repeating pistol and the typewriter. And Americans have been especially prolific in imagining weapons which were worth while and which won battles, if not wars.

Samuel Colt's revolver, "the gun that won the West," is an American invention. So is Dr. Richard Jordan Gatling's rapid-fire gun, invented—though not used—during the Civil War. The first automatic gun which utilized the recoil for reloading was invented by Hiram Percy Maxim, and John Moses Browning is the father of the modern machine guns in service now. The airplane is mainly an American invention and the dive bomber completely so. The American Benjamin Holt invented the caterpillar tread, originally for farm machinery.

Modern navies were born the day John Ericsson conceived the *Monitor* with its low armored hull and its re-



volving armored turret, the latter being the invention of another American named Theodore Timby. The history of the submarine consists almost exclusively of American names, from Jacob Bushnell's *Turtle* (1777) and Robert Fulton's *Nautilus* (1798) to Simon Lake's *Argonaut* and John P. Holland's U. S. S. *Plunger*, the first practical naval submarine.

Robert Fulton's name is, of course, a reminder that the steamship itself is an American invention. And so is barbed wire. And for all these reasons the lurid pictures and highly imaginative stories that are dreamed up in thousands of American homes—and that get published occasionally in Sunday supplements—are not entirely useless. But things get more serious when military experts begin to dream. *They* know what it's all about. They know that new weapons are, as a rule, good only when they offer great advantages with relatively small disadvantages. They know the requirements of military service and they know what "production" means.

ONE of the most important American military journals, *The Infantry Journal*, has been publishing such dreams for some time. They were all written by "Sergeant Terry Bull," and they are laid against a common background, the war between the United States and the "Mungo Empire," due to take place some years from now. "Sergeant Terry Bull," in those articles, is instructing his men from time to time, either about new forms of army organization, about new tactics of combat or simply about the use and the advantage of new weapons that come from the government laboratories and the factories to the battlefield.

Foreign journalists, whose knowl-

edge of English is not what one should want it to be and who cannot conceive of anything fictitious or even humorous published in a military journal, have occasionally fallen for these inventions and written "exclusives" for their papers, telling their readers what the Americans are up to next. And even American editors have occasionally instructed their photographers or research desks to get "real photographs" of the equipment drawn in blueprint form and described in the latest issue of *The Infantry Journal*.

Well, to keep the record straight: "Sergeant Terry Bull" is in reality Major William S. Triplet of the infantry board at Fort Benning. The equipment he describes is occasionally based on ideas of other officers of the United States armed forces\* and it exists only on paper—but the ideas are sound, and it is anybody's guess how long it will take until they assume more than paper reality. They are not super-airships or similar death-dealing marvels of super-ingenuity which would require the lifetimes of scores of experts to accomplish. They are simple and, in a certain sense of the word, modest—and that is what really counts.

One of the weapons suggested just deals with a new type of hand grenade. It is well known that during the World War the Allied troops mainly fought with the type colloquially known as "pineapple" while the Germans, even though they also had such "pineapples"—termed *Eierhandgranaten* for short—relied chiefly on the stick grenade or "potato masher." The stick grenade does not produce many splinters; it acts by the sheer force of explosion and

\* The "winged bullets" are the original idea of Major Harold G. Sydenham, the "destroyers" are the original idea of Major Edward A. Chazal. Both these ideas will be discussed later on in the article.



is, therefore, most deadly in confined spaces, such as dugouts. But the stick has an important advantage; like the throwing stick of some tribes of aborigines it increases the leverage of the arm and therefore the distance over which it can be thrown. Any soldier who handled both types knows that it is simply not possible to throw a "pineapple" over the same distance as a stick grenade.

The hand grenades of the "Mungo War" are, logically, a combination of both types, a "pineapple" with a handle. But the handles are not made of heavy wood as were those of the Germans. They consist of a hollow plastics tube, just strong enough to stand the strain of handling and throwing. Such a light plastics handle acts like the tail of a kite or the fin of a bomb, the grenade will always strike the ground headfirst. The fuse, therefore, is of the type that blows up on impact—with a few added safety features. No fuse will work as long as the safety pin has not been pulled out. And the pulling of the safety pin does not require throwing within a few seconds; the grenade, while "ready," still remains safe.

When the grenade is thrown, the plunger—which, by means of a rather large disk attached to it on the outside will work even if the missile should drop down in very soft mud—still has to shear a wire. That wire has sufficient strength to withstand the jolt it receives when dropped from a height of six feet so that a man who accidentally drops a "ready" grenade will not be blown up by his own weapon.

ALL THIS sounds so little like "things to come" that it isn't at all surprising that editors applied for photographs of the real stuff to be

published along with the diagram.

But the idea of such a hand grenade was elevated to greater heights with a description of the "Mungo Mortar," allegedly captured from the enemy. The "Mungos" must have captured a few specimens of such hand grenades first, because they used them as models, added a few ideas of their own and, evidently heeding the old cry of the ordnance department for "as few different types of shells as possible," remade them into a first-class light mortar shell *which could also be used as a hand grenade.*

They did that by changing the fuse around a bit and by attaching vanes to the end of the handle, surrounded by an aluminum cylinder about four inches long. In flight, regardless or whether the grenade was shot or thrown, the cylinder acts as additional vane, making the projectile always strike headfirst. At the same time the cylinder, with an outside diameter of forty millimeters or about one and one half inches, is a convenient handle for throwing. Finally it can be made to serve as container for the powder cartridge for shooting.

How these things are shot and how the mortar works is another most interesting and, I believe, very new idea. But I'll now quote from Sergeant Terry Bull's lecture to his men:

"The powder charge, set back here between the vanes, is a curiosity. There's nothing but a primer, set in this aluminum anvil, and the powder is rolled up in this cellophane cartridge, varnished on the outside. Of course the cellophane, cellotex, or whatever the stuff is, burns as clean as the powder, and they don't have the trouble with pieces of cardboard shotgun shell like our gunners do. This copper skirt around the body is



the gas check. It expands with the sudden pressure and seals the bore. When you start throwing a shell fifteen hundred yards you can't afford to waste much of the gas.

"Increments? I see you've been to a mortar school, too, Nicollela. No powder increments to fool with on this gun. The whole charge is right in this cartridge in the base of the tail. Yes, and this one charge throws the shell from fifty to fifteen hundred yards with the mortar set at *constant elevation*—believe it or not!

"Well, take a look at the gun. See this handwheel at the base of the barrel? That's what they use on this gun instead of powder increments. We take powder increments off of our shells, according to the range, and throw 'em away. The Mungos burn all the powder in the gun, and by-pass what gas they don't want to use.

"Now if you want to throw a shell out to fifteen hundred, you want to use all the powder, so you close the valve to the right, all the way. Wipe that breech off some more, Amovich.

"With the valve fully closed like that, *all* of the powder gas has to shove out the main barrel, behind the shell, and you get your maximum range. But suppose you want to lob one out just beyond hand-grenade range. Then you open up the valve to the left—all the way. That lets the biggest part of the gas out of the breech and through this gas-escape tube, before the shell has time to even get started good.

"No, Flanagan, you're getting too technical. You don't need a range table either.

"Watch! As I move the handwheel, see this pointer move with it? This circle of figures on the valve base is the range scale. It's in meters of course—they don't use yards

—but you can use it anyway. Just estimate your range ten percent short. Let's see, five hundred meters is about five hundred fifty yards—and that's as close as I've ever seen any of you estimate ranges. Even a green crew can learn to handle it in a couple of hours."

Some experiments with this article have taught me that it was not believed as readily as the description of the hand grenade; probably because my experimentees did not know enough about mortars and ballistics in general to appreciate the idea of the gas by-pass. But I wish that somebody would start experimentation along those lines; they sound awfully promising. However, I'd like to see a detailed mathematical analysis of the amounts of gas that have to escape and about gas pressure, et cetera, et cetera, before I'd dare to predict the size and shape of escape valve and escape tube.

Now it seems that the Mungos did not only possess a fine trench mortar but that they, aside from having adopted body armor for their shock troops, were superior in tanks—until the *destroyers* came along. Those destroyers, the down-to-earth counterpart of the interceptor airplane, are not tanks. Nor are they armored cars. They are just what their name says: tank destroyers, "long, lean low-slung and lethal." The destroyer is four and a half feet high, six feet wide and twenty feet long, with a 544-h.p. oil-burner engine and a fuel tank that holds enough oil for a 250-mile drive. It has ten enormous wheels and a ten-wheel drive that works on any kind of terrain. Being only lightly armored, the destroyer is much lighter than most tanks and much faster than any of them. Its crew consists of three men, sitting behind each



other, the commander who does the driving first, the gunner behind him and the loader last. The only armament consists of a rigidly mounted 75-mm. gun, aimed by aiming the destroyer. The destroyer is a better gun platform than a tank, and, rushing head-on, presents a much smaller target than a tank so that the odds are greatly in favor of the destroyer.

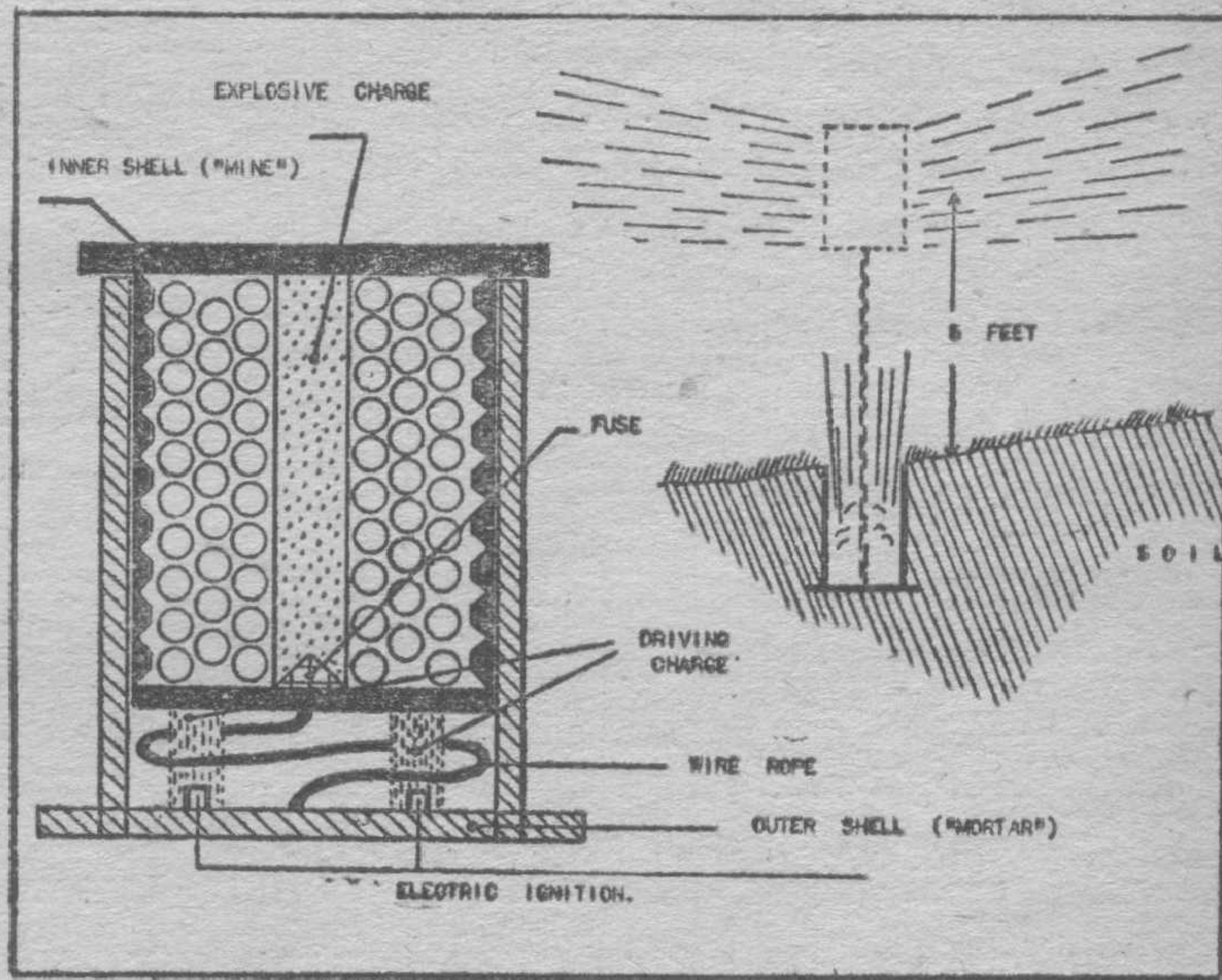
How the destroyer operates was described by Horatius Bull—Terry's brother—to one Mr. Smith of the *Star-Tribune* who had been sent to the front lines to "cover" a real battle—"God help him."

"I do the driving, I know where and how fast I want to go, and I can pick out the tanks I want to blast. I've got my face jammed into a foam-rubber mask on the end of a telescopic sight. That sight has crosshairs in it that are zeroed to the bore of the gun. So as I drive, I pick out a Mungo battle wagon off in the distance, and give my bus the gun. Soon as I get within four hundred yards, I ease over with my steering levers until my vertical crosshair is on the forward

edge of the target, and press the firing button. But that does not fire the gun. So long as my gunner has his health, I don't pay any attention to the horizontal crosshair. The gunner does the rest. He's sitting just in back of me with his face in another mask, with only

a horizontal crosshair in his scope. Every time he sees a Mungo tank bobbing up and down in his field of view he knows I'm gunning for it, so he twists his elevation handwheel until he gets the tank about in the middle of our pitch.

"Then he watches the crosshair. When it hits the Mungo's lower tread on the rise, he presses his firing button. No, that does not fire the gun—not unless I'm jamming my trigger, too. When both of us have our triggers down, an electric current passes through the coils of a solenoid of a magnetic—anyway, if we're both right at the same time, the gun fires—and a Mungo tank stops immediately afterward, if not



LAND MINE FOR USE AGAINST "PERSONNEL".

sooner. Hell, we can't miss—not often, anyway."

The destroyer can still battle with only two men, because the driver can lock the gunner's firing button in place and do all the aiming alone. But he does need the loader in the rear who is waiting to slam a new



shell into the breach of the gun when its recoil carries it back to him. He does not need to report that he is ready; as long as he isn't, the gun won't fire.

WITH the destroyer's 75s taking care of the heavy Mungo tanks that could not be harmed by 37-mm. so-called antitank guns, the picture of the Mungo War began to brighten. But there was still the uncomfortable situation of the Mungo shock troops with their body armor which could not be penetrated with rifle and rifle-caliber machine-gun fire.

Until, one morning, Terry Bull called his men together to show them the new M4 gun, *not* a rifle, with the announcement that the infantry is going smoothbore.

"You're right, Purdy, it *is* the M3, with a new barrel—and as fast as they can put our small arms through the arsenals, they're going to replace all the barrels. Everything that uses the .30-caliber ammunition is going through the mill and coming out with nearly four times the punch. They're not rifling any more weapons, and any that come in for repairs are getting the new barrels for reissue.

"What brought all this on was the winged bullet. Here it is—a case-hardened steel body, streamlined fore and aft, with six fins forged as part of the tail. The streamlined body cuts down the air res—the drag, and gives it more 'staying power.' It'll hold its speed and trajectory longer. Here, pass the samples back, Nussbaum, three to a squad. It's probably the greatest improvement in firearms since my great-uncle Zeke almost won his war with a percussion-cap gun. Notice the two copper bands around the belly of the ball. They're not bands,

they're skirts—to keep the body lined up true in the bore and act as gas checks. The greater the force of the explosion, the tighter these skirts are jammed out against the walls of the barrel. The bullet rides on these soft copper skirts, and never comes in contact with the bore at all.

"That's important. Maybe some of you birds have seen photographs of a rifle being fired—high-speed-camera stuff, you know. You remember how the first two or three pictures would have a puff of smoke getting bigger all the time in front of the muzzle? Then the next picture would show the tip of the bullet nosing out of the smoke. All the smoke you saw come out ahead of the bullet was wasted powder gas, leaking by the ball. Now that page shows a few photographs of the M4 being fired. When it gets to you, notice that there isn't a trace of gas coming out of the barrel in the first two pictures. The next shot shows the front half of the ball coming out of the barrel, and still no gas escaping. The last one shows the whole bullet, fins and all, jumping clear of the smoke cloud. The question is, if the rear skirt will hold back the gas that good, why have two skirts? There's a couple of reasons. If the bore gets pitted, some gas is going to shove by under the skirt when it's riding over the pit. If it does, there's nothing lost, because the second one catches it. Second, there has to be two skirts, so as to keep the steel ball from turning a little sideways and burring up the steel bore. With no powder gas leaking by the bullet, we use all of it to drive and that gives us a lot more speed. Instead of around twenty-seven hundred feet a second, this bullet takes off at a little better than five thousand."

Of course, it does not need any dis-



cussion to explain why a bullet with twice the muzzle velocity is more than twice as powerful; the speed appears squared in that famous formula  $\frac{1}{2} mv^2$  of the kinetic energy. Therefore, speaking broadly, a bullet of the same weight but twice the speed hits about four times as hard, a bullet with thrice the speed about nine times.

And it is very reasonable to assume that a bullet which utilizes all the gas pressure and that is not slowed down by rifling will attain roughly twice the normal muzzle velocity, using the same powder charge to drive it out. As far as the famous "production" angle is concerned, there can be no doubt that smoothbore muskets are easier and quicker to manufacture—and to maintain—than rifled barrels. The production of solid bullets ought to be easier, too. Besides such a gun would shoot accurately even when hot—because of the expanding copper skirts—and would last longer for the same reason. Incidentally, it would be a "medium choke-bored" gun, with a slightly smaller inside diameter at the muzzle than at the breech.

As far as the recoil is concerned—but Terry Bull is speaking again:

"Well, Swenson, if a gun hits four times as hard on the front end, what is it going to do at the— Let's see, the riflings used to try to hold the bullet back, so the gun kicked back harder—but the bullet went out half as fast so it kicked softer. We're using about the same powder charge, so— We'd better see the lieutenant about that—"

SARGE! I *am* disappointed.

It's much simpler than all that; I happen to know a few formulae about recoil and rocket thrust. The

formula in question is as simple as can be. It reads  $MV = mv$ .  $M$  is the mass of your bullet and the powder charge,  $V$  is the muzzle velocity. The other, lower-case  $m$  is the mass of your gun plus the empty cartridge shell, and  $v$  is what you want to know. Well—

If they should need an improved land mine in the Mungo War, I can offer a suggestion. It is a mine specially designed for use against personnel, as the army puts it euphemistically, not against tanks. I like to state at the outset that it is not my idea. I read it many years ago in an old copy of a German journal, dating back to the last year of the World War. While failing to recall the name of the author of that article, I do remember that he claimed to have had access to original test reports, that were made presumably in some German military laboratory.

That land mine is really a one-shot superheavy mortar. It consists of two cylindrical shells, one inside the other. The outside dimensions of the whole mine would be about two feet six inches in length—height—and two feet in diameter. The outer shell consists of a fairly heavy steel cylinder with a base plate of a larger diameter. That cylinder contains four things: an electric detonator, a small powder charge, about six feet of sturdy chain or wire rope and the mine itself.

The mine consists of another cylindrical shell with heavy top and bottom plates. There is a powerful explosive charge—also cylindrically shaped—in its center, but that charge takes up only a small part of the space inside the mine. The remaining space is filled with steel balls and the cylindrical wall is grooved



like the outside of a "pineapple," only that the grooves are on the inside in this case.

The chain or wire rope connects the base plate of the outer shell with the base plate of the mine and its detonator.

Mines are not designed for a warfare of constant movement; they are to defend a definite position. This special type is no exception from this rule. When the defending troops have selected their position, they bury as many of these mines on and near the approaches to their strong points as they can manage. Each mine is buried just deeply enough for its upper surface to be flush with the ground, with perhaps an inch or two of dirt on top for camouflage. Each mine is wired and connected to a central firing post from where the officer in charge has a good view of the mine field.

The mines cannot be exploded any other way than electrically, except, possibly, under the impact of a chance hit with an artillery shell or an airplane bomb. They do not explode when an enemy tank passes over them and they are not exploded when that happens; there are ordinary automatic ground mines scattered around for that purpose. The firing officer is supposed to wait until, during an attack, enemy tanks have passed over the mine field and the mines are surrounded by foot soldiers or motorcycle troops. Not until then does he fire his mines, all of them or only a few, as he deems best.

The contact he closes does not explode the whole mine; it merely fires the small powder charge in the outer cylinder. The mine, still unexploded, is thrown into the air, as far as the chain or wire rope will

permit. This brings its center to about five feet above the ground. When the chain is fully stretched it explodes the detonator in the mine which, in turn, sets off the explosive charge. While the explosion of an ordinary ground mine takes place in the ground and, therefore, acts mainly upward, the explosion of this special type takes place in midair. Due to the heavy top and bottom plates of the mine, the force of the explosion acts mainly horizontally, filling the air with flying steel balls and splinters for hundreds of yards.

It is evident that this mine was conceived during the World War, when attacks were made with massed infantry formations. Then a deep field of such mines, carefully used, would have been a terribly effective defense. Now, where the initial attack is carried out by armored units, such mines would be much less effective, but they would still be useful at least for delaying actions.

This might be the reason why these mines, of which experimental models are said to have been built and tested late during the World War, have not been manufactured and employed recently.

It would be easy to write, with the help of twenty pounds of assorted illustrated magazines and Sunday supplements, an endless list of new and marvelous weapons that only have to be invented. It would be an appalling waste of space and time, because the vast majority of them never could be invented. Only a very few of such new ideas are so close to reality that they might easily become reality one day, and of all I have seen those described by Terry Bull are the ones that are nearest to flawlessness.



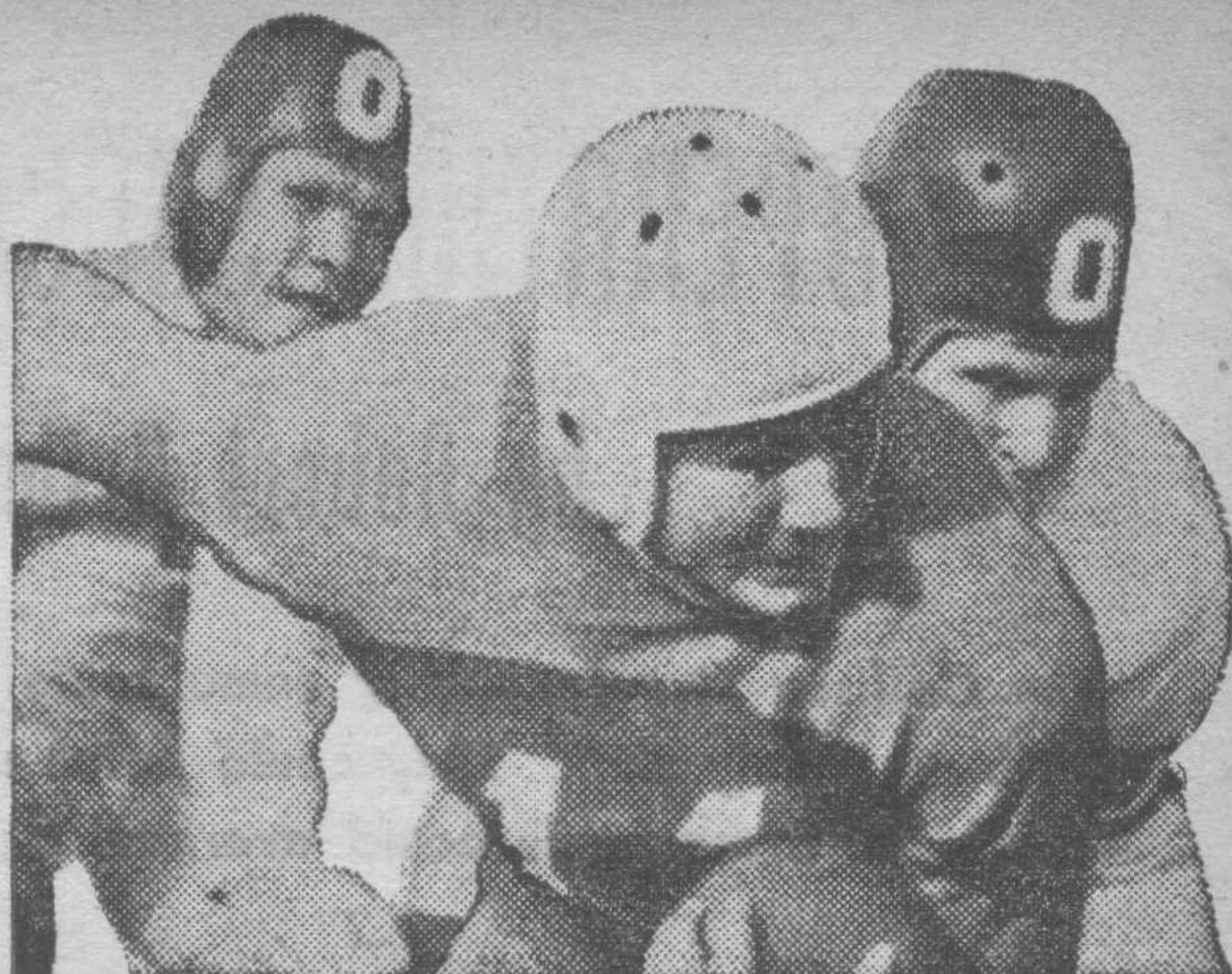
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# OPERATION SUCCESSFUL

by Robert Arthur

*The Callisto Tweeters were remarkable birds—surgeon birds with an unholy skill. They could patch up a human wreck as neatly as a mechanic could overhaul a smashed spaceship—*

Illustrated by Edd Cartier

LIEUTENANT MIKE DEVANS, Space Patrol, detached from New York base on special operation—all SP jobs were “operations”—and returning with operation successful, yawned and lit a forbidden nightberry cigarette. With his other hand he punched a series of course-adjustment controls, and while he was getting the slow-burning nightberry grass alight, the *OP 17*, fast two-man patrol boat, swung ten degrees and put the great crimson crescent of Jupiter off her starboard jets.

Mike Devans puffed a pink smoke ring at his control panel and relaxed. He had Dr. Nelse Banning, research botanist, in chains, and in five days, or thereabouts, Dr. Nelse Banning would be stepping into the gas chamber at New Sing Sing. To celebrate which, and his own forthcoming marriage to twenty million bucks as well, Mike Devans would simultaneously be setting 'em up in Tony's Submarine Garden, which was sunk in a hundred feet of water ten miles off Atlantic City, outside the city's jurisdictional limits.

Tony's had an inside pressure of two atmospheres, and the air as it was circulated was given a vapor content from a mixture of water and nightberry extract.

A man could buy drinks in Tony's, and anything else he could pay for. But it wasn't necessary. The nightberry in the air entered his blood directly under the extra pressure, and gave him as much of a jag as an ordinary guy could stand, with a big saving of wear and tear on his stomach, kidneys and liver.

Tony's was very much out of bounds for any SP officer or man. But Mike Devans considered a place out of bounds for Mike Devans only when it was located somewhere beyond Pluto. And he didn't know any places that were.

He drew in another lungful of smoke, satisfiedly, and watched the yellow dot that marked Callisto move across his plate. The *OP 17* would cut past within five thousand miles of Callisto. The grav would be just enough to pull him around, and when he had gotten free he would have Earth's three-day-off position dead in his teeth. It was nice navigating. Saved two thirty-five, picked up two hours in elapsed time, and was the mark of a master navigator—which was what that little silver bar on the front of his gray-green jumper indicated.

Callisto steadied on his plate, not more than two degrees off the hair-





*Nelse Banning threw the thing with deadly accuracy.  
The meteor did the rest to the now pilotless ship—*



line marking his course. But he knew what he was doing, and wasn't worried, though he was cutting in half the usual margin a pilot allowed himself, passing Callisto. For it was not a nice place to crash. Crash victims were the special joy of the Callisto tweeters, or surgeon birds as the old space hands had nicknamed them. If there was a decent spark of life left in you after a wreck, the tweeters' uncanny skill would save you—but they had a bad habit of not putting you back together the way Nature made you.

The nightberry was working into his blood now, and Mike Devans was feeling good. He felt like talking. Boasting. Telling the world just how good Mike Devans really was. A psychologist could have told him that a deep-seated inferiority complex was stirring in him, as it always did when Dr. Nelse Banning was anywhere near. But Mike Devans, having gotten through the Academy more by concentrating on football than on books, had no interest in psychology.

He looked at himself in the polished surface of the visiplat, and blue eyes in a bronzed grinning face looked back at him. Above the face was neatly trimmed hair, bronze, too. Beneath it showed wide shoulders with a muscular perfection that made the issue jumper look like a two-hundred-buck tailor-made.

Mike Devans was good, and he knew it. Good-looking, a master navigator, able to drink any two men he'd ever met under the table, and smart, too.

He chuckled to himself. It took a smart guy to marry a girl with twenty million bucks to her credit, especially when she was beautiful, and was in love with somebody else, anyway.

A guy like Mike Devans, who could outwit even the iced-lightning mind of a botanist named Nelse Banning—

THERE was a sound behind him, and Mike Devans spun the navigator's chair with a thrust of his toe.

On one of the two bunks at the rear of the long control room, a man lay, twitching as though in troubled sleep. It wasn't his patrol mate. Although the nominal crew of an OP boat was two, Lieutenant Mike Devans had maneuvered to travel alone, going out to Saturn. Coming back, though, he carried a passenger. A passenger whose right ankle was attached to the steel wall by a fifteen-foot chain, light as manila, but strong enough to hold two tons dead weight.

As he watched, his passenger mumbled something, sat up, and opened his eyes. He rubbed them, once. Then quite steadily he stared at Mike.

Dr. Nelse Banning did not appear to have to look around to take in his surroundings. It was as if one glimpse had told him everything—his whereabouts, that he was a prisoner, and that he had no more chance than a fly on flypaper of getting free until Mike Devans was ready for him to be free.

Nelse Banning looked at the big man who, a dozen years before, had been a schoolboy with him. His last memory was of pushing through the vicious tangle of sucker weeds and arrow trees that made up most of the unpleasant weed jungles in the Deep Holes on Saturn's satellite, Dione. He'd been looking for colonies of the bar-fly plant, searching for the characteristic pink vapor clouds hanging over them, when he'd heard the step behind him.



He'd turned only in time to see Lieutenant Mike Devans bring up the juice gun—electric-shock pistol—and then he'd blacked out.

"How long have I been unconscious?" Nelse Banning asked at last, his voice even.

"Three days, Nelse," Mike Devans answered, grinning at the smaller, slighter, dark-haired scientist. "We're already inside Jupiter. I gave you a ten-percent jolt, but you crossed me. You jumped me, and got a heavier sock than I'd planned."

"It's a new tradition in the Patrol—trying to shoot a man from behind," Nelse Banning said, in the same even, almost interested tone.

Mike Devans gestured with the nightberry cigarette.

"Let's not worry about the Patrol, Nelse," he said easily. "I won't be with it much longer, anyway. It's traditional that a man resigns when he marries, you know."

"So?" Nelse Banning's eyebrows rose. "You're going to be married?"

"Take a look at the lucky girl," Mike invited, with a sweep of his hand toward a life-size photo of a girl's head, on the cabin wall.

It was a three-dimension-effect job, so real that the girl seemed to be actually there, smiling at Nelse Banning in the way that had always made his pulse pound, even when he was only a schoolboy and she a brat in pigtails.

Janice Lansing, who was beautiful by any century's standards of beauty; Janice Lansing, whose father, old John Lansing, had made his twenty millions honestly, as royalty on the Lansing Space Drive. Janice Lansing, who'd already been making plans for her marriage to Nelse Banning before he had left on his hurried field trip to Dione.

Nelse let his gaze come back to Mike Devans' face. If the big man

had hoped to surprise him into indignation or outraged anger, he failed. Nelse's lips tightened, but his voice remained even.

"All right," he said. "I know you wouldn't be doing this without legal justification—or pretext. Whatever it is, it must be pretty bad if you're so sure it'll turn Janice against me. Have your fun. Go ahead and tell me the details, so you can gloat over them."

MIKE DEVANS' grin turned a little sour. Nelse Banning had called his shot accurately. He always had, even as a boy. In schoolboy arguments or fights, Mike Devans could always wallop Nelse into a pulp—but Nelse could always make him look like a fool. Mike Devans had never liked being made to look like a fool.

He hadn't liked having a girl they'd both grown up with prefer Nelse Banning to him, either, even though she was tremendously attracted by Mike Devans' vital good looks. Especially a girl he'd set his heart on years ago, even before he'd realized she'd some day inherit twenty million bucks.

"All right, Big Brain," Mike said sardonically. "Here's the facts. You've got three days in which to think yourself dizzy, trying to get around them. And I can tell you now, you won't be able to.

"The night you took off, a couple of weeks ago, you called at John Lansing's home about ten o'clock in the evening. You were pale and excited. You saw Janice only for a couple of minutes, though you'd only been engaged three days, and all you'd tell her was that you were taking off on a field trip, but couldn't tell her where.

"You talked loudly and excitedly—the servants heard you. You said



you had to see Lansing, and the butler showed you into his den. He heard you lock the door behind you.

"You were in Lansing's den more than half an hour. The butler heard voices raised, and worried because Lansing hadn't been feeling well; he listened.

"He heard you yell, 'You old pirate! If you think you can—'

"Then he heard Lansing answer, in an angry voice, 'You listen to me, you young blatherskite! So you think you're going to marry my daughter and have twenty million to play around with when I'm dead, do you? Well, you'll never see a cent of it—'

"Then Lansing lowered his voice, so the butler couldn't hear any more. Ten minutes later you hurried out, closing the door behind you. You were pale, and you forgot your hat. You hurried out without even saying good-by to Janice, and drove straight to the spaceport.

"There you paid fifty thousand dollars to a representative of the North American Space Boat Co., which was unpaid balance on your new lab ship. He was there to slap a writ on you if you took off without paying, or without assigning the company an interest in anything you might discover to recompense them for the risk they took in letting you pilot an unpaid-for boat outside the regular lanes.

"You'd said you'd make the assignment. Instead you paid in cash and at once took off, without clearing for any definite destination."

Mike Devans paused, ground out the stub of his nightberry cigarette.

"How do you like it so far?" he asked.

"It's perfectly simple to explain so far," Nelse Banning told him, a little puzzled, but not showing it. What was Mike Devans building up

to? Everything he'd said was true, of course. That night he, Nelse, had hurried to John Lansing's home because he had just stumbled on something big. He probably had been pale and excited.

He'd been in the lab, working with a leaf from a bar-fly, or insect-intoxicating plant, found only on Dione, and accidentally he'd dropped a little extracted juice on a culture of cancer cells. And the cancer tissue had promptly died!

It was the first hint the bar-fly plant had any medicinal value. If it really was a cancer cure—well, the future would gratefully remember the man who made it usable.

With Nelse Banning, thinking and acting were usually simultaneous. Under the law, it was possible for a private company to stake claims on territories where valuable or unique plants grew. If anyone cornered the limited growing territory of the bar-fly plant, it meant immense wealth for the claim staker, extorted from mankind's pain and anguish, if the plant did prove up as a cancer remedy.

Nelse wanted the claim for the medical-research foundation he was planning, which John Lansing had agreed to finance, and which might some day make old age the only fatal disease. So he had hurried to Lansing to tell him of the discovery, and that he was leaving that night to investigate the plant's growing territory in the Dionian weed jungles, and to stake out comprehensive claims on it.

He'd mentioned the fifty-thousand-dollar claim against his ship, and Lansing had insisted he take fifty thousand from the small safe in the den to pay it, arguing that all rights in any discovery so valuable must be reserved for the foundation. They'd had a friendly argument over



it. Nelse Banning had an almost morbidly sensitive awareness of the wealth of Janice's father—wealth he would inevitably be accused by the spiteful of seeking to marry. He'd even been willing to assign a small interest in his unexpected discovery, to avoid seeming to seek money from Lansing.

But the red-faced, bluff old hell-roarer had called him a nincompoop and a blatherskite, questioned his sanity, and forced the money on him. He'd taken it from the safe at Lansing's direction, and written out a receipt in which he had signed over to the Lansing Foundation all rights in any claims he staked out on the satellite Dione.

Then, because he had to make the payment by midnight to keep the writ from being served and tying him up several days, he'd hurried off, forgetting his hat and not even saying good-by to Janice. Immediately on freeing the ship, he'd blasted off for the Saturnian System, having told no living soul, except John Lansing, his destination.

A new thought came to Nelse Banning, that made him sit up abruptly to stare in Mike Devans' eyes. How had the Space Patrol man found him so quickly? John Lansing certainly wouldn't have told his whereabouts. Lansing did not like Mike Devans. He knew men, and instinctively, without knowing any details, he distrusted him.

MIKE DEVANS lit another cigarette and leaned back, put his feet up on a chart rack.

"Now," he said, "we come to the interesting part, Nelse. So open your ears wide.

"It happened I was at Lansing's when you left. I'd dropped in to say hello to Janice, and since you were ignoring her, she plugged in the

music library and we were dancing to some old twentieth-century records—it's a new fad, though a lab crawler like you wouldn't know it.

"Half an hour after you'd gone, Lansing still hadn't come out of his den, or rung. At last the butler, worried, looked in. Lansing was slumped in his chair, chin on his chest. The butler felt his pulse. Lansing was dead."

"Dead!" The word burst from Nelse Banning in anguished horror.

"You should know, Nelse." Mike Devans' grin was twisted. "You see, the butler rushed in to tell us. I went to her father's den, while she phoned for Lansing's own doctor, who lives in an apartment of his own in the house. The doctor got down five minutes later, but could do nothing.

"Lansing had been dead half an hour, according to the doc—or since you'd left. His safe was empty, though his secretary testified he'd put fifty thousand dollars in it that day, drawn from the bank at Lansing's orders. Lansing liked to have cash on hand for emergencies, he said. The bank identified the bills you paid the Space Boat representative as the same bills it had passed out to Lansing's secretary.

"The doctor diagnosed heart failure, but in view of everything—and because I rather suggested it—an autopsy was made. The finding was negative—until I suggested a spectroscopic analysis. Then they found traces of something in the tongue tissues nobody could identify.

"A couple of your research friends, called in, finally placed it as evanasin, a highly volatile extract from the leaf of the Venusian bird catcher or gas tree. Evanasin has the property of stopping the heart of an animal—or a man—within five seconds after a drop of it has touched any



mucous membrane. And it isn't chemically detectable. Even for a spectroscope to find it, the test must be made within six hours, it seems.

"And you, Nelse, are the only man successfully to extract evanasin. While the only known quantities of it, aside from a few vials you gave to two or three scientists for experimentation, are to be found in your lab safe."

Mike Devans stopped. Nelse Banning was paler now, and the muscles along his jaw were bunched. He hadn't seen, before. Now he did. Clearly.

"All right," he said, a note of harshness in his voice. "You might as well finish it off."

"The cops were called, and brought in a mechanical bloodhound," Mike Devans told him, enjoying himself immensely now as the nightberry sang in his brain. "They applied it to the safe. Your distinctive body odor clung to it. So they knew you'd opened it."

"They followed you, and just outside the grounds found the handkerchief you'd used to wipe the safe with. The hanky had your odor, a trace of oil, a dab of ink, a faint trace of John Lansing's body scent, and a detectable amount of evanasin."

"Then they had the picture complete. In the course of a quarrel, being fearful that Lansing would keep you from marrying Janice, and needing fifty thousand badly, you must have taken a vial of evanasin from your pocket, concealed it in your handkerchief, uncorked it, and applied it suddenly to Lansing's lips."

"He died without a struggle. You expected it to look like heart failure. You removed the money from the safe, wiped it clean, closed it, and hurried out. In your nervousness you forgot your hat, and you dropped your handkerchief."

"That's all there was to it. They knew you were guilty within a day after you'd left. The Patrol got orders to find you and bring you in. I . . . ah, I was assigned to look for you in the Saturnian System. Where, by great good luck, I found you."

"So in three days I'll turn you over to the cops and send in an OP successful report. You'll be tried the next day, sentenced, and executed within twenty-four hours. You haven't a chance, no matter what story you tell."

"It was slick—but the evanasin will do you in. You're known to have a razor-sharp mind. So no attention will be paid to any story you tell, no matter how reasonable or how fantastic. You might even be crazy enough to claim you're being framed. But that won't help you."

"It won't do you any good to give up and plead insanity, either. You know that under the new Unified Code, execution is the penalty for either murder or manslaughter, and neither illness nor insanity can delay or prevent your going into the gas chamber. There are times when that seems too rigid, aren't there, Nelse? But the Martian jurists insisted on it, and so we put the provision in in order to get the code ratified. And they wouldn't like it if they found us weasling on any of the statutes, either. They might start in doing the same."

"So, there you are, Nelse. Chew on it awhile, and see where it gets you."

NELSE BANNING was silent for a long moment. His anguish was keen at the thought John Lansing, bluff, bullying old man with a heart of gold that he had been, was dead. But he did not need to chew on his own predicament. He had weighed every word and fact as Mike Devans



uttered them, and he knew as soon as the big man had finished that his position was the next thing to hopeless.

"I see," he said at last, slowly. "Clever, that use of evanasin. I suppose you read my notes on it, one of those times you brought Janice to the lab to pick me up and we all went out for a swim together.

"And once I had some vials ready that I was sending out to researchers, and missed one later. But I found an empty vial, broken, on the floor, and figured it had rolled off and the evanasin vaporized.

"So you took it that time just on speculation, eh, Devans? Just on the chance it might come in handy sometime. And it did. Your speculation looks as if it's going to pay off big dividends.

"It's easy enough to reconstruct. While the butler dithered around, you snatched up the handkerchief I used to wipe ink off my fingers when I made out the receipt for the fifty thousand.

"The receipt itself you stuffed in your pocket—it told you where I'd taken off for. You poured a few drops of evanasin into Lansing's mouth—of course, he had died of heart failure, just after I left, probably. The still-moist tissues absorbed it.

"Then you put some on my handkerchief, after you'd wiped the safe with it, and later you dropped the handkerchief where it would be found. All in all it didn't take you five moves, plus a few adroit suggestions to the police, to make John Lansing's death into a murder and me a murderer."

Mike Devans blew a pink smoke ring toward him.

"How you do talk, Big Brain!" he mocked. "Is that what you're going to tell them? They'll know you're a

loony for sure. Space Patrol men just don't *do* things like that. After all, we're practically little tin gods."

"Yes," Nelse Banning agreed, his eyes dark as he stared, not at Mike Devans, but at the control board beyond him. "But even a tin god can't hit nightberry. It gets into the brain and permanently distorts the moral sense, produces delusions of grandeur, and brings about a conviction in the user that everything he does is right. And you, I know, started in on it as far back as prep school.

"However," he added, "Janice will believe me. She'll remember how easily you could have stolen a vial from the lab. And she'll testify to it, too."

"Maybe she would," Mike Devans yawned, "if she hadn't had a nervous breakdown and been under the care of the doctor, in seclusion, ever since the night her father died. She's expecting to talk to you when we bring you in, but for her own sake we've all agreed it's best she shouldn't know of your return until after the trial and execution."

Two spots of color began to burn in Nelse Banning's cheeks. That closed the last avenue of hope, then. Without Janice's help he was inevitably doomed. Justice under the new code, modified in many ways to fit the circumstances prevailing on other planets besides Earth, was swift and deadly. Too much so, of course, and in time the code would be liberalized. But that wouldn't help him now.

Mike Devans, in a few swift motions, had doomed him to death. The motive needed no seeking. There was Janice herself, and her money. There was the old boyhood hatred that had shown in Mike Devans' eyes when Nelse had consistently outshone him in every intel-





*"It is the be-rain that is im-por-tant," announced the Tweeter. "We say-ved that."*

lectual activity. And there was the addiction to nightberry, which in itself was answer enough.

NELSE BANNING rose to his feet and jammed his hands into his pockets. He had been watching the illuminated control board, which the big man had been neglecting, and he had made his decision. He knew already what he was going to do. But he had another minute or two to kill before he could act.

There was nothing in his pockets except a slightly mashed fruit ball—a compressed mixture of fruits and nuts the size of a peach, a light, con-

centrated energy meal that he was fond of. Devans had removed everything else.

Nelse Banning took out the fruit ball and bit off a chunk of it.

"All right, Devans," he said as he chewed. "I admit my case is hopeless. You've seen to that, and cleverly, too. But it's you I'm really sorry for. You started out with magnificent equipment—brains better than average, and a body equal to two men's.

"You could have done tremendous things for the world—if you hadn't had the streak in you that led to becoming a nightberry user. If I



had your physique, I could do twice what I do now. It takes tremendous stamina and strength to explore the outer planets and their moons. You could have made an enduring name for yourself in that field.

"As it is, you'll marry Janice, squander her money, wreck your health with debauchery, and wind up a burned-out psychopathic in five years—if we reach Earth."

"A pretty picture," Mike Devans told him, unruffled. "But it's *when*, not *if*."

"If!" Nelse Banning corrected sharply. "Since I'm as good as dead when we reach Earth, anything that happens to keep us from reaching there, no matter what, is an improvement. Even to be wrecked on Callisto. Even to be cut up by the tweeters. While there's life, there's hope."

"Brains Banning!" the big man sneered. "Always logical! So what? You can't do anything to keep us from reaching Earth."

Nelse nodded toward the navigation plates.

"That meteorite heading for us might, though," he suggested.

Mike Devans twisted about to look. A small, yellow spot was moving across the plate toward their course line, indicating a meteorite hurtling across their path at a collision angle.

"The mechanical pilot will take us around it," he shrugged. "We'll change course inside of five seconds."

"Yes?" Nelse Banning asked. He held the hard, small fruit ball loosely in his fingers. "In school, Devans, you were a star athlete in every field. But I wasn't a bad pitcher, you remember?"

And he hurled the fruit ball at the control panel, only a dozen feet away.

THE makeshift missile struck squarely the large red button which controlled the automatic functioning of the collision-prevention relays. Only on a take-off, in atmosphere, was that button supposed to be depressed. But it was depressed now, with sticky fruit squashing over it.

A warning gong clanged harshly as the relays were broken. Mike Devans went white as he whirled in the pilot's chair and brought his hands down on the controls. But Nelse Banning, talking as he waited for the right moment, had not fumbled his timing. There was nothing Mike Devans could do that was not too late.

An instant later up forward metal screamed and groaned. The *OP 17* shuddered in every seam and plate, checked for a moment with a jar that slammed Nelse Banning back onto the bunk, and then began to plunge in a great arc down toward Callisto.

Half the lights on the panel were out, indicating jets and drive machinery gone. Air made a wailing, blubbery moan as it escaped through gaps riven in the double shell, and bulkheads clicked shut as automatic pressure locks operated.

Nelse Banning struggled to a sitting position. Blood streaked down his forehead, but his voice was still steady.

"I don't know what happens now, Devans," he said. "Maybe we'll both be killed when we crash. If so, I've saved Janice, anyway—if I haven't saved myself. Maybe we won't be killed. Maybe the tweeters will scramble us up for the fun of it. No matter what it is, I consider whatever happens an improvement on the program you worked out."

The big man did not turn or answer. He was cursing with steady, violent rage as he fought the controls. With half her machinery



wrecked, the spaceboat was as good as a derelict. He worked frantically with the controls that were still illuminated, and for a moment he checked their fall. Then the ship got away from him again.

Sweat standing on his face, Mike Devans worked. But, in spite of everything he could do, they kept on falling. Callisto was looming under them now, visible through the ports as they spun, the deep sheen of her tangled, rocky jungles ever closer.

When the tall tree ferns were almost touching them, Mike Devans caught the jets as the boat spun, and got one last kick that seemed to hang them in the air motionless for a long second. Then they plummeted downward, and struck.

Mike Devans had one brief moment of consciousness after that, in which he realized that the control panel had buckled down across him, and that his body must be almost cut in two. His arms were jammed back against his chest in a curious manner. They must have been broken in half a dozen places. Then he slid down into blackness. He did not hear the shrill tweetering, chirping chorus that sprang up outside the wreck a moment later.

CONSCIOUSNESS returned to Mike Devans as suddenly as it had left him. Consciousness and memory came back together like the turning on of a light, and he gritted his teeth, waiting for the waves of pain that must follow.

But they didn't. He felt nothing. He remembered the glimpse he had had of the twisted control panel pinning him down, of his distorted arms and crushed body, and knew that agony ought to be flooding him.

Bewildered, he opened his eyes. And for a moment was even more bewildered. He was in the ship, all

right. But not lying under the wreckage of the panel. He was lying on a bunk, in one of the storerooms.

There were no sheets over him. His body was incased in a long, gray, rubbery bag that ended in a puckered neck around his throat. With his chin he could feel lacing there. But inside that bag he was—whole!

In amazement he wriggled his fingers and toes, tensed the muscles of his stomach and thighs, and felt no pain. He could not sit up, or do much more than move his limbs a little, because the bag was evidently designed to prevent bodily movement. But he wasn't dead. He wasn't even, as far as he could tell, injured!

He wasn't required to wonder who had rescued him from the crash and cared for him. Before his mind had turned to that, a shrill tweetering sounded outside the small vent grille of the closed storeroom door.

And Mike Devans, his blood running cold, knew. Knew before the door opened to admit half a dozen Callisto tweeters—bird men, or, anyway, once-flying mammals. Their one-time wings were now just stunted appendages, something like a seal's flippers.

They crowded in and surrounded him, six of them, their large globular eyes peering down at him, high piping whistles coming from their horny mouths, the six feelers that made a semicircle across their heads above their eyes writhing and twisting and intertwining in excitement.

Four feet high, perhaps, they stood, with bony legs not unlike ostriches', and their plucked-chicken bodies were covered with a soft, gray, rubbery material similar to the bag that incased Mike Devans.

Grouped around him, they all tweetered at once, flippers and feelers wagging and eyes rolling, as if



in the grip of great excitement.

Surgeon birds, the old space hands had named them, and told tales of them to chill a green hand's blood. They were the master surgeons of the Universe—and as irresponsible as so many parrots. Working with those six feelers, each of which was tufted on the end with prehensile, wire-fine "fingers," they could cut into anything living and scramble it around until its own mother would have fled in horror from it. Leaving it working, too, in perfectly good health.

They did it for fun and curiosity, with no trace of malice. When they couldn't get anything else to operate on, they operated on each other. Mike Devans saw that one of the six had half a dozen extra feelers on the top of his head, and a second had not two eyes but eight, spaced evenly around his birdlike cranium. A third had lost his flippers; crude but workable manlike arms replaced them.

When the first spaceship had been wrecked among them, their curiosity concerning the new form of life it contained had been unrestrainable. One poor devil had been rescued after a group of surgeon birds had worked over his brain. His eyes had been connected up to his sense of touch, and his ears to his sense of taste. His fingers had been connected with his visual center, and his center of hearing to his taste buds.

When he touched something, he saw flashes of color, and when he ate steak bells rang in his head. Bright lights felt like tacks, and soft lights were slimy. Human speech tasted like Epsom salts.

Otherwise he had been in fine health.

Later two explorers had been wrecked in a small auxiliary job. One had been smashed up unrecogniza-

bly. The other was dead with a hunk of iron through his heart. The surgeon birds had taken the still-beating heart from the mangled one, interchanged it with the useless heart of the otherwise unhurt spaceman, and sent back one perfectly sound individual out of the two casualties.

But whatever they did was as the whim struck them, and the most stringent penalties had been invoked to teach them to keep their hands off the miners and prospectors who made up Callisto's small human population. So by now they had more or less learned their lesson. They weren't apt to cut up any man whom they didn't find injured to begin with, and half the time, even then, they were satisfied with patching him up and making him good as new just for the fun of it. The worse he was hurt, though, the better they liked it.

Remembering this last fact, which had come through only in a recent SP memorandum, Mike Devan's chill began to pass. They were still just staring down at him and tweet-ering, and they seemed friendly. They were the answer to the miracle of his being alive. Attracted by the crash, they must have found him mangled almost hopelessly, and they'd gone to work on him, done miracles, and put him back in working order again.

Had they patched up Nelse Banning, too? It didn't matter. At best, Nelse had only won a slight reprieve from death.

MIKE GRINNED at the silly-looking creatures, and to his surprise the one with eight eyes spoke in an understandable if whistling voice. More self-surgery!

"You are perfect-ly well!" the tweeter told him, trying to look at him with all eight eyes at once, which



was impossible. "Today you can arise."

"Thanks, space cat," Mike Devans answered. His voice was strange in his ears because of the neck of the bag tied around his throat. "Was I in bad shape?"

The eight eyes, or all he could see, glinted happily and rolled around in their sockets.

"Ve-ry bad!" the tweeter chirped. "Man-gled!" It got the word out with ghoulish relish. "But your be-rain was un-hurt. It is the be-rain that counts."

"You bet it is, Tweetie, old blaster," Mike Devans grinned. "Especially my be-rain. But what about the other guy?"

"Your fur-end," the eight-eyed tweeter told him, "was vu-ry bad. His be-rain was cur-ushed. So first we made sure you would li-uv. It is the be-rain that counts."

"Uh-huh," Mike agreed, beginning to get impatient. He wanted to get out of the damned bag and stretch himself. His arms and legs were beginning to prickle. "But is he still alive?"

All the tweeters chirruped and whistled then, showing signs of pleasure. Eight-eyes silenced them.

"Ye-yus," he shrilled. "We sa-yuved him. The be-rain was cur-ushed only on one side. The undevel-oped side. We took out the dam-uged cells and his be-rain will be as good as ev-er. So will your bo-dy. We are ve-ry proud. We did not think we could sa-yuv his be-rain, or your body, they were so bad-ly dam-uged. But we en-joy-ed try-ing, and we di-yud. Both will be as good as ev-er. May-be bet-ter."

Again all the tweeters chirruped, as if echoing approval of their own feat. Mike Devans shifted restlessly.

"That's navigating, space cats," he said. "Especially that part about saving my body. After all, the be-rain may be the most important, but the body has the most fun. Now how about getting me out of this strait jacket?"

He was impatient to be up. He wanted a nightberry cigarette, and he wanted to get at the radio, to signal one of the mining camps that must be within a few hundred miles to send a rescue boat. And he was anxious to get started back for Earth again, where Janice Lansing and twenty million bucks were waiting. As well as Tony's Submarine Garden, where a pair of red-headed twins—

"The ba-yug," the eight-eyed tweeter was saying, "was so you could not move while you heal-ed. You have been un-con-shus two weeks. But now you are we-yul. You wi-yul not even find a scar. Our med-icines he-yul quick, and we are very skill-ful."

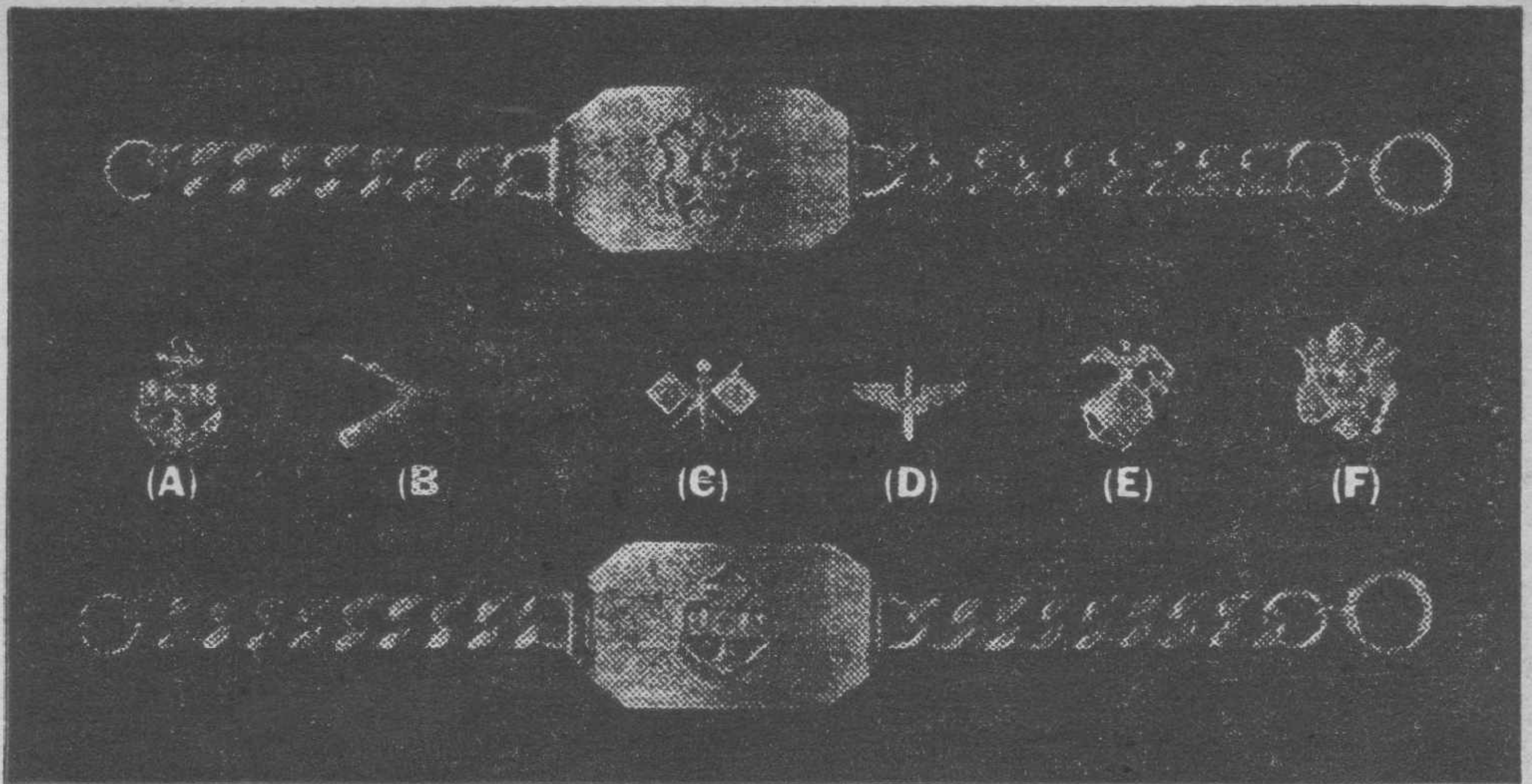
"Sure, sure," Mike Devans rasped. "But if I'm well, hurry up and let me out of this."

The tweeter with the more-or-less arms detached himself from the group and began to fumble with the tie string of the bag, at Mike Devans' neck.

"Your fur-end," Eight-eyes said, "is sti-yul un-con-shus. It wi-yul be sev-ural weeks before he is con-shus again. The body is we-yul, but the be-rain must have ti-yum to he-yul itself. In ti-yum he wi-yul wake of his own accord, and be as we-yul or bet-ter than ev-er."

"That's what you think," Mike Devans grunted, grimly, shifting with increasing impatience as the tweeter fumbled at the bag with inefficient fingers Nature had never meant it to have. The big man had already decided that for Nelse Ban-





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ning to die now was the easiest and most logical thing. A tap on the head would probably be enough. As soon as the damned tweetering monstrosities took themselves off—

“Come on, open your jets!” he snapped, as the drawstring still did not loosen. He turned his head. “Where is the other guy?” he asked Eight-eyes.

“In the next space.” The tweeter nodded toward the other storeroom, beyond the steel bulkhead toward the control cabin. It hesitated for a moment. Then it whistled, “When you ex-play-yun to your fur-ends how you were say-ued, it may be har-ud for them to bul-eave you. Do not be sur-prised. It has nev-ur been done be-fore; but we have wonder-ful skill,” it finished modestly.

“Huh?” Mike Devans scowled at him. “What’re you talking about?”

“We—” the tweeter began, and then unexpectedly from outside rose a whole chorus of shrill pipings. The tweeter trying to unfasten the bag incasing Mike darted for the door. The others scuttled after him. Only the eight-eyed leader paused for an instant.

“A shi-up is land-ing,” it shrilled. “Your fur-ends have come. We can not stay. It is for-bid-un for us to touch men. They will pun-ish us if we stay. But they will not find us. Do not be ang-ry. We just want-ed to be sure. It is the be-rain that is im-por-tant.”

Then the creature darted out the door and was gone. Mike Devans heard bony feet scuttling down the passageway, then a shrill whistling that died away in the distance. It was replaced by the drum of a space boat’s jets as she landed nearby.

If it was two weeks since the crash, the ship landing was probably an SP craft, coming out to look for

him. Mike Devans drew in a deep breath of satisfaction. In an hour he’d be heading Earthward. In three days he’d be—

Footsteps clanged in the control cabin, and he heard voices.

“What a mess!” someone said. Then:

“Here he is!” a second voice called. “In here. Somebody’s patched him up. Take a look, doc.”

There was silence for half a minute. Then a crisp, authoritative voice said:

“Heart sound. Seems in good shape. Expect he’ll wake up of his own accord in time. Must have been the tweeters took care of him. Last general bulletin said they’d mended their ways a lot, and weren’t doing any tampering these days.”

Footsteps came down the corridor, then a blond man in the uniform of an SP lieutenant turned into the storeroom where Mike Devans was waiting impatiently. Mike didn’t know him, but the SP force was big.

“Welcome to my parlor!” Mike Devans grinned. “Mike Devans, lieutenant Space Patrol, commanding this offspring of a mating between a patrol boat and a meteorite. How’s for helping me out of this laundry bag?”

The blond lieutenant stared at him. Then, without answering, stuck his head out the door.

“Oh, doc,” he called. “Come in here, will you? You, too, sergeant.”

In a moment he was joined by a short, roly-poly man wearing a doctor’s caduceus on his jumper, and carrying an instrument bag, and a burly SP sergeant. Together they stared at Mike.

“Say, what is this?” he snapped. “Even if we’ve never met before, you must have had a description and pictures of me. Mike Devans, lieutenant. In a collision with a



meteorite and crashed, returning fugitive to Earth after capture in Saturnian System. He's in the next cabin. Dr. Nelse Banning. Wanted for murdering John Lansing. Or haven't you heard?" he finished sarcastically.

"Head injury, I'd say," the roly-poly doctor said in a low voice to the lieutenant. "Delusions. I'll check for a fever."

He approached the bunk and fumbled in his bag. Mike Devans glared at him, enraged.

"Say?" he demanded. "Are you guys space-screwy? Let me out of this bag."

He threshed and twisted, trying to sit up, and his struggles half turned him, so that he was facing the steel wall. And abruptly his movements ceased. On the wall was a card of printed regulations concerning the stowage of stores aboard patrol boats. The glass face of the card made a passable mirror, and reflected his image.

But not his image. The face it was reflecting was the face of Dr. Nelse Banning.

Then Mike Devans knew. At last the tweeter's words made sense. "Be surprised—" "Never been done before—" "Hard for them to believe—" "Just wanted to be sure—"

His uninjured brain—Nelse's uninjured body—the damned surgeon birds had combined them, to make sure of getting one living man out of the two of them! Then they had gone to work, combined Nelse's injured brain and his own smashed body—and with inspired skill, mended the injuries of body and brain, saving Nelse, too—giving him a new body, and better than the one he had had before—Mike Devans' body.

So now he was Nelse Banning,

and Nelse Banning was he. Because the tweeters, the damned and double-damned tweeters—

Mike Devans rolled over, and his eyes were bright with terror.

"No!" he choked. "Listen! Let me tell you. I'm not Banning! I'm not! I'm Devans. This is how it was. This is what happened—"

He heard his voice—Nelse Banning's voice—going on and on. Shouting, yelling, imploring. But they were not listening. He had to pause for breath, and the roly-poly doctor took the opportunity to murmur to the blond lieutenant:

"Mad as a Martian bongo, I'm afraid. The violent language suggests a nightberry breakdown. If he's a user, that would explain his killing Lansing. Anyway, mad or not, he'll go through that door at New Sing Sing."

"No way out of it for him," the lieutenant agreed, looking down at the contorted face of Nelse Banning without sympathy. "We'll just leave him in the bag, eh? Better than a strait jacket. Sergeant, I think you and I can carry him to the ship. We'll bring back a stretcher for Devans, doctor."

He and the burly noncom lifted Mike Devans then and carried him toward the door. Mike Devans began to yell again, to explain, to make clear what the surgeon birds had done. He tried so hard that there was foam on his lips, but still they did not listen.

They maneuvered him through the door, and in the corridor the blond lieutenant raised his voice a trifle.

"Oh, sergeant," he said. "As soon as you have the chance, send in a report to Headquarters, will you? 'Operation successful' will be enough for now."





# HOMO SAPS

by Webster Craig

*Indicating that it may not always be the burden bearer who is the dumber, harder worker—*

Illustrated by Kramer

MAJESTICALLY the long caravan emerged from the thick belt of blue-green Martian *doltha* weed and paraded into the Saloma Desert.

Forty-four camels stalked along with the swaying gait and high-faluting expressions of their kind. All were loaded. Beneath the burdens their



deliberate, unhurried feet dug deeply into the long waves of fine, pinkish sand.

The forty-fifth animal, which was in the lead, was not a camel. It was daintier, more shapely, had a beige-colored coat and only one hump. A racing dromedary. But its expression was fully as supercilious as that worn by the others.

Sugden had the dromedary, Mitchell was on the following camel, and Ali Fa'oum formed the rear-guard of one. The forty-two burdened beasts in between had modest loads and immodest odors. Ali, at the back, got the benefit of the last. It didn't matter. He was used to it. He'd miss it if it wasn't there.

Twisting in his seat, Sugden tilted his head toward the sinking sun, and said, "They'll put on the brakes pretty soon, I guess."

Mitchell nodded lugubriously. He'd sworn camels across Arabia, cursed them through the Northern Territory of Australia, and had oathed them three times around Mars. His patience was no better than on the day he'd started. Within his bosom burned a theory that if there had never been camels there would have been no such thing as Oriental fatalism.

Abruptly the dromedary stopped, went down forelegs first, back legs next and settled with a sickening heave. It didn't bother to look behind. There wasn't any need, anyway. The rest of the cavalcade followed suit, front legs first, hind legs next, the same heave. A box with loose fastenings parted from its indifferent bearer and flopped into the sand.

Ali, now compelled to dismount, did so. He found the fodder, distributed it along the resting line. Ignoring the white men, the animals ate slowly and with maddening de-

liberation, their disinterested eyes studying the far horizon. Ali started grooming them as they ate. He'd groomed them in Port Tewfik thirty years ago. He was still doing it. They still let him get on with it, their expressions lordly.

Lighting a cigarette, Sugden gave it a savage suck, and said, "And they talk about mules!"

Slowly the dromedary turned its head, gave him a contemptuous look. Then it resumed its contemplation of distance. It chewed monotonously and methodically, its bottom lip pursed in silent scorn.

"Same distance, same time," voiced Mitchell sourly. Thumping the heel of his jackboot, he killed a Martian twelve-legged sand spider. "Never more, never less. They clock on and clock off and they work no overtime."

"They've got us where they want us." Sugden blew a twin funnel of smoke from itching nostrils, stared distastefully at what had been the spider. "They're the only things that can cover these deserts apart from the Martians themselves. If we had tractors, we'd use tractors if there was any gasoline on this planet."

"Some day, when I'm bloated with riches," Mitchell pursued, "I'm going to be eccentric. I'm going to get them to build me a superhyper-ultra rocketship. One that'll carry some real tonnage."

"Then what?" inquired Sugden.

"Then start from where I left off here—only with elephants."

"Ha-ha!" laughed Sugden, with artificial violence.

The dromedary turned its head again. It made a squelching sound with its slowly moving mouth. The noise was repeated all the way along the line until the mount of Ali emitted the final salivary smack. Ali



proceeded furiously with his grooming.

Mitchell snorted and said, complainingly, "You'd think the whole darned lot had loose dental plates." He started to open up the thermic meal pack. "And they stink."

"And I don't like their faces," added Sugden.

"Me neither. Give me a cigarette, will you?" Mitchell lit it, let it hang from his bottom lip. "To think the Martians kowtow to them and treat us like dirt. Funny the way they've acted like that since the first camel was imported."

"Yeah, I'd like to get to the root of it sometime."

"Try talking to a Martian. Might as well talk to a gatepost, and—*yeouw*, this thermic's red-hot!" Mitchell coddled his fingers. "Sixty years and never a word out of them. They ought to be able to talk, but won't." He heaved the meal pack onto its telescopic legs, slid out its trays. "Hi, Ali, come and give us a hand."

"No, sah. Finish these first. One hour."

"See?" Removing his solar topee, Mitchell flung it on the sand. "The stinkers first, us last."

THE igloo-shaped lumps of Jenkinsville showed on the horizon at sunset next day. Nobody knew the Martian name of the place, but its first discoverer had been one Hiram Jenkins, originally of Key West, Florida. So from then on it was Jenkinsville. The place was precisely fourteen miles away. Nevertheless, the dromedary squatted and the rest did likewise.

Sugden dismounted with the usual scowl, raked out the usual battered cigarette, heard Mitchell air the usual curse. It couldn't have been a curse of much potency since the

curve on the grief chart remained constant, with never a dip.

The same box fell into the sand again, making the same dismal thump. Phlegmatically, Ali got on with the feeding and grooming rigmarole. In superior silence the forty-five animals rested and masticated and gazed at nearby Jenkinsville much as Sugden had gazed at the squashed spider.

"I've a persistent notion," said Sugden, his sand-chafed eyes on the energetic Mr. Fa'oum, "that he sneaks up at midnight and worships them. First time I catch him I'll prove he can't salaam without presenting his rumps for suitable retaliation."

"Humph!" Mitchell wrestled with the meal pack, burned his fingers as he'd done a thousand times before, let out his thousandth *yeouw*! "Hi, Ali!"

"One hour," said Ali, firmly.

"I'm clinging to life," announced Mitchell, speaking to the general outlines of Jenkinsville, "so's I can outlive the lot. One by one, as they die on me, I'm going to skin 'em. I'll make foot mats of their stinking pelts. I'll get married, wipe my feet coming in and going out and every time the cuckoo clock puts the bean on me."

The sixth camel from the front rumbled its insides. Slowly the rumble moved from stomach to gullet, ended in an emphatic burp. Taking its blank eyes off Jenkinsville, the dromedary looked backward with open approval. Mitchell enjoyed a furious kick at the thermic, denting its side.

"Now, now!" said Sugden.

Mitchell gave him a look of sudden death, twitched a tray from the thermic. He did it wholeheartedly. The tray shot clean out of the container, tilted against his ineffectual



grasp, poured a mess of hot beans in tomato sauce over his jackboots. Ali paused and watched as he brought a bundle of night coats to the complacent camels. Sugden stared at Mitchell. So did Ali. Also the camels.

Looking first at Sugden, then at his boots, Mitchell said, "Notice that?"

"Yes, I've noticed it," admitted Sugden, gravely.

"Funny, isn't it?"

"Not at all. I think it unfortunate."

"Well," said Mitchell, stabbing a finger at the observing line, "*they* think it's funny."

"Oh, forget it. All animals are curious."

"Curious? Hah!" Lugging off his boots, Mitchell hefted them, swung them around, gauged their weight and handiness. All the time his eyes were on the dromedary. In the end, he changed his mind, cleaned his boots in the sand, then put them on. "They're seeing the world at our expense—and they all look at me when I do this to myself."

"Aw, let's eat," soothed Sugden. "We're hungry, and hunger makes one short-tempered. We'll feel better afterward. Besides, we'll be in Jenkinsville early in the morning."

"Sure, we will. We'll be in Jenkinsville first thing in the morning. We'll offer our junk for all the mallow seeds we can get, and if we don't dispose of the lot—as we probably won't—we'll start another one-hundred-mile hike to Dead Plains to shoot the balance." Mitchell glowered at the cosmos. "If, by some miracle unique in the records of Martian trading, we do switch all we've got, we'll start back on our one hundred fifty miles of purgatory

to Lempport, accompanied by forty-four camels, forty-four double-humped skunks."

"And one dromedary," Sugden reminded, delicately.

"And one one-humped skunk," agreed Mitchell. He glared across the sands to where the said skunk was enjoying its own digestive processes with true Arabian aplomb.

"If you're not going to eat," announced Sugden, "I am!" He slid another tray from the thermic, stabbed himself a couple of steaming pinnawursts. He was very partial to minced livers of the plump and succulent pinna birds.

As the food went cold in the Martian evening, Mitchell joined in. The pair ate ruminatively, in unconscious imitation of the camels.

THREE HOURS beyond the flaming dawn the caravan slouched into the market place in Jenkinsville and unloaded with many animal grunts and much Terrestrial profanity. Martians came crowding in, more or less ignored the white men, took a little more notice of Ali Fa'oum, but paid most attention to the camels. For a long time they looked at the camels and the camels looked at them, each side examining the other with the aloofish interest of ghosts discovering fairies.

Mitchell and Sugden let them get on with it. They knew that in due time, when they thought fit, the natives would turn to business. Meanwhile, the interim could be used for making all the necessary preparations, setting up the stalls, displaying the stocks, getting the books and scales ready. Each Martian had his hoard of mallow seeds, some small bags, some big bags, some with two or three.

The seeds were what the traders



were after. From this product of the Martian desert mallow could be distilled—a genuine cure for Terrestrial cancer. This disease would have been wiped out long ago if only the temperamental mallow were cultivatable—which it wasn't. It grew wherever it took the fancy and nowhere else. It didn't fancy anywhere on Earth. Hence, its short, glossy-leaved bushes had to be searched for, and Martians did the searching.

In ones and twos, and in complete silence, the Martians drifted from the camels to the stalls. They were large-eyed beings, with big chests and flop ears, but otherwise human in shape. Though literally dumb, they were fairly intelligent. Terrestrial surgeons opined that the Martian voice box once had functioned, but now was petrified by centuries of disuse. Maybe they were right. Mitchell and Sugden didn't know or very much care. The traders high-pressured their clients in deft sign language, sometimes helped out by writing and sketches.

An old Martian got his bag weighed, was credited with one hundred eighty dollars in gold, solid, heavy, international spondulics. Mitchell showed him a roll of batik-patterned broadcloth and a half-plate glossy photograph of Superba de la Fontaine attired in a sarong of the same material. He didn't mention that the fair Superba was originally Prunella Teitelbaum of Terre Haute. All the same, the old chap liked neither. He pulled a face at Mitchell, indicated that both were trash.

"They're getting finicky," complained Mitchell, addressing the God of Commerce. Irefully, he swung a roll of Harris tweed along the roughwood counter, fingered it, smelled it,

held it up for his customer to enjoy the heathery odor of the fabric. The customer approved, indicated that he'd take three arm spans of same. Mitchell sliced off the required length, rolled it dexterously, tossed it over.

Way down in the Communal Hall beyond the serried rows of red granite igloos a band of tribal beaters started playing on a choir of gongs. The instruments ranged all the way from a tiny, tinkling silver hand disk up to an enormous copper cylinder twenty feet in diameter. Every note was powerful and pure, but the tune was blatant torture.

Scowling, Mitchell said to the old fellow, "Now how about a watch? So long as you've got the time, you'll never have to ask a policeman. Here's the very one, a magnificent, fifty-jeweled, ten-day chronometer, rectified for Mars, checked by the Deimos Observatory, and guaranteed by Mitchell & Sugden."

He tried to put it all into signs, sweating as he did it. The Martian sniffed, rejected the timepiece, chose five cheap alarm clocks. Moreover, he went right through the stock of several dozens in order to pick himself five with differing notes. Then he selected a gold bangle set with turquoises, a midget radio, an aluminum coffee percolator and a small silver pepper pot into which he solemnly emptied the inevitable packet of Martian snuff.

"That leaves you two bucks seventy," said Mitchell. The old fellow took his balance in cigarettes and canned coffee, toddled back to pay his respects to the camels. There was still a gang busy soul-mingling with the animals. "Damn the stinkers!" Mitchell heaved a huge bag of seeds onto the scales. The needle swung around. "Seven hundred



smackers," he breathed. He scrawled the amount in big figures with a blue pencil, held it out to the new customer.

THIS ONE was a young Martian, taller than the average. He nodded, produced a five-year-old catalogue, opened it, pointed to illustrations, conveyed by many signs that he wanted the cash put to his credit

until he had enough to get an automobile.

"No use," said Mitchell. "No gasoline. No go. No soap!" He made snakes of his arms in his efforts to explain the miserable and absolute impotence of an automobile sans juice. The Martian watched gravely, started to argue with many further references to the catalogue. Mitchell called in Sugden to help.



*The Martian started his machine, and abruptly there was intelligible speech where only telepathy had been—*



After ten minutes, Sugden said: "I get it. He wants a heap with a producer-gas plant. He thinks he can run it on local deadwood."

"For Pete's sake!" groaned Mitchell. "Now they're going Broadway on us! How in the name of the seven devils can we get one here?"

"In pieces," Sugden suggested. "We'll try, anyway. Why not? It may start a cult. We might end up with a million jujubes apiece. We might both be Martian producer-gas automobile tycoons, and be ambushed by blondes like they say in magazines. It'll cost this guy an unholy sum, but it's his sum. Attend to the customer, Jimson, and see that he's satisfied."

With doubtful gloom, Mitchell made out a credit slip for seven hundred, handed it across. Then he took a deep breath, looked around, noticed camels and Martians regarding each other with the same philosophical interest. Some of the animals were munching choice titbits offered them by the natives.

More bags, more weighings, more arguments all through the rest of the day. As usual, the clients didn't want a good proportion of the Mitchell-Sugden stock and again as usual, some of them wanted things not in stock and difficult to obtain.

On the previous trip one Martian had taken a hundred phonograph records and had ordered some minor electrical apparatus. Now he turned up, claiming his apparatus, didn't want another disk, put in an urgent order for a couple of radio transmitter tubes of special design. After half an hour's semaphoring, he had to draw the tubes before Mitchell understood what was wanted. There was no law against supplying such stuff, so he booked the order.

"Oh, Jiminy," he said, wearily,

"why can't you guys talk like civilized people?"

The Martian was faintly surprised by this comment. He considered it solemnly, his big, grave eyes wandering from the liverish Mitchell to the camels and back again. The dromedary nodded, smirked, and let the juice of an overripe *wushkin* drool from its bottom lip. The Martian signed Mitchell an invitation to follow him.

It was on the verge of dusk and time for ceasing operations, anyway. Leaving his exhausted partner to close the post, Mitchell trailed the Martian. Fifteen years before he had trailed one to an illegal still and had crawled back gloriously blotto. It might happen again.

They passed the camels now being groomed by the officious Ali Fa'oum, wandered through the town to a large igloo halfway between the market place and the northern outskirts. A mile to the south the gongs of Communal Hall were sounding a raucous evensong. The big tremblor caused dithers in the digestive system.

Inside the igloo was a room filled with a jumble of apparatus, some incomplete, some discarded but not thrown out. The sight did not surprise Mitchell, since it was well known that the Martians had scientific abilities along their own peculiar lines. His only emotion was a feeling of disappointment. No still.

CONNECTING UP a thing looking like a homemade radio receiver with a tiny loud-speaker, the Martian drew from its innards a length of thin cable terminating in a small, silvery object which he promptly swallowed. With the cable hanging out of his mouth, his big eyes staring solemnly at Mitchell, he fiddled



with dials. Suddenly, an inhuman, metallic voice oozed from the loud-speaker.

"Spich! This artificial spich! Just made him. Very hard—cannot do much!"

"Ah!" said Mitchell, faintly impressed.

"So you get me tubes. Do better then—see?"

"Sure," agreed Mitchell. Then the overwhelming thought struck him that he was the first Terrestrial to hold vocal conversation with a Martian. Front-page news! He was no pressman, but he was trader enough to feel that there ought to be a thousand frogskins in this interview if he handled it right. What would a journalist do? Oh, yes, ask questions. "Why can't you guys speak properly?" he asked, with unjournalistic awkwardness.

"Properly?" squawked the loud-speaker. The Martian was astonished. "We do talk properly. Ten thousand years ago we ceased this noise-talk of low-life forms and talked here"—he touched his forehead—"so!"

"You mean you converse telepathically?"

"Of course—same as camels."

"What?" yelled Mitchell.

"Sure! They are high form of life."

"Like hell they are," bawled Mitchell, his face purpling.

"Hah!" The Martian was amused. "I prove it. They talk here." Again he touched his forehead. "And not here, like you." He touched his throat. "They toil in moderation, eat reasonably, rest adequately, wear no clothes, pay no taxes, suffer no ills, have no worries, enjoy much contemplation and are happy."

"But they darned well work,"

shouted Mitchell. He smacked his chest. "And for me."

"As all must, high and low alike. You also work for them. Who works the hardest? You see—*glug-glug!*" The loud-speaker gulped into silence. Hurriedly, the Martian made adjustments to the set and presently the speaker came to fresh but weaker life. "Battery nearly gone. So sorry!"

"Camels, a high form of life!" jeered Mitchell. "Ha-ha! I'll believe it when I've got a lemon-colored beard nine feet long."

"Does the delectable pinna know the superiority of our bellies? How can *you* measure the mental stature of a camel where there is no common basis? You cannot talk inside the head; you have never known at any time what a camel is thinking." The loud-speaker's fading crackle coincided with the Martian's patronizing chuckle. Mitchell disliked both noises.

"So long as it knows what I'm thinking, that's all that matters."

"Which is entirely your own point of view." Again the Martian registered his amusement. "There are others, you know, but all the same—*crackle, crackle, pop!*" The apparatus finally gave up the ghost and none of its operator's adjustments could bring it back to life. He took out the artificial larynx through which he had been talking, signed that the interview was over.

MITCHELL RETURNED to the camp in decidedly unsweet humor. Sugden met him, and said, "We shifted sixty percent. That means another hike starting tomorrow morning. A long one, too."

"Aaargh!" said Mitchell. He began to load the thermics. Sugden gave him a look, holed down in his



sleeping bag and left him to work it off.

Jenkinsville was buried in slumber and Sugden was snoring loudly by the time he finished. He kept muttering to himself, "Homo saps, huh? Don't make me laugh!" all the while he worked. Then he got the last thermic sealed up, killed a spider he found scuttling around in an empty can, had a last look over the camp.

The camels were a row of blanketed, gurgling shapes in the general darkness, with the nursemaidish Ali Fa'oum a lesser shape somewhere near them.

Looking at them, Mitchell declaimed, "If I thought for one moment that you misshapen gobs of stink-meat knew what I was saying, I'd tell you something that'd take the supercilious expression off your faces for all time!"

With that blood-pressure reliever, he started back to his own sleeping bag, got nearly there, suddenly turned and raced toward the camels. His kick brought Ali into immediate wakefulness, and his bellow could be heard all over the camp.

"Which one of them made that noise?"

"No can tell," protested Ali, sleepily. "Forty-four of them an' dromedary. How tell who makes noise? Only Allah know!"

Sugden's voice came through the night, saying, "Mitch, for Heaven's sake!"

"Oh, all right." Mitchell returned, found his torch. "Telepathic bunk!" he muttered. "We'll see!" By the light of his torch he cut a playing card into forty-five pieces, numbered them with a pencil, shuffled them in the dark, shut his eyes and picked one. *Number twelve.*

Waking again, Sugden stuck his

head out and said, suspiciously, "What're you doing now?"

"Crocheting for my bottom drawer," said Mitchell. Ignoring the other, he examined his gun by the light of the torch, found it fully loaded with ten powerful dynoshells. Smiling happily, he murmured, "Number twelve!" and lay down to sleep.

Ali shook him into wakefulness with the first flush of dawn. Sugden was already up, fully dressed and looking serious.

"One of the camels has scrambled," he announced. "Number twelve."

"Eh!" Mitchell shot up like a jack-in-the-box.

Sugden said, "And I don't like that funny look you put on when I told you. It was my camel, not one of yours. Have you pinned an abracadabra on it?"

"Me? What, me?" Mitchell tried to look innocent. "Oh, no!"

"Because if you have, you'd better unhex it mighty quick."

"Oh, we'll find it," comforted Mitchell. He got dressed, stowed away his gun, made the mental reservation that he'd do nothing about number twelve, nothing at all. He made the thought as powerful as he could.

The missing animal was waiting for them beside the trail one hour out from Jenkinsville. It took its position in the string as of old habit. Nobody said anything. It was a long time since Mitchell had been so quiet.

After a while, Sugden's dromedary turned its neck and made a horrible face at Mitchell riding right behind. He still said nothing. Deliberately, the caravan swayed on.



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# INSIDE OUT MATTER

by R. S. Richardson

*A discussion of one of the most intriguing discoveries of recent years; not only is inverse, or contraterrene matter a theoretical possibility—it exists and we're constantly bombarded with bits of it!*

Most factual material requires some elaboration to make it palatable, a little flossing up to arouse the reader's interest.

But occasionally one comes across material so strange, so utterly incredible, that no method of presentation could possibly be more effective than a bare statement of the facts themselves. This is the case with the newest concept of science: "contraterrene" or inside out matter.

Contraterrene means just that—a type of matter exactly the opposite of ordinary or terrene matter. Instead of atoms composed of a positive nucleus surrounded by electrons, it consists of a *negative nucleus* surrounded by *positrons*. In other words the roles played by the charged particles are interchanged. So far as external appearances go, it would look just like ordinary stuff. Even the supreme analyzer of science, the spectroscope, could not distinguish between the two.

The idea that such strange material might exist in space did not originate with some crank or obscure professor. On the contrary, it has behind it three of the biggest names in atomic physics: W. Heisenberg, E. Schrodinger, and P. A. M. Dirac,\*

\*"Die Moderne Atomtheorie," p. 45, Leipzig: Hirzel.

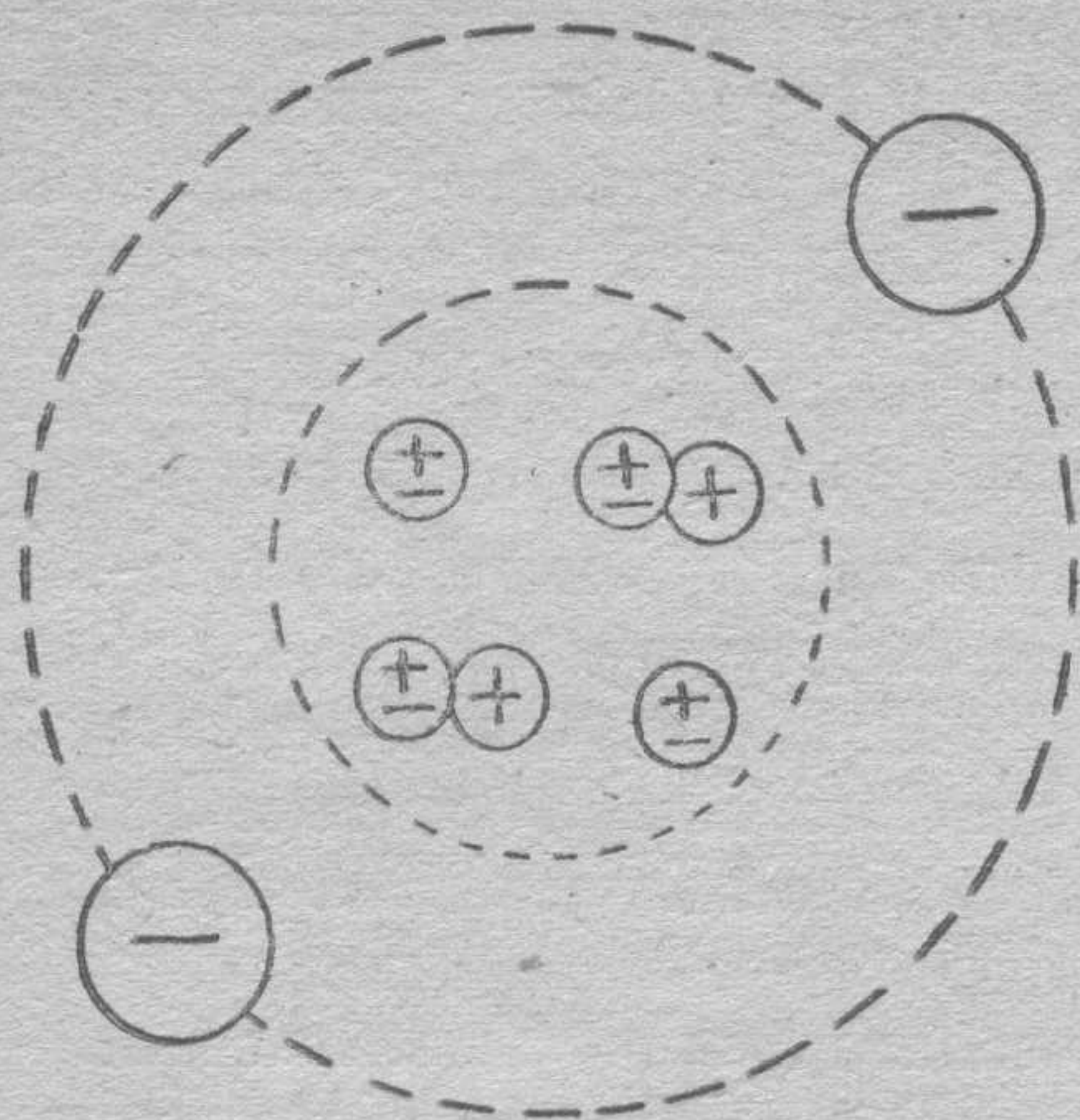
all of whom are Nobel prize winners. Guided by certain symmetry relations in the quantum theory of the electron, they were led to this startling conclusion, as astounding as anything a science-fictionist ever dreamed of.

But the most remarkable feature that has emerged from the investigation is that a fundamental terrene particle and a corresponding contraterrene particle would *destroy each other upon collision*, in the same way electrons and positrons are known to do. The two substances would be annihilated with the release of an enormous amount of energy.

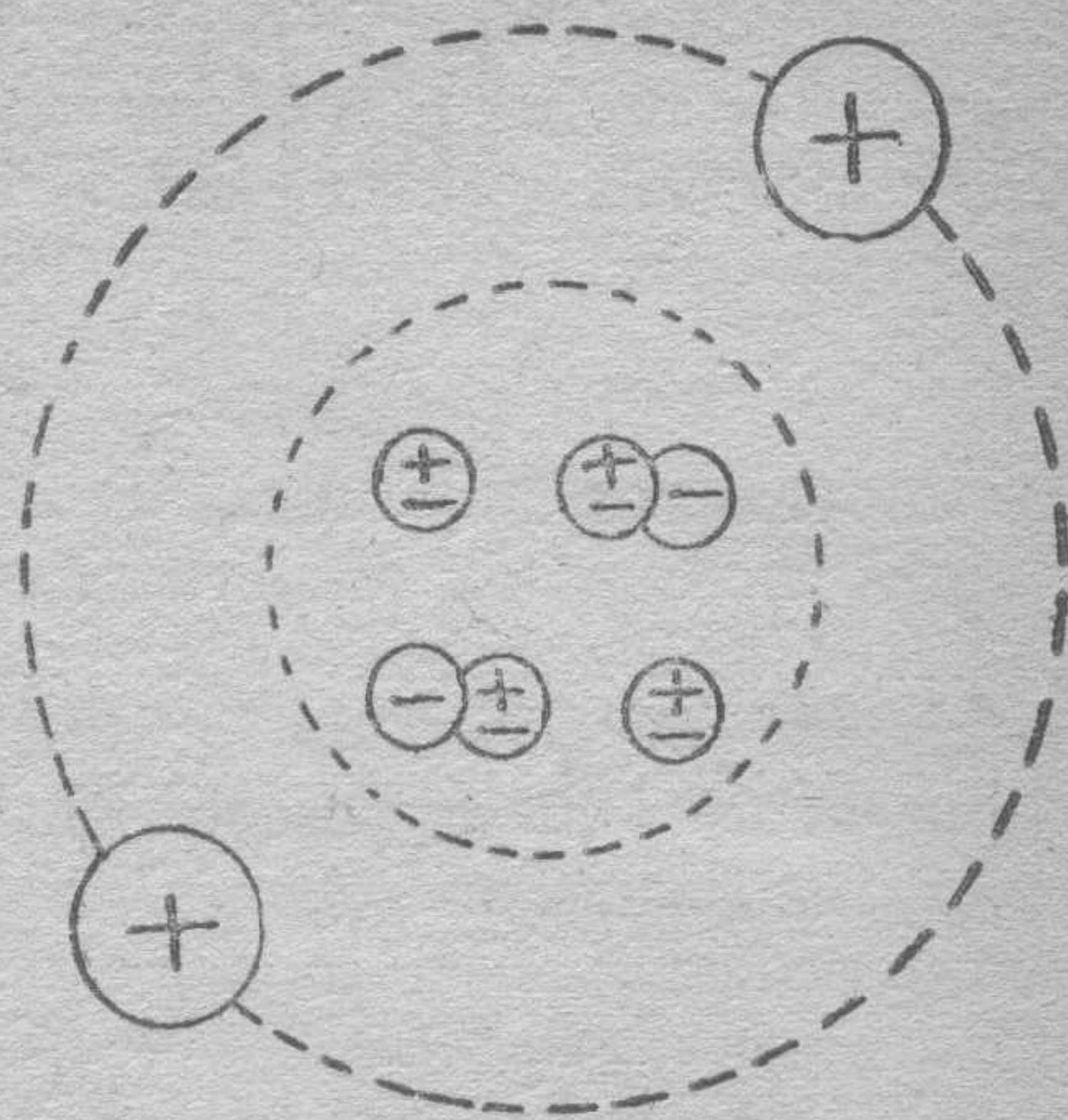
This suggests at once a possible means of detecting contraterrene matter if it exists in our part of the universe. Suppose a large contraterrene meteorite were seen to strike the Earth. There would be a terrific explosion, a huge crater would be formed, and the meteorite would completely disappear. Not a trace would remain. Centuries later the crater would still be there, an unmistakable example of meteoric impact, yet scientists would be compelled to reject the evidence owing to the inexplicable absence of meteoric fragments.

Now it has recently been pointed out that formations of precisely this





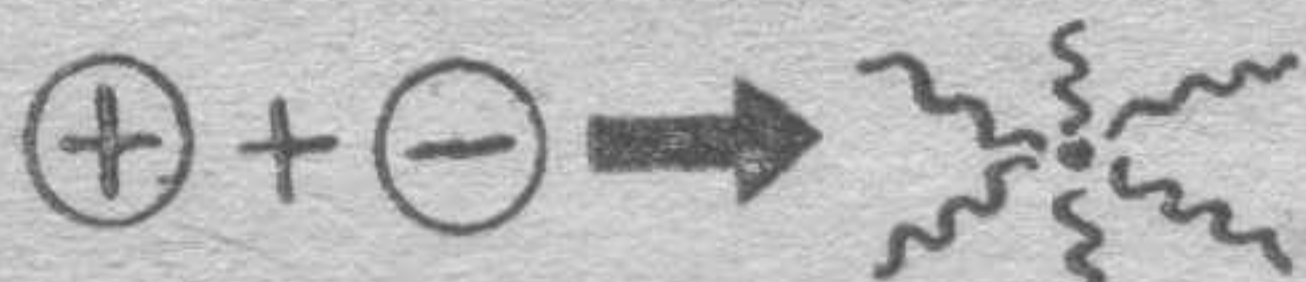
TERRENE ATOM  
(HELIUM)



CONTRA TERRENE ATOM  
(HELIUM)

WHERE  $\oplus$  MEANS NEUTRON,  $\oplus$  MEANS POSITRON,  $\ominus$  MEANS ELECTRON,  $\oplus\oplus$  MEANS PROTON AND  $\oplus\ominus$  IS A NEGATRON, OR NEGATIVE PROTON.

INDIVIDUAL PARTICLES REACT:

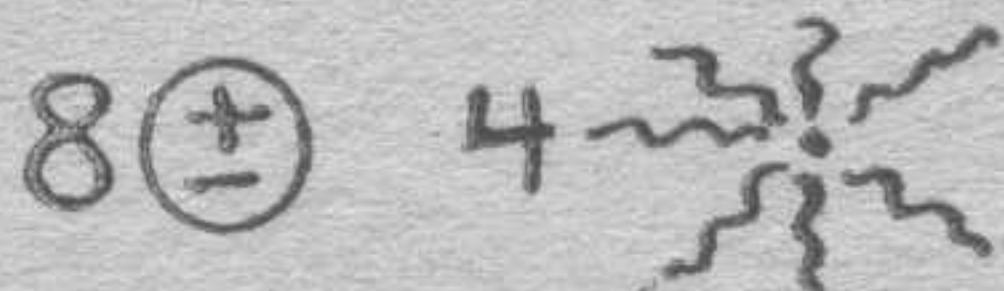


BOTH PARTICLES ANIHILATED TO PRODUCE A BURST OF GAMMA RAYS



$\oplus$  — UNAFFECTED

FINAL PRODUCT OF REACTION:



kind have long been known. Of half a dozen examples scattered over the globe probably the best known are the funnels in Siberia and the Carolina Bays in the United States. In both cases, despite the obvious evidence of impact origin, geologists and

mineralogists have reluctantly abandoned this solution because no meteors could be found in the vicinity. L. Kulik, who investigated the Siberian disaster of 1908, was personally convinced the peculiar funnels were made by meteorites,



and attempted to explain the anomaly by the unlikely hypothesis that the meteorites were completely vaporized or flew off into space again (?).

ANOTHER equally puzzling situation is the deposits of silica glass in the Lybian Desert. These are easily explained by fusion under the intense heat of meteoric collision, except that long and careful search has repeatedly failed to disclose any meteors.

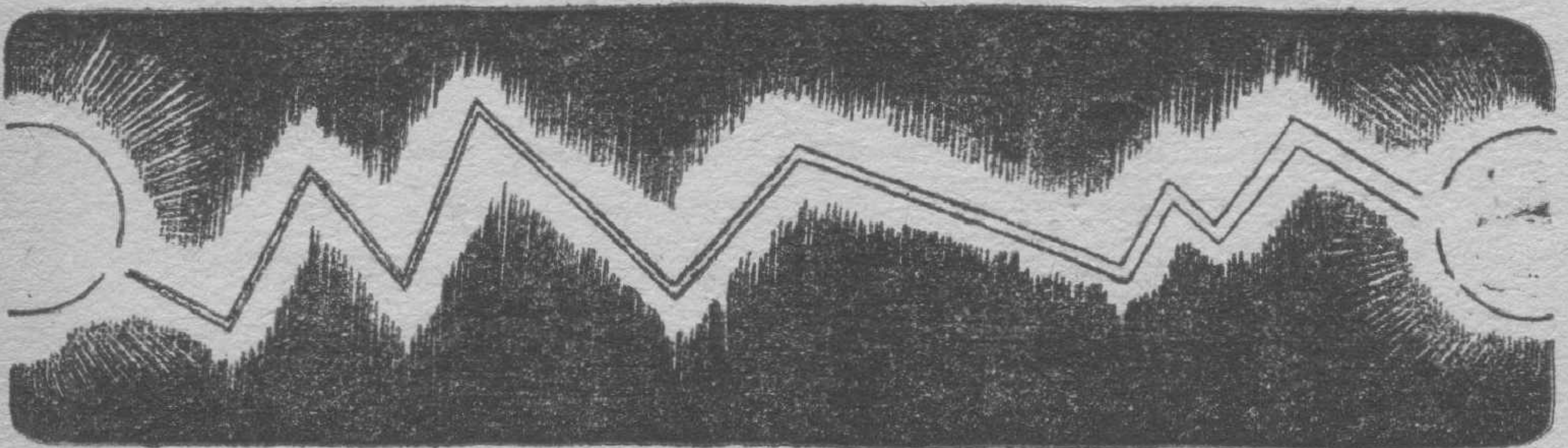
All these difficulties vanish if we assume the existence of contraterrene meteorites. Calculations show that a comparatively small contraterrene iron meteorite would be able to survive passage through the Earth's atmosphere and reach the surface, after which it would cease to exist as matter. In a flash its mass would be converted into radiant energy, leaving unmistakable evidence of a terrific collision—except for the mysterious absence of the colliding body.

It has been suggested that comets may be contraterrene objects. Com-

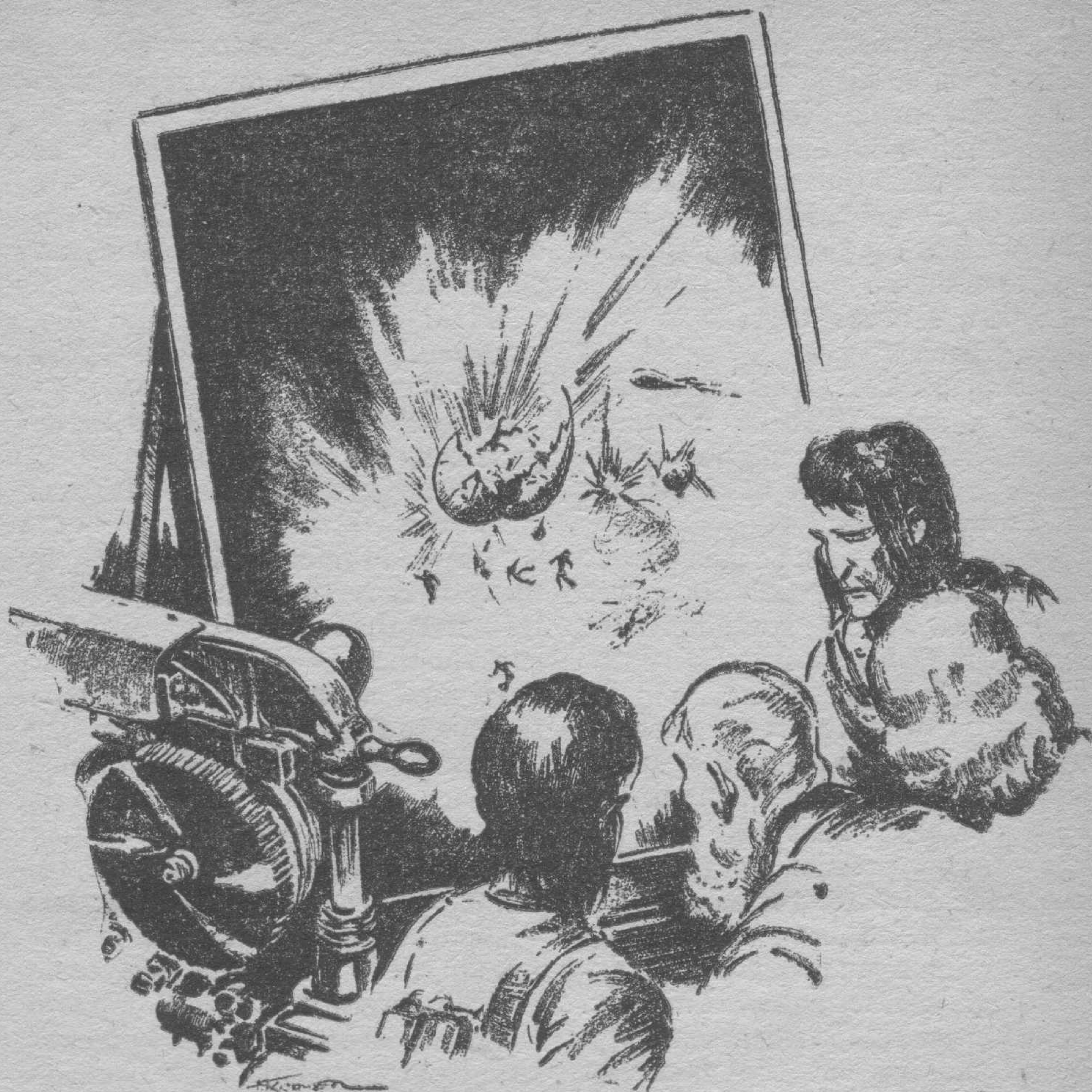
ets have always been regarded as strange things totally unrelated to our Solar System, and their orbits indicate many of them came to us from outer space. Consider what would happen to a solid contraterrene mass that has strayed into our System and finds itself surrounded by matter incompatible to its existence. The body would be subject to bombardment by terrene particles and strain from tidal action and heating by the sun. These will act to produce annihilation, transmutation and mechanical disintegration. As the mass is gradually worn away, it also undergoes a shift in chemical composition as the original material changes to lighter elements by transmutation. Gases would be continually released, producing a halo and other cometary features.

Looking into the future, the possible existence of contraterrene matter would seem to add still another hazard to the exploration of space. Before landing a rocketship on a strange planet, perhaps it would be a good idea to drop something overboard to see if it explodes on landing.

THE END.







## DEFENSE LINE

by Vic Phillips

*The hillbillies of the asteroids! Outcasts of the System, hated by the men who ran the ships of space—yet they held the answer to the problem that had to be solved!*

Illustrated by Kramer

"WHAT'S biting you this time, chief?" Strike Morgan asked conversationally.

Martin Abbot winced as he turned away from the window. He would

have liked to strangle his lanky, disrespectful subordinate. But he knew perfectly well that it was only Strike's uncanny genius for digging out news and making two-column



stories grow where there had formerly been nothing but an inkless waste that made North American *News* stand out from all the other agencies in the business. Martin Abbot paced his stout, vigorous body to his desk and sat down opposite his ace news hound.

"Strike, I want to talk to you about colonies."

"Go ahead, talk. This is allegedly a free country," Strike muttered without altering the angular droop that was his method of sitting on and around a chair.

Abbot let that ride; at the moment he was prepared to let Strike get away with almost anything. He came at it again, carefully.

"What I want, Strike, is your opinion as to what chance we have of establishing the colonies of Earth people on Callisto and Gannymede."

Strike stared at his boss with the unwinking, expressionless gaze of a dead codfish. "Are you kiddin'?"

"I am not," Abbot snapped.

"Why don't you read your own advertising?" Strike suggested bitterly. "You're running the Allenstine Corp. spread making out the moons of Jupiter have been turned into a pair of little green paradises. What do you expect me to say?"

"I'm still running our advertising department," Abbot bit the words out. "All I want from you is your knowledge of the Outer Planets and what chance these colonies that the corporation is establishing will have."

"That's easy, they haven't got any at all."

"How do you get that way?"

"Just take a look at me," Strike invited softly. "I don't sit this way because I like it. I've had gravity differential neuritis so long my joints creak if I just think of moving. Leave me alone for ten minutes

and I'll start talking to myself, and I get back to Earth pretty regularly. I don't get the loneliness."

"It'd be different with a lot of people."

Strike shook his head. "Plant 'em out there and a couple of thousand people will get just as lonely as one."

"Make it two hundred and fifty thousand," Abbot suggested. "And mostly men."

"What?" Strike was so startled he practically sat up. "You mean—"

"A quarter of a million. It's got me worried, Strike."

"I should think you would be worried. If those guys go out to Jupiter's moons, you're practically the guy who shanghaied them. You must have used about all the lead pipe there is to round up that many."

Abbot shook his head. "Nope, nothing like that. This is all it took." He unrolled a legal-looking document closely set with fine type. "You can read it if you like, but what it amounts to is an agreement to take the signer out to Gannymede or Callisto, grubstake and equip him till he makes a strike, gives him clear title to any property he stakes and guarantees to haul his ore to Earth for fifteen percent of the market price of the cargo. You'd sign one like that yourself."

"Yeah . . . yeah . . . sure, come on, what's the catch? Where's the hidden clause? You'll probably find something in there behind a few whereases that makes out the guy's signed away a couple of little trifles, like his immortal soul and his right arm."

"I've strained this thing through five of the best lawyers in the business, and it comes out clean every time. Believe it or not, Strike, it looks as if the Allenstine outfit has reformed and is trying to 'push the frontiers of humanity ever onward.'"



"Whoever writes your corny copy doesn't know what he's talking about. There's only one breed of human that's physically equipped to live on the Outer Planets and they're—"

"They're what?"

"Skip it. I was talking out of turn."

Abbot treated his subordinate to a long, speculative look. "Yeah, and we'll take that up later. But as I say this agreement is apparently all right. However, there are some circumstances surrounding the business that could stand a little investigation."

"I am astonished." Strike's tone was utterly bored.

"Is there anything to battle on Jupiter's moons?"

"Just the climate. If you want to breathe the local atmosphere out there, you mix it up as liquids, then thaw it out. Nice place; you can really enjoy it once you've been frozen to death."

"Hm-m-m. Well, maybe you passed up something belligerent because these colonies are going out well armed, or with the means of getting that way. All the mining equipment that has been shipped is the stuff that can be converted into armament. There's been enough atomic projectors and replacement parts sent out to burn the moons into asteroids and more explosives than could ever be used in mining. I've seen the manifests."

"Nuts. You're seeing bogies."

"Don't worry, you will, too. There's more to this. I'm remembering what happened to the first attempts to colonize the Outer Planets. The Bevan family tried it in the Asteroid Belt and in a few generations the whole crew were crazy and had to be hunted down before they became a menace to the

entire System, and the first colonies on Jupiter's moons went the same way. Now make it a quarter of a million well-armed men out where they can go killing crazy. Get it?"

"I'm away ahead of you, but tell me more."

"THERE'S this. About three-quarters of the Inner Planets Defense Fleet is missing." He smiled with grim complacency at Strike's sudden attentiveness. "Maybe more," he added. "And what is left of the force is being stretched to cover up the missing ships. Something's going on Outside, Strike. I've every reason to believe it's liable to be bad for us here. Exactly what it is I don't know, but it's not colonizing, the corporation doesn't have to give away mineral rights to do that, and they don't have to arm the colonists as if they were expecting to repel an invasion."

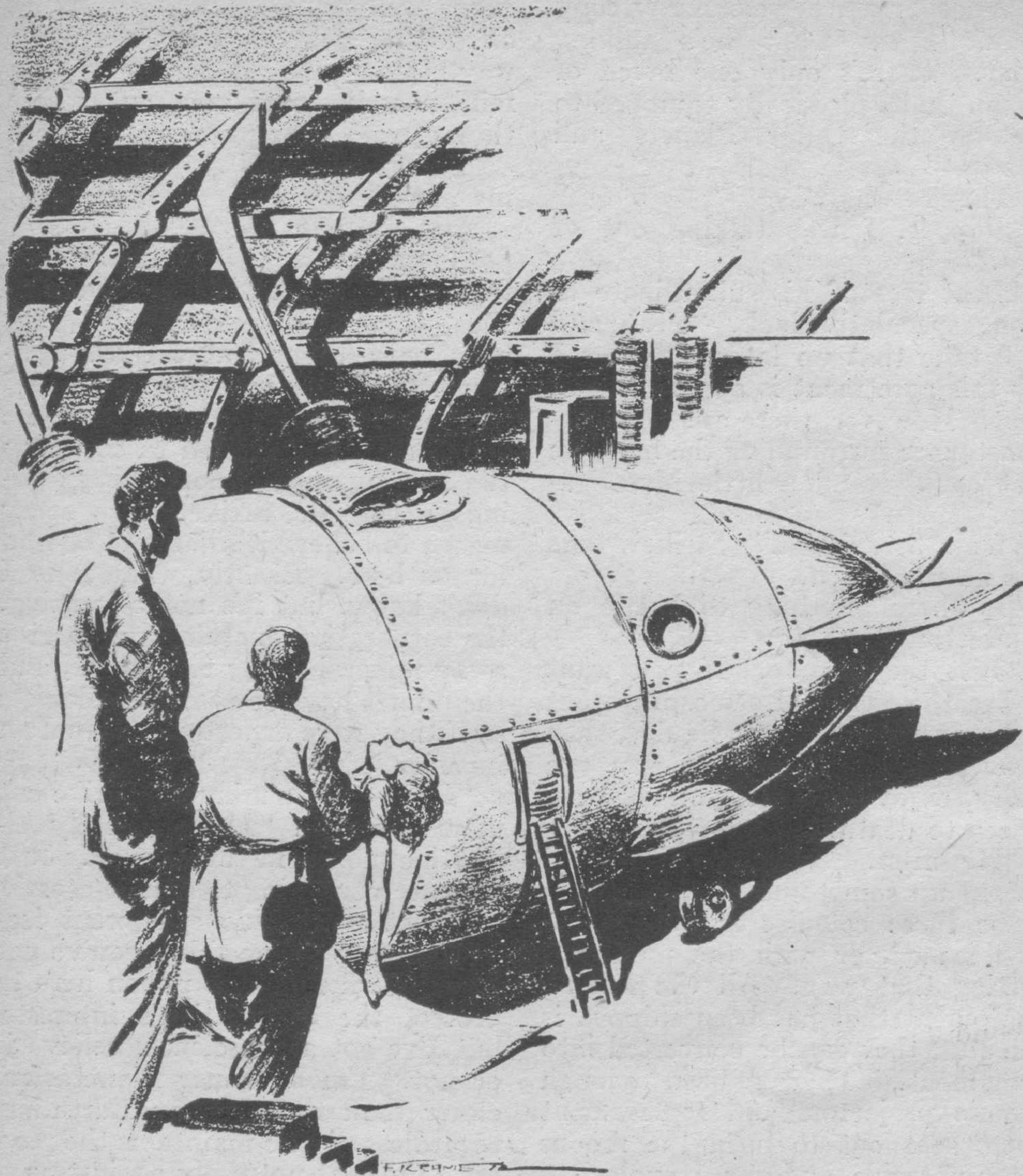
"Hey—wait a minute," Strike cut in suspiciously. "There's mostly Alenstine money in this agency. Just who are you fixing to double-cross?"

Abbot's pale-blue eyes went ice-cold. "This is one thing you've got to get, Strike. I was put in here to protect the corporation's interests, but I've got a conscience, believe it or not. I'm an Inner Planetarian, closer than that I'm an Earthling, regardless of who maintains the payoff. I'm just naturally against anything that'll make this planet uncomfortable, because it would touch me. Savvy?"

Strike was silent for a long moment. "O. K., just so we get it straight," he said softly. "If you aren't sure what's going on Outside, why don't you send someone out to give these colonies a once-over?"

"I have. I sent Terlake out and as soon as he got outside the Asteroid Belt he became a model of punctual





*"Sick or not—she's got to go because she's the only one who can crack that code—"*

regularity, all the life went out of his stuff. I thought maybe it had gone out of him, too, so I sent Craith with orders to send Terlake back and take over the assignment. Now I'm getting those damned regular reports from both of them. It should be from one or the other, but not both, and, according to them, everything is beautiful."

Strike opened his mouth to say something and closed it again.

Abbot nodded grimly. "Yeah, it begins to look that way, doesn't it?" he agreed. "The Allenstine Corp. controls the only two practicable passes through the Asteroid Belt, and they're keeping whatever goes on Outside to themselves. Maybe it's all right. Maybe the Earth isn't



in danger of anything, but I'd feel a lot better if I knew. That's where you come in. Two years ago, when you made your last trip in from Gannymede you cracked up in the Asteroid Belt, got a major repair job done on your ship and came on through to Earth. Your story that you didn't see anyone and did the minor repairs yourself just isn't good enough. I think you know another way through the Belt other than the two passes the corporation is watching. I want to know where that pass is. We've got to get Outside and get information."

Strike's face became as expressionless as a carved wooden post. "What makes you think a major repair job was done on my ship that time?" he asked warily.

Abbot flipped his powerful, stub-fingered hands up and dropped them on the desk resignedly.

"It's all right by me, Strike, if you want this the hard way." Strike didn't respond and Abbot continued. "Most of our metallurgists said it was impossible for your ship to have been straightened out and welded together again as perfectly as it would have to have been to get it in flying condition after the crash your instruments registered. They figured your instruments were wrong. But Sean Lambert told me that whether or not it was possible to do the job, it had been done, and so perfectly that there practically weren't any tool marks to show that repairs had been made. But there were some. Sean bought your ship and he's tracking down those tool marks. It won't take him long to identify the tools and find out where they came from. Now—are you going to talk? You don't need to worry if the crew that helped you is some freighter outfit that found a way through and is slipping out to do a little free-lanc-

ing. We only want to put one ship out, then we'll forget about it."

Strike smiled thinly. "Sean Lambert won't trace those tools, unless he can dig up manufacturer's records about three hundred years back."

"Three hundred years? What d'you mean?"

Strike inspected his fingernails critically. "If you'll recall, that's about when the degenerate Bevans were supposed to have been wiped out in the Asteroid Belt."

"So what? What's that got to do—"

"Oh, nothing—they're just the boys who fixed up my ship." There was a long silence.

"This is no time to be funny, Strike," Abbot suggested tentatively.

"Do you want to hear about this, or don't you?"

"Go ahead."

STRIKE lined his thoughts up for a moment.

"It starts with old Hugh Bevan. Founded the Lunar Mining outfit, made the Bevans pretty big stuff, but when the Allenstines took over Venus Consolidated and Mercury Corp. he sold out to them and bought a monopoly on the planets outside the orbit of Mars from the government. For about thirty years everybody thought he was crazy; the old liquid-fuel rockets never did get outside Mars. That was when the Moon, Venus and Mercury were booming and the Allenstines had corralled it all.

"Then Van Dorne and Coddington brought out the atomic drive and threw in with the Bevans. Their monopoly on the Outer Planets wasn't funny any more. They started mining the Asteroid Belt and got as far as the moons of Jupiter. They didn't let anyone but the Bevan clan in on it, and they colonized as they



went. Even in the early days there were lots of the clan didn't get to see Earth at all. That was old Hugh's idea. They were a strong-minded bunch, those Bevans. He was determined to raise a tribe that would be able to survive life on the Outer Planets and, being the only ones that could, would control a bigger empire than all the rest of the System put together.

"That old guy dreamed big while he was at it. They hauled in billions of dollars' worth of ore and with old Hugh and his descendants running things, every cent of it went into equipping their bases and building up their fleet. The dream of controlling the Outer Planets was branded on every Bevan youngster as soon as it could understand anything. And they damn near made it—"

"Now look here, Strike—you don't expect me to— O. K., O. K., go ahead." Abbot's voice tapered off.

"Mining was easy in the Asteroid Belt, no big gravities to contend with. Hauling the ore in with the help of the Sun's gravity kept shipping costs low, and it wasn't long before the Allenstine Corp. was just about broke. But they had the inside track with the government on the home front. That was one thing old Hugh had forgotten.

"They got a supreme court verdict that the Bevans' monopoly was unconstitutional. Then they tried a little highjacking, but the Bevans cleaned up on them. It wasn't hard for the Allenstines to call that piracy and make it stick. The Defense Fleet was sent out and there was your first interplanetary war. The Fleet wasn't cleaning up degenerate colonists; they were hunting Bevans for the benefit of the corporation. Men don't go killing crazy on the Out-

side, they just get lonely and kill themselves."

"Strike—you're crazy! It wouldn't have taken the Defense Fleet to clean up a few colonists," Abbot protested. "Man, they'd just have been arrested, or something—"

"You don't know these Bevans," Strike cut in grimly. "It took four years and most of the Defense Fleet to get them off the moons of Jupiter and they never were chased out of the Asteroid Belt. They're still there and they have been for the past three hundred years. It's them that happen to any ships that crack up in the Belt. The war's still on as far as they're concerned, and it's against all the Inner Planets."

"Strike, you're wrong—that can't be. Man, if there were people on the asteroids, we couldn't help knowing."

"Yeah? With the Allenstines controlling all the communication lines from the Outside? Look, boss, darn few of the Allenstines themselves know that the Bevans exist. They teach you in school here that the asteroids are uninhabitable and that their orbits are so erratic there are only two safe passes through the Belt. If you don't think they've carried their obliteration campaign all the way, just try to find any records of the Bevans on Earth, or any of the old charts of the asteroids. They're what amounts to a lost race of astral hillbillies out in the Belt. I know; I've been there."

"They fixed your ship up?" Abbot asked uncertainly.

Strike nodded. "Practically rebuilt it with less equipment than I had in my emergency repair kit. They're the finest metal workers in existence. They've got to be. The Asteroid Belt is pretty lean picking. After I recovered from the crash, it took me three weeks to convince them that



most of the people of the Inner Planets didn't particularly hate all Bevans. They didn't even know there were such people. Then they fixed up my ship and I came back to Earth and started to hunt up confirmation of the Bevans' story. I couldn't find much, but it was enough to make me keep my mouth shut."

MARTIN ABBOT looked thoughtful for a few moments.

"I wonder if this concentration of the Defense Fleet outside the Asteroid Belt could be the Allenstines getting ready for a final attack on the Bevans—providing what you say is true," he added hastily.

Strike shook his head. "I doubt it. The Bevans, all filled up full of hate for anything traveling out from the Inner Planets, are the best insurance the Allenstines could have against free lancers breaking into their territory."

"Then what the devil would they be doing?" Abbot demanded generally. "They don't need to attack the Inner Planets. They pretty well control things here as it is—I know. Uh . . . I suppose there are more than two passes out through the Belt?"

"Thousands of 'em," Strike grunted.

"Think the Bevans would let you use one?"

"What'd that get us? I couldn't land at any of the bases Outside. If they stopped Craith and Terlake, they'd stop me and a mining outpost on Callisto hasn't got quite the same volume of traffic as Mars Port on Earth. I doubt if I could slip in and out without being noticed."

"No, you couldn't do that, but you could go Outside and listen," Abbot said softly.

"Yeah, and with everything com-

ing in over the corporation's lines in code a lot of good that would do."

Abbot settled back with a smug expression of satisfaction. "Suppose I send somebody with you who can decode for you?"

Strike stared at Abbot levelly, then shook his head. "Nope. Anyone who can decode has been, or is, on the inside with the Allenstines and nobody of that breed is going with me to interview the Bevans."

"Well, you don't need to worry about this one," Abbot said easily. "She's an amateur. Her name's Leni Mai. I found her working in the State library. She's made a hobby of breaking codes and I've seen her work out on a sample of the corporation's latest variation. She's a genius—got a memory like a filing cabinet."

Strike blinked. "I hope you're telling the truth."

"When do you want to start?" Abbot countered.

"Wait a minute—wait a minute. What kind of a female is this decoding genius? Has she had any experience with free flight? Have you had her practicing eating?"

Abbot nodded and answered the last question. "Yep, in the degravity chamber. She practically starved herself to learn. What's left of her is waiting to interview you now, but before you meet her I want to warn you to be careful. She's young and she's highly romantic. When she goes at something she dives into it whole hog, she doesn't pull any punches. I've got her going on the supersecret service angle of this business.

"She thinks we're doing her a tremendous favor letting her go along. She doesn't know she's the mainstay of the whole business, and you don't need to tell her. I think you could sell her good and solid on the Bevans



being downtrodden and badly double-crossed underdogs."

"Sure, I can do that, all right, but do I get a look at her or are you going to sit around here talking all day?"

Abbot stifled whatever it was he'd been going to say, reached over and flipped the microphone switch on his desk.

"You can come in now, Leni," he said.



*The reporter groaned. She didn't have the least idea of how to handle herself with no weight.*



STRIKE'S first impression was that she was tall, for a girl, and slim. At least she would have been slim if she had had any meat on her worth mentioning, but in her present emaciated condition she was just plain lanky.

"A rag, a bone and a hank or hair." The phrase leaped immediately to Strike's mind, but the rag was in this case the blue-and-silver skirt and tunic of the library attendant's uniform; the bones made an unusually graceful skeleton, the hank of hair was a cascade of translucent silver. That mass of shoulder-length hair told Strike a lot. This girl was a female and that was unusual enough to make her a novelty in a world where most women had renounced their sex.

"Sit down, Leni," Abbot invited.

Leni sat with her hands folded in her lap, waiting. She had the quiet, reserve strength of the genuine female that was so noticeably lacking in the modern neuters. This girl would dedicate herself to high purposes, even if she didn't quite understand them.

"You figure you can break the corporation's code?" Strike asked carefully.

"Yes," Leni told him simply.

Strike glanced at his chief. Abbot smiled with smug complacency.

"Uh . . . you can eat without a gravity?"

"Oh, yes," the girl said quickly.

Strike shrugged. "It's your stomach. All we need is for you to get us a ship ready," he said, turning to Abbot.

"It's ready—just one of the lines I keep open. In this business it's always a good idea to have several ways of running out at a moment's notice."

"I see, just one big happy family, with their hands on each other's throats."

"Yeah," Abbot agreed dryly. "Your kit's on board."

"There's just one thing I'd like to know," Strike said. "How are you going to get a ship off without anyone knowing about it?"

"Suppose you leave that to me," Abbot suggested.

Strike's suspicions suddenly crystallized as they left the office. This was bigger than just Abbot's curiosity. It would take more than that to get a ship of any great size off the Earth in secret. There had to be some sort of organization behind it. Maybe the thieves were falling out, maybe someone was getting ready to move in on the Allenstines as they had moved in on the Bevans. This listening expedition could tie in with that. If it could be conclusively proved that the corporation was doing something in the Outer Planet colonies that threatened the security of the Inner Planets, the governments of the Inner Planets could still be scared into throwing the Allenstines out in spite of their vast holdings. It was even possible that Abbot and his crew were what he had implied, Inner Planetarians who sincerely wanted to know how far their security was threatened.

Strike swallowed his questions before they were asked. The smart way to play this was ride it along and see what happened. If there was skulduggery afoot, he knew enough so it probably wasn't safe for him to try to back out.

They came out of the elevator on the roof of the building with the glorious terraced grandeur of the brilliant, nighttime metropolis below and all round them. The blue-black vault of night was star-jeweled overhead. A thin, blue-white streak of incandescent fire arched, majestically remote, across the void as an outgoing space liner left one of the



great artificial satellite freight stations that swung by, two thousand miles out, and started into its first acceleration orbit. The silence was built up on the muted, powerful voice of the great city as it lived and moved on soundless bearings. Leni got hold of a deep breath.

"It's just perfect," she sighed.

Strike grunted derisively; he knew too much about the rotten spots behind the bright facade.

"In here." Abbot ushered them into his private cruiser that lay, black and sleek, in the launching cradle.

A smooth surge of power pressed them back in their seats, then the acceleration pressure eased up and they were cruising out over the city that spread like a glowing carpet below them. Abbot checked his ship out through the fan beam of the Northeast Traffic Station, lifted it to the three-hundred-mile-an-hour level and proceeded at a decorously proper speed, calculated to attract a minimum of attention.

They flew only a few minutes, then Abbot throttled back and dropped the cruiser down into the slow-speed levels and finally swung out of the traffic lane to the minor flood-lit glory of the mansion he maintained far outside the city. Strike felt the repulsor fields catch them with a surge of reaction, the cruiser slowed powerfully to a stop, the automatic controls of the field generators nursed them down smoothly to the landing cradle. The floodlights faded out and the three of them climbed out of the ship into the starlit darkness and silence of seclusion.

An elevator dropped them down inside the building. They followed Abbot across a room, down a corridor and out into the night again.

"Now what?" Strike demanded.

"We walk," Abbot said briefly.

"It's only four miles."

"Walk four miles? Say, are you crazy?" Strike demanded aghast. In common with most Earth people he had the transportation habit built into him from birth. It was unthinkable to traverse on foot any distance that could be comfortably got over otherwise.

"Sure, I'm crazy," Abbot agreed. "Like a fox. Detectors can pick up any type of power transport, but there isn't anything yet that will detect anyone just walking."

"Well, if we gotta we gotta," Strike capitulated resignedly. "Let's get going."

THEY STARTED OUT into the night. Abbot, surprisingly sure-footed, led the way along an invisible trail through the scrub bush up the gentle slope north of his mansion. The four miles bit into most of an hour and by that time Abbot was still pushing his stomach ahead of him up the hill as vigorously as when he started. Strike was positive they were climbing the face of a vertical precipice. The four-fifths of his life that he had spent in the narrow confines of a space cruiser had done nothing to improve his powers of personal locomotion.

Leni, weak and light-headed from her self-imposed fast, swayed along, more than half supported between the two of them, and babbled happily about the night and the stars. They finally breasted the rise and emerged on the top of the long slope; the ground dropped gently away again in front. The scrub bush all round them was silvered magically by the phosphorus-white, full summer moon that lifted majestically above the eastern hills. They relaxed their hold on Leni and her knees buckled. They laid her gently on the short, springy turf. She sighed once, then



curled up around her empty stomach and went to sleep.

"Poor kid, must be just about worn out," Abbot grunted sympathetically.

"And Strong Heart is all broken up about it," Strike said bitterly derisive. His knees felt shaky, his chest hurt and he was having trouble with his breathing. Vaguely he resented Abbot's sturdy solidity.

The boss' face was suddenly as cold and bleak as a block of gray granite in the moonlight. As he stood there with his feet solidly planted and his head thrust a little forward he was an Earthling and he couldn't be anything else. He spoke slowly.

"Listen, Strike," he said, "get this once and for keeps. I'm willing to push Leni just as far as she can go in this, or you, or anyone else who'll serve the purpose. Look."

He swung his arm, taking in the whole sweep of gently sloping bush country, flooded with the fey mystery of silver light and deep moonshadow. The warm, ripening Earth scents of midsummer came to them out of the night. Strike shuddered as he recalled the freezing, murderous cold of the station on Gannymede, the spaceport on Callisto, and a thousand other far-flung outposts that he had visited. This was his home planet, the one he was designed to fit, the only place in the whole Universe where humans could relax. With a surge of emotion that was tied closely in with the basic laws of self-preservation, he realized the vital importance of this small, globular result of an astral accident swinging round a third-rate sun.

"Well, what? What am I supposed to look at?" Strike muttered, but Abbot had been watching his face and he could see what conclusions his lean, bitter subordinate had reached.

"I think this planet is threatened,



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or at least our operation of it," he said quietly.

"Well, why didn't you say so in the first place? What's the idea of the holdout? Why don't you give me all of it?" Strike demanded.

"You don't need it. You're not big enough for it," Abbot said bluntly. He didn't say it contemptuously; he simply stated a fact and Strike knew he did; there was no question of who was boss. "We've wasted enough time," Abbot continued, half to himself. "Come on, we gotta get going."

He bent and pulled on a bush. A section of turf tore loose and tilted up on edge, revealing a gaping black cavity. He picked the sleeping Leni up gently and started backward down the steep steps that led into the hole. Strike followed, the trapdoor thudded solidly down overhead, and the lights came on.

THEY WERE UNDER the hill. The roof and walls were supported by an arching tracery of steelwork and most of the space was filled with the sleek, two-hundred-foot length of Abbot's getaway ship. Strike cast an appreciative eye over the layout. The top section of the curved ceiling was hinged down its entire length and obviously designed to fold up and out in response to the heave of the launching repulsors.

He dropped his gaze to the big space cruiser. It had good lines, looked to be one of Sean Lambert's designs. A sudden thought hit Strike. Lambert was the one who investigated his ship on his return from Gannymede and his brush with the Bevans. Lambert, then, knew something was going on, perhaps knew something of the Bevans; undoubtedly he was working with Abbot.

Strike sneaked a look and found

his boss gazing at him steadily, obviously waiting for a reaction. Without a quiver he short-circuited the conclusions he had been about to reach, but he felt better. With the Lambert manufacturing and ship-building interests behind him, Sean was big stuff, with the integrity that seemed, somehow, to go with engineers. Maybe the limb they were crawling out along wasn't quite as shaky as it had appeared.

"It looks to be a nice ship," Strike conceded casually.

Abbot grunted. "You've got transmitting equipment aboard that will give you direct communication with Earth from anywhere inside the orbit of Jupiter. Come on, let's go inside."

They climbed in through the port hatch. Leni muttered sleepily as Abbot placed her in the form-fitting, sponge-rubber pads of one of the take-off supporters. The other one was for Strike and the two semivertical beds were run out nearly to the front of the control cabin on the connecting rods of the acceleration shock-absorbing pistons. Strike took in the set-up quickly: controls and their arrangement were standard, gauges all at normal. He had expected everything to be all right, but this superficial check-up was second nature to him.

Leni watched him in a sleepy daze as she half stood against the take-off supporter. She obediently downed the four ounces of Seltner solution he got from the medicine cabinet and swallowed the two Halocen tablets. She barely squirmed at the sharp prick of the hypodermic needle as Strike shot five CC's of citroline into her arm to prevent blood clotting in case of heart stoppage. For a few moments more she felt Abbot making final adjustments to the padding of the supporter, then the Halo-



cens got hold of her consciousness and took her out into blackness.

Strike shoved the charge of citroline into his own arm with the expertness of long practice and felt the smooth, viscous tastelessness of the Seltner solution slide down his throat. He picked up the two Halocen tablets and stepped back into the supporter. Abbot adjusted the padding fussily, then all at once everything was ready, there was nothing else to do. Abbot patted one of the pads unnecessarily.

"O. K., O. K. You're all through," Strike growled.

Abbot blinked and looked at him. "Yeah," he agreed absently. "Now you know what you're to do?"

"Get the Bevans to let me out through the Asteroid Belt, then tap the corporation's communication lines. If anything that sounds like it might be something comes in, wait till there's enough of it and then send it in to you."

Abbot nodded. "That's the idea," he agreed. "Well, good luck," he said abruptly.

"Listen," Strike responded. "If you've been half as smart as you think you've been, I won't need any luck."

"What I mean is, just refrain from breaking that scrawny neck of yours till you've sent in something useful," Abbot explained.

Strike grinned as the inner air-lock door closed after the boss' departing figure. He didn't swallow the Halocen tablets yet; there was plenty of time.

He wondered for a moment how Abbot had arranged for them to pass unnoticed through the continuous ring of detector fields that were set up between the twenty-four Earth freight stations, but with a mental shrug he let it go. With Sean Lambert and probably others of the same

caliber collaborating, things like that could be done.

A warning light glowed on the control panel. This was it! Whether he and Leni were aiding and abetting a tremendous felony or co-operating with high-minded patriots, they were on their way.

He drove back solidly into the embrace of the supporter in reaction to the compound upward-surgings of the repulsor fields and the atomic drive as the ship hurtled out, angling upward from the secret hangar. He moved his hand to his mouth and swallowed the Halocen tablets. Quickly he laid his arm carefully on the close-fitting supporting pads; he didn't want to develop a crippling acceleration cramp. He felt the old familiar ache creeping back into his bones as the acceleration of the ship built up, then with a smile of minor triumph he drifted away from it on the wings of soft, soothing blackness.

STRIKE'S mental equipment, long inured to the anæsthetizing effect of the Halocens, came back into control first. Automatically his eyes went to the course chart indicator; they were in the last ten degrees of their final acceleration orbit. The ring of freight stations with their detector fields were far behind. They were safely outside.

He pushed back with his elbows and shoved away from the supporter. He ached rheumatically in every joint, but he was used to that. He pulled Leni's arm out of the padding; her pulse was slow and steady, the Halocens still had her, but she was starting to recover. Strike pulled her from the padding, let her go and watched as she bounced against the ceiling and floated slowly back to the floor, fully conscious.

"We . . . we must be outside. We weren't stopped," she said with the



lift of excitement behind her voice.

"Yeah, we made it so far," Strike admitted. "We'll eat now."

A peculiarly ravenous look came into Leni's face. "Yes, I think we better," she agreed.

Strike had eaten more meals without a gravity than with one, and it didn't seem right unless he could feel the well-developed, trained muscles of his esophagus forcing the food along to his stomach. He enjoyed the sensation, but Leni merely endured it. She ate a little and watched with morbid fascination as Strike got around an incredible amount of provender. Strike noticed.

"You're not eating."

"I've had sufficient, thanks," Leni said faintly and set her jaws firmly to keep that sufficient where it belonged.

But that meal was the worst; the ones that followed in an intermittent series through the two weeks of flight were progressively easier to handle. Leni began to put on weight in the appropriate places and it wasn't long before she returned to the slim, graceful beauty she had started out with. Strike's sense of responsibility left him as she recovered and he found he could talk to her.

He found out later that he talked too much. As the ship swung out beyond the orbit of Mars, passing so close to the ancient red planet that they could distinctly see the two moons and fourteen freight stations weaving intricate patterns across the blotched red surface, he talked from the well of loneliness that had filled to overflowing during the countless thousands of hours he had spent swinging through the aching silence of space.

He told her of the Bevans. Abbot had advised it, but he would have told her, anyway. The romanticism of those wild, forgotten outlanders,

ruling a vast, widespread, secret empire, hidden behind an artificial curtain of silence drawn across their memory, had appealed to him strongly.

He told all he knew of them; he told her of old Hugh Bevan, patriarch of the clan and direct descendant of the original Hugh Bevan. He told of the few others he had seen. Storky Bevan, of the Listers—they must have been the descendants of the communications men of the Bevans originally, but now, as far as Strike had been able to make out, they carried the title simply as a family surname.

It was that way all through the loose allegiance of families scattered along the Asteroid Belt. It was a simple deduction to trace the origin of the Mantens family to the maintenance men of the early Bevans, but all memory of their original function was gone. All that was left was the remnant of a once-proud race fighting a gallant battle against degeneration, but they were losing.

They had to contend with an environment that demanded their utmost efforts for the maintenance of life. They had little or no time for study and research, the acquisition of new knowledge. That was now their most desperate need. Their mastery of tools and their adaptation to their environment was nearly perfect. In case of emergency, such as loss of air, they could put themselves into a state of suspended animation that would last indefinitely. They had developed telepathic communication to a high degree, but still they needed knowledge.

When he stressed that point Leni listened. She had been listening before, but now it seemed that her whole being concentrated on Strike's words. She even stopped fixing the glorious mass of platinum-blond hair





*"Ye're back!" The old man greeted him with friendliness  
—and the reporter was able to relax. One danger passed—*

that, in the gravityless interior of the ship, floated round her head like a halo. When Leni left her hair alone and sat motionless at his feet, listening, with her dark eyes remotely intent, Strike should have been warned. Apart from that he should have realized that no female, when presented with the dramatic, romantic tragedy of the Bevans, would be liable to act rationally, but he noticed nothing and kept on talking, telling of Durk Bevan, the dark, young giant who would succeed old Hugh to headship of the clan. As he spoke, Leni could sense the approaching tragedy of Durk Bevan's life. Armed now with all the knowledge and skill that the Bevans possessed, he would yet come to the realization of the hopeless futility of the tribe's fight for existence.

So while Strike talked, Leni sat and listened and thought and came to a decision some time before they came to the Asteroid Belt. Their course had been laid to contact the Asteroid Belt at the point from which Strike had left on his previous visit, Asteroid U483-L2. The automatic pilot delivered them faithfully; it had tapered off the course of the cruiser till it coincided exactly with the orbital speed of the asteroid.

THE TICKLISH business of approach was now up to Strike. Using two tractor beams and a slight repulsor-field activity for a reaction control, he nursed the ship carefully in toward the ten-mile-long bulk of the asteroid. They had got into their spacesuits and Leni stood by him in the control cabin; her hair was a



drifting silver cloud that practically filled the transparent helmet of her suit. Strike glanced at her once and wondered how the Bevans were going to react to a platinum blonde. Even with the shapeless bulk of the space-suit it was perfectly obvious that he had a female on board.

With infinite care he nursed the ship in closer to the bleak, crystalline, inhospitable surface of the asteroid. There was no suggestion of life or movement either on the surface of the asteroid or anywhere in the whole vast reach of the Belt as it stretched away from them and trailed far astern, fading off into the depths of space, a luminous cloud of smaller particles studded with larger chunks of crystalline debris, bright with reflected sunlight.

The surface of the asteroid crunched like frozen snow as Strike cut the repulsors, then there was stillness.

It had been quiet before, but even the silence of a ship in flight is built up on a background of tiny sounds—the muted whisper of the drive, the almost soundless hum of generators and the air conditioners—but all that was gone. Leni got it; she turned to Strike with a half-formed question on her lips as appallingly complete absence of sound flooded in on them. She forgot her radio communication. Strike smiled; his face seemed softer and less bitter. He had been a space tramp for so long now that coming back to the Great Silence was like a homecoming.

“That noise you don’t hear is the sound that empty space makes,” he explained to Leni.

She jumped; his voice was thunderous through her helmet receiver. She gulped nervously and the sound was as loud as someone emptying a bucket of wet cement.

“I suppose you get used to it?” she said hopefully.

For the first time in her life she distinctly heard the sound of her own voice. It was as unfamiliar as a stranger’s and she fought down an impulse to answer herself. She could hear the steady thudding of her heart and the rush of blood in her ears; her breathing was a world of sound in itself.

“Go ahead,” Strike suggested, as though he had read her thoughts. “Talking to yourself is standard practice out here.”

Leni ignored that. “Where are the Bevans?” she asked.

“Probably outside, figuring out whether they should sneak in and cut our throats or blow the ship up in one piece.” Leni looked at him quickly; she wasn’t quite sure whether she should be scared or not. “I’m not fooling entirely,” Strike said. “That’s what they usually do.”

The silence clamped down again and Leni stared out over the dead, motionless surface of the asteroid. The broken, jagged plain, stretching away to the near horizon, gleamed brilliant white where the sunlight touched it. The shadows were sharp-cut jet-blackness; there was no atmosphere to soften the glare or blend color. The only movement was the majestic procession of incredibly brilliant stars that climbed steadily over the horizon.

“Can’t we go out and meet them?”

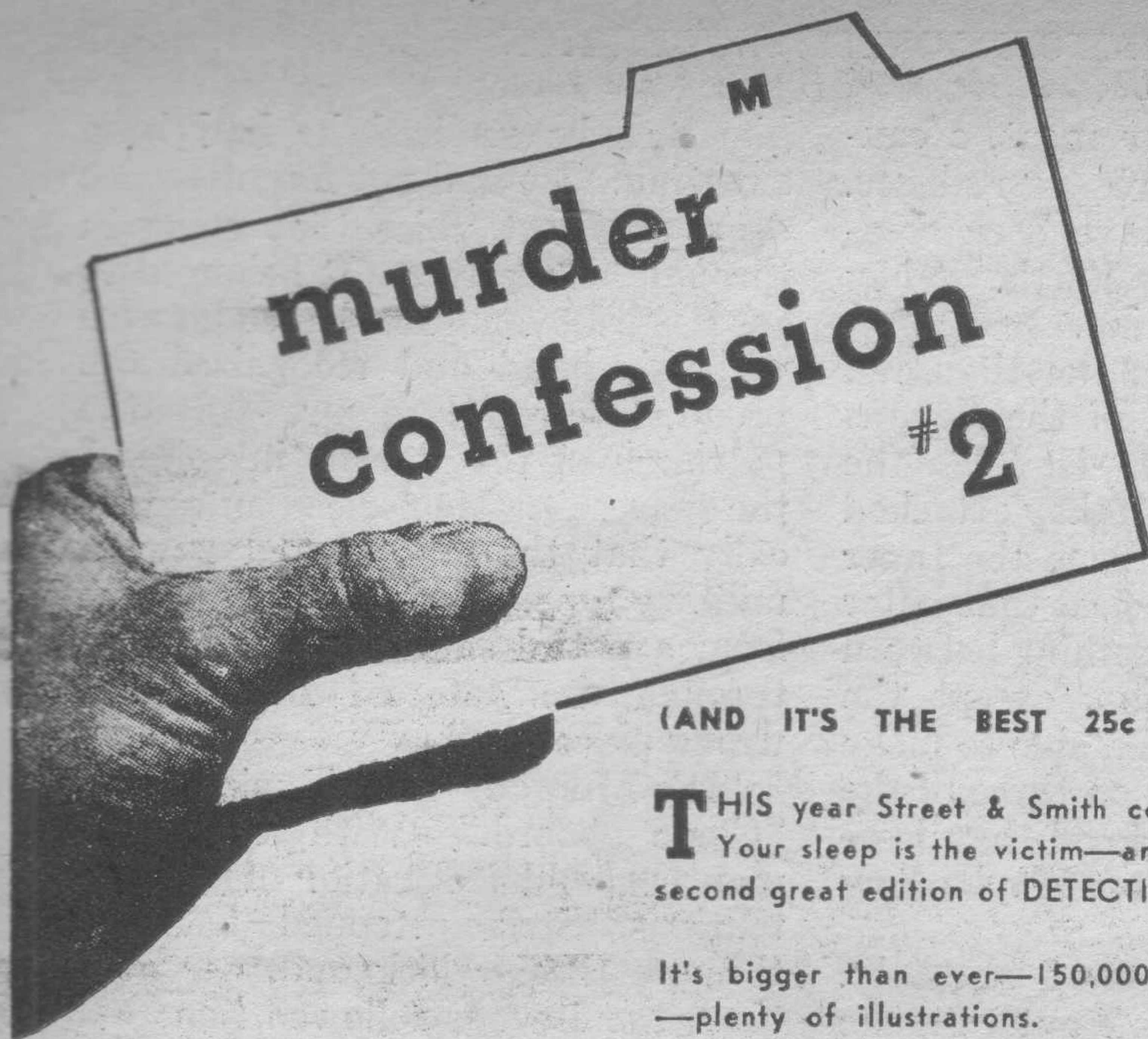
“We’ll wait a little—” Strike was interrupted by a clanging clatter at the forward escape lock.

Leni screamed half a scream and swallowed the rest.

“I guess they want to come in,” Strike said quietly. “You stay here.”

He stepped out of the control cabin into the antechamber of the air lock. He closed the inner door behind him and listened. He heard





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a slight sound of movement, a cautious scrape and crunch, then silence. The sounds would have been completely inaudible on Earth. They were out there—waiting.

Strike hesitated as the thousand stories he had heard of the Bevans ran through his mind. He knew the insane fury with which they attacked anything coming out from the Inner Planets. Once he opened that outer door there would be nothing between himself and extinction, except the impression he had been able to make two years previously on three of the wild Bevans who claimed they were the leaders of the clan. Maybe they weren't now.

He cut his thoughts off abruptly. He and Leni had come out to make contact and that couldn't be done from inside the ship. He snapped on the exhaust pump and emptied the air lock, then he released the sealing wedges of the outer door. Even after the pump had done its work there was enough difference between the pressure inside the lock and the utter emptiness outside to cause a slight hiss as the inside pressure dissipated.

With one last moment of hesitation Strike swung the outer door open. It was the sunward side of the ship. He stopped, abruptly, blinded by the glare and stood framed in the doorway, a perfect target. His stomach seized up at the thought and he froze where he was. Several seconds slipped by and nothing hit him. He let his breath go and got another one. His eyes were becoming used to the glare, his ears caught a sound. He checked the instinctive swing of his hand toward his sidearms. Then, without warning, a figure loomed up, silhouetted blackly against the sun.

"Is it Morgan?"

The tension suddenly went out of

him and he realized he had been sweating. He had not forgotten the deep, resonant voice that came in through his receiver. It belonged to old Hugh Bevan. He shaded his eyes with his hand and recognized the broad, powerful figure of the patriarch of the Bevans in spite of the spacesuit. He noticed automatically that the suit looked new, a military type. Probably it had come from a patrol ship that tried to go through the Asteroid Belt in the wrong place.

"It's Morgan," he said with relief. "Come aboard." With the space-man's age-old declaration of good intentions, Strike stepped back in through the air lock and, one at a time, the Bevans followed him.

OLD HUGH came first, a broad, powerful old man, then Durk Bevan, tall, wide-shouldered, with a mane of black hair floating above unfathomable dark eyes set in a lean, bony face. Storky Bevan slipped in almost unnoticed, a slim little elfin brown man with black, quick eyes that were everywhere at once. The three of them hinged back their helmets to show their faith in the good intentions of their hosts.

"I'm glad to see you again, Morgan," old Hugh rumbled. "It's many long years since any man of the Inner Planets has come twice to the Belt."

Strike grinned. "Yeah, I see you're pretty well equipped. I guess a patrol ship stopped by and left you those suits."

Old Hugh rolled the foundations of a grim laugh around inside his barrel chest. "That's not all they left," he said significantly. "Doubtless you'll remember Storky and Durk."

Storky nodded gravely, but Durk didn't make a move. He was busy staring at Leni and Leni didn't seem



to mind. With her halo of platinum-blond hair she was strikingly well worth looking at. Strike glanced at her and felt a vague twinge of uneasiness. He got the impression that Durk looked all right to her, too.

"This is my assistant, Leni Mai," he made the introduction hurriedly. Durk turned to him, then.

"Your wife?" he suggested tentatively.

"No," and the way Leni said it, it sounded very definite.

Strike frowned. She didn't need to pick it up as fast as that. With an uneasy feeling that a complication was setting in, he turned to old Hugh and plunged into an explanation of their expedition. When he had finished, the elder Bevan sat clawing his fingers thoughtfully through his bushy gray beard. He flashed a quick, keen look at Strike.

"So you figure them Allenstines are cooking up another brew o' hell for somebody?"

"Something like that," Strike agreed. "The boss figured that some way it would possibly threaten the Earth."

"Ha, so," Hugh said thoughtfully. "Well, that would make no mind to us, y'understand. Was a time once when we thought much of the Earth, but that's long gone; seems now we don't care much what betides y'there."

"Except that you'd be short the odd ship to plunder if anything was to interfere with interplanetary traffic," Strike pointed out.

Hugh grinned. "Perhaps you have something there," he admitted. "Would you have some manner of notion what this menace might be? The form of it and suchlike?"

Strike shook his head. "The boss didn't know himself. All he knew was there was something. After we

have gone Outside and listened awhile maybe we could tell you," he suggested. It was a direct play on old Hugh's curiosity and he saw it had effect. "We figured on continuing right through and getting out there as soon as possible." He'd made the point, and a lot of his uneasiness evaporated.

Hugh wagged his beard in agreement and seemed about to say something, then his eyes veiled peculiarly with inward intentness. Strike's vague worries condensed chillingly again; these people were telepaths. Hugh was in telepathic communication with someone. Maybe Durk, or Storky or someone outside the ship. Whoever it was, Hugh hesitated. He looked obliquely at Strike.

"I was hoping you might like to stay around awhile and see how we do things here," he said invitingly. "You had not much time during your last visit."

Strike didn't bat an eyelash, but there was a peculiar sinking sensation in his stomach. He thought fast. Abbot hadn't exactly said that the need for speed was desperate. Perhaps it would be best to spare a little time to humor old Hugh and whoever it was that had been advising him. It was quite reasonable that these folk should be somewhat suspicious of strangers. Besides he had, at all costs, to keep on the good side of the Bevans.

"Well, we should really go straight out and get the job done, but I guess a couple of hundred hours won't make much difference," he said casually. "I'm kind of anxious to look around, anyway." He glanced at Leni. She looked to be completely satisfied with the set-up. She would be. He laid a brief, silent, comprehensive curse on all blondes. He had thought Leni Mai was different. Maybe, if he worked this right and



they got under way fast, nothing much would happen.

STRIKE SAT on the edge of his bunk, looking like a worried and underfed scarecrow. Leni Mai—coherent thought faded out in an inward burst of helpless rage. That hare-brained she! One good look at something tall and dark and she and Durk had disappeared. Abbot and his bright ideas! Sending a platinum blonde to interview a tribe of brunet astral hillbillies!

Strike got up abruptly and banged his head on a low shelf. He ground out a terrible malediction on the Bevans and all their work. That miserable, double-crossing Allenstine tribe was up to something that was probably smelly and these stupid, cow-brained Bevans were tying him down!

Strike stepped across the neatly compact cabin to the door. He'd see some people and say some things if he had to pull this hunk of rock apart to find them. He stepped out into the narrow, dimly lighted passage. There was no room wasted and no prodigal outpouring of illumination. These big-eyed Bevans had refined economy and conversation to an artistry that made it almost unnoticed. The condenser capacity of his body activated the dimly glowing light tube in the wall of the corridor as he passed, keeping him in a small area of illumination. He saw another patch of light approaching then he saw Leni Mai in the center of it. His surge of resentment against her absence was tempered by an indefinable sense of relief that she was still on the asteroid.

"Where have you been?" he demanded immediately.

"I was just coming to look for you," Leni explained.

"Just coming— Listen, girl, when

Abbot finds you, you're nothing. Just a paper hustler in the State library. Then he gives you a chance to come out here and do something really big and what do you do? Fall all over yourself because a pair of shoulders gives you the eye! Haven't you got any self-respect, girl? How do you know how many of these black-eyed, seminude shes that claim to be his sisters aren't his wives?"

Strike gave it to her the bitter way. If he could just get her sore enough at somebody, they might be able to break loose and get on with the job. But it didn't seem to go over. Leni gave him a very straight eye.

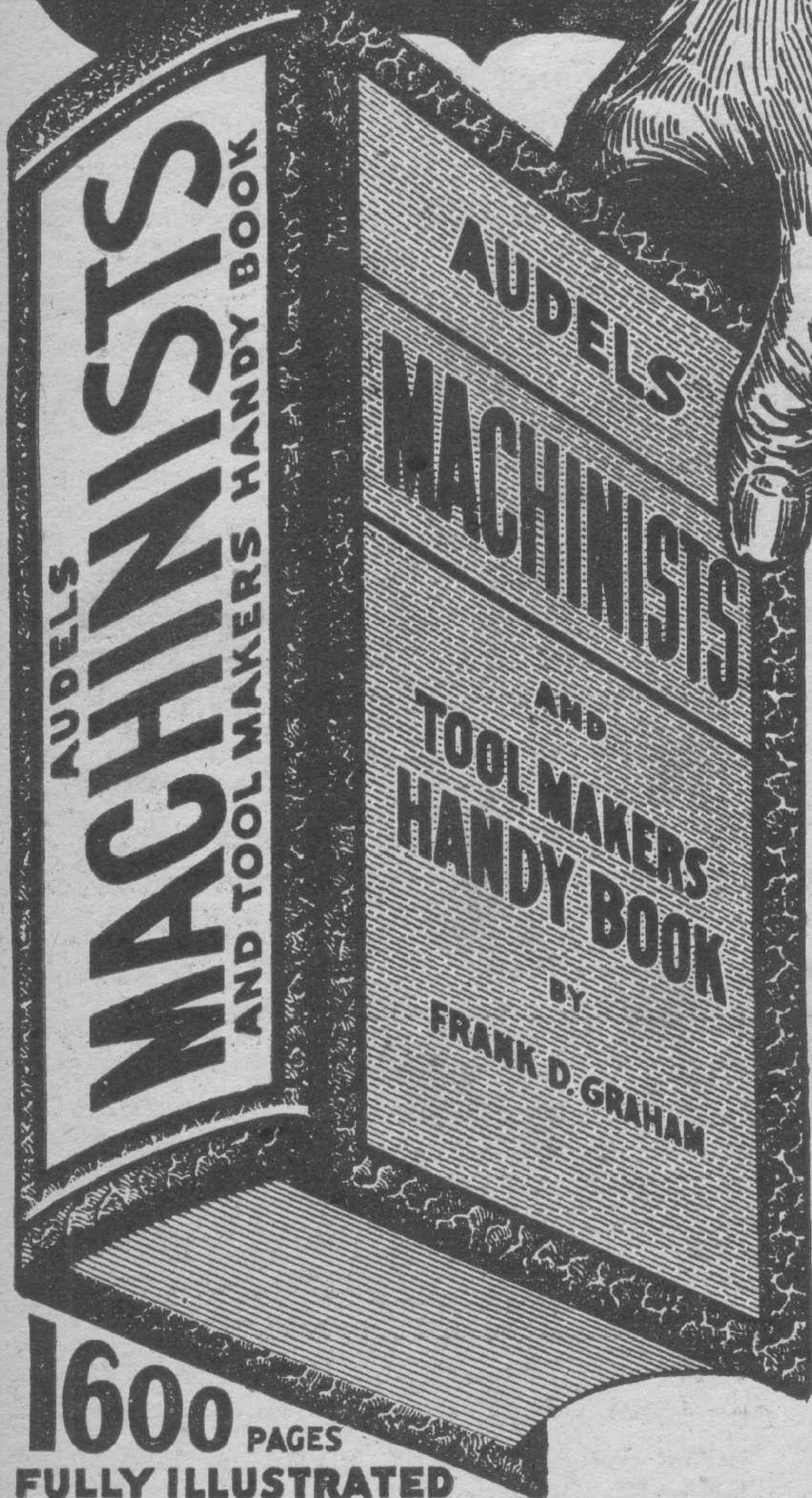
"They don't wear much because there isn't much to wear and those four you saw are his sisters," she explained. "And don't worry about any of the others; I'll take care of them." That guy Abbot was a genius all right. He'd pick a female 'cello out of a long-haired parlor string quintet and she'd promptly turn into a panther woman. "Besides Durk needs me." Strike groaned. When a she got an idea that some he needs her, anyone else might just as well give up. Leni went on: "I can remember most everything I've read and I've read most everything in the State library and with what I know and what Durk and his people can do with their hands, I think the Bevans have got a good chance of surviving. We were just going to look over one of the old listening posts to see if anything can be done with it. I thought you might like to come along, but if you feel like—"

"Aw, skip it, skip it. I'll come. I've got tired of sitting on my hands. The only thing I object to is you taking the only planet humans can live on comfortably and selling it down the river for a good-looking space hopper."



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"Durk's more than that," Leni snapped. Then she was beside Strike and laid her arm across his shoulders. "I'm sorry. You've been good to me and I thought you kind of liked these crazy Bevans, too."

"Yeah. And you can quit drooling down my neck. I like them fine. I knew them long before you did, but we've got a job to do! There's probably no more than three hundred thousand Bevans all told, and there's a couple of billion folks on Earth."

"I know," Leni agreed seriously. "I don't think I'm letting them down. I've got a hunch that these Bevans are going to be awfully important in a little while."

"Wait a minute—do you know something?" Leni shook her head and Strike knew she was avoiding speaking the lie and he knew her well enough to realize that she wouldn't talk till she was ready.

"Well, were we going somewhere or are you going to stand around being psychic?" he growled.

STRIKE AND LENI stepped away and drifted across the broken, airless surface of the asteroid toward the figures of Hugh and Durk where they waited on an upthrust outcropping of smooth, black rock. Leni landed beside Durk as a matter of course and Strike cut in his radio.

"Where we going?"

"To the Listers," Hugh's voice answered. "You will now see how we travel, Morgan, without expending enough energy to run a sun for a month." He stepped up to Strike and hooked a length of fine wire cable into the front of his suit. Leni and Durk were already similarly connected to each other.

"It's coming," Durk said quietly.

"What is?"

"Jump when I do," Hugh instructed.

"Jump? Hey . . . wait—" Strike leaped wildly as he saw old Hugh flex his powerful legs and hurtle into space. The wire sprung tight and snapped him into line behind the ancient. Then they seemed to be motionless. Empty space going by wasn't much use in gauging speed. Strike felt the line tighten again, there was a brief burst of flame as the patriarch of the Bevans corrected course with a small hand-drive unit. Strike got his breath.

"What the devil are you coming out here for? There's nothing—" His voice died away in a moan of terror. The swinging momentum of his first wild leap brought him around and he directly faced the onrushing bulk of a minor asteroid. It was less than a quarter of a mile away and it was rapidly reducing the distance. The roughly rounded mass of rock was little more than a hundred yards in diameter and Strike could see it was spinning furiously on its axis. He had about two seconds to pray and groan, then it was on them—and missed, by fifty yards or more, but Strike was willing to swear he felt the jagged surface brush against his boot soles.

The four humans swung in behind the slight gravitational drag of the asteroid. Strike, a trifle surprised to find himself still alive, watched the blurred rush of the high-speed surface below him. He started to congratulate himself on being safely out of its reach when he felt a tug on the line and saw old Hugh going down with a slight pluming flame from his drive unit.

"Hey! You crazy old goat, that thing's dangerous!" Strike yelled into his transmitter.

"It is that," Hugh Bevan agreed cheerfully, and they continued to approach the murderous, jagged surface.



Strike saw Hugh break out another length of light cable with something that looked suspiciously like a brick tied to the end of it. He payed out the line till the brick contacted the streaking surface below. It immediately rebounded and went swinging out past them. Hugh hauled it back, corrected position with his drive unit and repeated the maneuver. After half a dozen efforts the brick didn't rebound so violently and the surface below seemed to be slowing. It didn't take Strike long to figure out that the sideways throw of the brick as it rebounded from the surface was slowly swinging them into an orbit to match the axial rotation of the asteroid.

Old Hugh was using more and more drive-unit activity to keep their accelerating orbit close in to the surface against the throw of centrifugal force that increased with their speed. Soon the scarred and pitted exterior of the asteroid was just creeping by and then it was relatively stationary. There was a burst of fire from Hugh's drive unit as he swooped down, dragging Strike with him.

The lanky Earthman caught sight of the long line of handholds that extended like a ladder, out of sight, both ways around the asteroid. Old Hugh's huge fists clamped around two of them and hung on. The asteroid swung them around toward the Sun. Strike saw Durk ahead with Leni Mai swinging stiffly out away from the surface on the end of her line. Strike could feel his own towing bit dragging at the front of his suit. Then they plunged into the night and abruptly the pressure was gone as Hugh let go. Strike let out a quivering yell as they went spinning out into space, propelled by the heaving swing of the asteroid's centrifugal force.

"Something wrong, Morgan?" Hugh's voice came in over the radio.

"Not a thing, not a thing," Strike muttered. "What the devil would you guys do if you wanted to go somewhere and one of these animated boulders didn't come by at the right time?"

Old Hugh chuckled. "You need not worry about that, Morgan. Most of the bigger asteroids have one or two of these spinners circling about for satellites. They can be caught most any time. The lettin' go at the right moment is the trick of it. Myself, I've circled the Belt by them."

"Oh." Strike was beginning to see why the corporation and the Defense Fleet had had some trouble trying to dislodge the Bevans from the Belt. "How long is it to the Listers?"

"An hour and a little."

This was nothing in free flight. Strike had spent thousands of hours so with only the soundless deep of space around him.

THE ABODE of the Lister Bevans was just another asteroid with nothing but a broken, jagged tangle of rock on the lifeless surface that glared coldly white on the sunward side. There was no indication of habitation, but Strike hadn't expected there would be. The Bevans had been concealing themselves from their enemies for centuries.

The fifteen Listers were more of the Bevan clan with the same slim, dark wiriness, topped by a floating mane of jet-black hair. They had the same huge, dark eyes from a lifetime in the partial dark of their homes and the weakness of distance-filtered sunshine Outside. They stared with unconcealed admiration at Leni's blond gloriousness, which was understandable. She seemed to



glow like a living flame in the dimness. Durk Bevan towered, a dark pillar, beside her, practically bursting with pride.

"Well, what did we come for?" Strike demanded irritably when the introductions were finished.

"Something I read in Coddington's 'Journal,'" Leni muttered uncertainly. "He was out here with the first Bevans. He mentioned something about the listening posts—about their operation—I can't remember—" Leni's voice trailed off and her face grew inwardly intent as she explored the astounding filing system of her mind for the fugitive facts she wanted. "Oh, Durk"—it was half a moan—"I can't remember. I thought it would help if I came out here—"

Durk looked as helplessly anxious as a setter. "It would mean a lot if we could hear the Outside again," he said softly. "Maybe if I—"

He was interrupted by an inanely happy voice that babbled tentatively from the end of the dim room. The soft snick of a hastily closed door cut it off. Strike had seen the look that came to Durk's face only once before. It was when the tall Bevan had broken one of the fine hack-saw blades from Strike's repair kit. There was pain, self-accusation and the resigned knowledge that the accident was already in the past, then his eyes blanked out with the concentration of telepathy. It must have been for old Hugh. The patriarch glanced understandingly at Leni and spoke to the gray-bearded head of the Lister family.

"Bring him here," he ordered. All the life seemed to drain out of the old man's face. He nodded briefly.

In the dead silence of the room they heard that telltale door snick again and one of the Lister women came in with a big-eyed youngster.

The child looked like just another Bevan except that the face was blank, not just dead pan and concealing something, but wide open and empty. The eyes held a puzzled, disappointed, searching look that was hard to bear.

"Why didn't you put him out?" old Hugh demanded. There was rage in his voice and a sort of desperate ache back of it.

The elder Lister's voice was low and utterly hopeless. "We wanted him with us awhile. We thought he might . . . he lived from our share . . . he used very little."

"You fool, it should have been done when life was still young in him. The others of you might have come to harm with sharing." Old Hugh's deep voice was coldly accusing.

The stern-faced father of the Listers bowed his head in silent agreement.

"I was wrong. It will be done now." He reached out his hand to the youngster and the little fellow grabbed it with a burble of delight at being noticed. Lines of suffering etched deeper into the older Lister's face but he started for the air lock without hesitation; none of the other Listers made a move toward him. Leni blinked and shook her head.

"Wait . . . what is this . . . what are you going to do?" Instinctively she stooped swiftly and, before anyone could prevent her, she had the child protectively in her arms. She stared at them half fearfully, half defiantly, looking for an answer. It came slowly and bitterly from Durk.

"We are a dying race. We cannot keep imperfect ones . . . there is not enough."

"You were going to put him out there . . . without . . . without anything." Her voice was low, almost a whisper. "No . . . you



can't . . . it's not . . . you can't—" But she didn't sound as though she was even convincing herself. She had seen enough to realize that those who dared to live in the Asteroid Belt had to compromise with its rigors. She knew the preciousness of life here and the terrible reluctance of these men to snuff out any spark.

LENI'S EYES were deep pools of pain as she started to hand the child back to its stern-faced father. But the younger Lister evidently liked it where he was; he let go a rippling crowd of laughter and locked his arms around Leni's neck. The infant's father dropped his hands and looked helplessly at Hugh Bevan. The ruler of the Bevans started to say something, choked on it and stopped. The infant in Leni's arms was enjoying

himself hugely. He leaned back and proudly gave forth his greatest accomplishment.

"It appears that the tuning factor for the ultra-short frequencies is a compound of axial declination from the plane of the ecliptic and axial rotation speed," he said distinctly, pronouncing each word with careful precision and a complete lack of any inflection that would indicate understanding.

"Huh?" Strike started forward with a grunt.

Leni's mouth dropped open and she stared at the infant in amazement. "Di-did you say that?"

The elder Lister cut in hopelessly. "It is just the family chant. There is much more and we all know it, but this poor little one could not even do that properly. He puts in parts of his own that we have not taught

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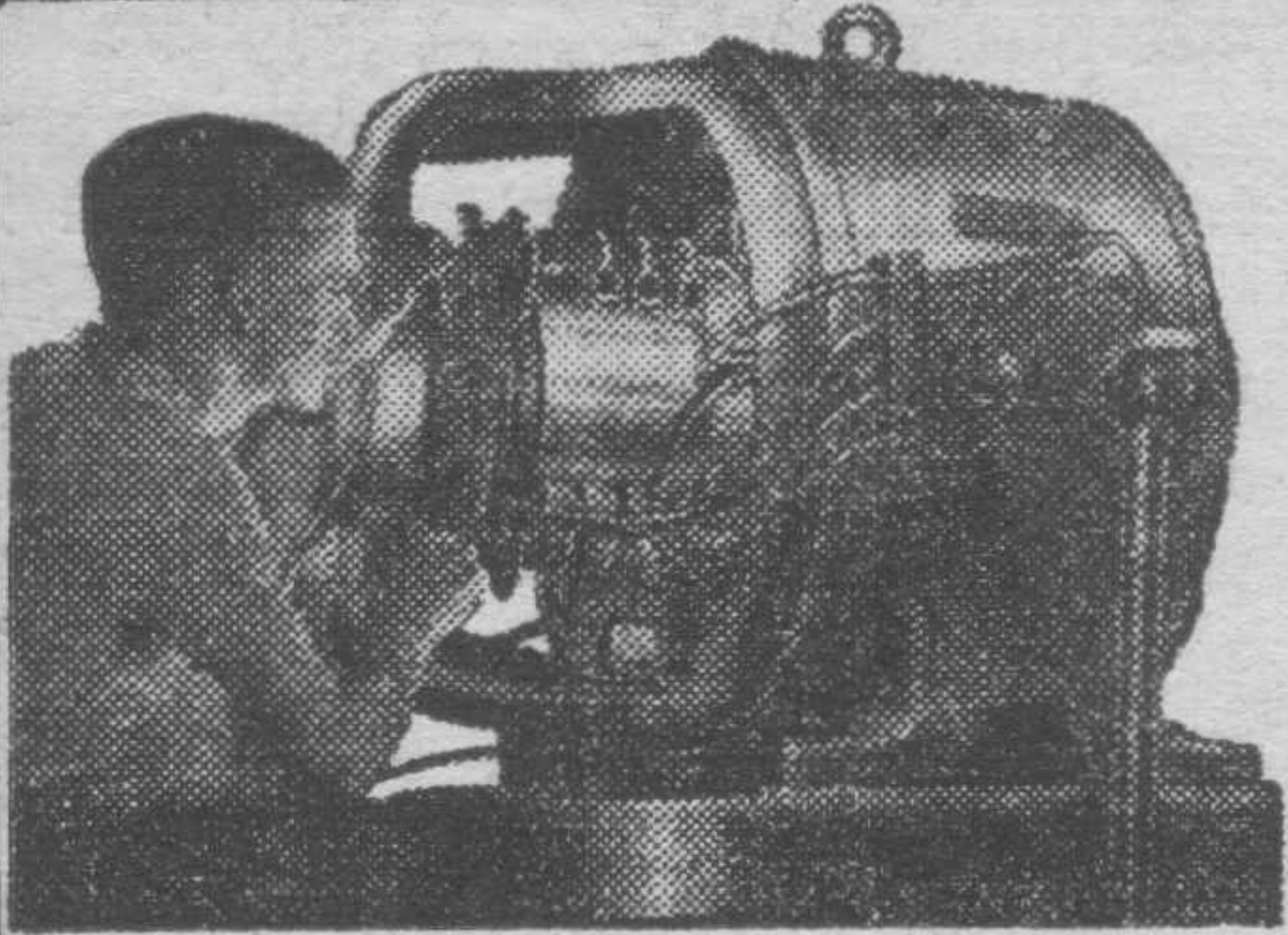
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him. Give him to me and I will do what must be done."

Leni gazed blankly at the Lister as though she didn't see him.

"Get away," she snapped irritably. The elder tried to stand on his offended dignity but Leni ignored him.

"Strike—Durk! That was a direct quotation from Coddington's 'Journal'! Who are these Listers?"

Strike laughed a short length of half-scared laughter. "Lister? Make it Listner and you've got something. The ancestors of these must have operated the posts. That family chant will be what they remember of their operating code and that kid you've got remembers more of it than any of them."

Durk blinked in bewilderment. "I don't understand. Can this young Lister help you remember?"

"Remember? I don't need to. This little fellow probably knows it all. And you were going to put him Outside," Leni accused. "You men are all alike." She turned to the elder Lister. "Let's have that family chant," she directed. "Strike, you get this down and don't miss anything." Leni took charge and started to run things.

Four hours later she was still running them, and the long-unused operating code of the Bevans' listening posts was beginning to shape up.

"It's the whole asteroid," Leni explained. "The whole thing is just a natural crystal pickup; it's tuned by moving it. I wonder if the rotating equipment is still intact." She turned to the elder Lister. "Have you ever altered any of the interior arrangements of this place?"

"Oh, no," the old man told her in a shocked voice. "The works of the ancients are never altered; we have simply built our rooms around the equipment that has always been here."

"Good; we'll tear that all out," Leni decided.



"Then the Listers will have to be moved," Durk said worriedly. The limited accommodations of the Asteroid Belt made finding new quarters for a whole family a major problem.

"They can go in our ship—" Leni directed.

"Hey, wait a minute—" Strike objected. He caught a look from Leni and subsided. "Hell, I thought I introduced you as my assistant."

"—and you can bring the ship over here. We'll be needing equipment and power."

Old Hugh let out a deep, fiendish chuckle and tipped his helmet shut.

"We Bevans could teach you something in the handling of women," he suggested over the privacy of his helmet radio. "Come on, Morgan; the plan is good."

STRIKE FOLLOWED Hugh Bevan out through the air lock and got an hour and a half of mad scrambling through the wild tangle of the Asteroid Belt. He returned with his nerves feeling like the end of a hammered rope.

At the end of fifteen hours of uninterrupted work all the interior fittings of the asteroid were stacked on the outside surface and with eager curiosity the spacesuited Lister family filed aboard Strike's ship in strict order of precedence. The little moron, navigating happily under the protection of Durk's very definite orders that he be left undamaged, brought up the rear.

Inside the asteroid Durk and Hugh Bevan stared at the massive gyroscope their ancestors had hung in the middle of the roughly globular interior.

"Oh, it's a fine, great machine," old Hugh decided.

"What does it do?" Durk asked with awed respect.

"It is a stabilized center to swing the asteroid around. The whole gyroscope is just an early-type magnetic reaction motor. That big wheel in the center is the rotor; the field coils are mounted in the trunnions all around the edge. They must have quit using these when they started to conserve power."

"I have read about such motors," Durk volunteered.

"Read? Where?"

"Oh, we have books by the ancients," Hugh spoke with pride. "Durk reads them well."

"I'll have to get a look at them," Leni muttered.

"Some of our emergency power packs might turn that refugee from a scrap pile," Strike decided and spent the next two hours installing the power source and earning Durk's increasing admiration.

"As near as I can tell, we're ready for business," Strike decided finally. He fed power slowly into the gyroscope and built it up to speed. The bearings were still perfect and the great wheel spun soundlessly. "Look up Channel 64B. That's what the corporation has been using for private talk."

Leni consulted the operating code and for twenty minutes Strike braked the mass of the asteroid against the stability of the gyroscope as he worked it into position.

"That should do it," said Strike as he cut in the audio circuit.

The measured, impersonal voice of a voder came in, solemnly reciting complete nonsense. It was the corporation's idiomatic word code, as difficult to break as solving a new language.

Leni nodded vigorously. "That's it, Strike. Get it down and I'll decode it for you later."

"Sure. Hey, wait a minute. Where are you going?"



"Durk and I are going back to look at his library. The Listers will help you bring the ship back."

HOURS LATER Strike delivered a shipload of Listers to the headquarters of the Bevans, then found Durk and Leni in Durk's laboratory, library and living quarters. He shoved his notebook at her.

"Here it is. Do your stuff."

"Yes, in a minute," she brushed it aside as though he hadn't spoken. "Look at this book, Strike. It's an original diary by one of the first Bevans. The Research Board of the library would sell their souls for this single—"

"Well, right now I wouldn't give you a kick in the teeth for it. Get busy on this decoding business. I want—"

"—and look what I found in the back"—she opened the tough old metal fiber pages with careful, reverent fingers—"see, Madison's formula—or most of it. Evidently one of the old Bevans started to work out the beam interference generation principle three or four centuries before Dr. Madison was born. The only reason the Bevans didn't make it was because they didn't have a cyclon distorter to alternate their beams—"

"All right, all right! So Dr. Madison can interrupt a magnetic field with an alternating power beam and build up a static electric charge. A big enough field and a long enough sweep for his beam, and he builds up a lot of static. So what? Nobody wants it when he's got it."

"Don't be so stupid!" Leni yelled. "What about the magnetic field of this asteroid? What about mounting a power-beam transmitter on the satellite that threw us over to the Lister's? What about letting the axial rotation give the beam its sweep— No. No, Durk. It's all

right. I'm not sore at him."

"Huh?" Strike jumped and saw Durk slipping a long knife back into its sheath.

"We Bevans do not usually expend so much energy unless we mean it," Durk explained.

"Well, we Earth people do. In fact, we very often do," Strike explained hurriedly. "Now look, Leni," his voice started low and rose, "if you'll be a good girl and work out this blasted code mess, I'll build you an interference generator as big as six moons!"

"You don't need to shout," Leni told him coldly. "I'm only six feet away, unfortunately. Give me your notes and don't anyone disturb me till I'm through. And I'm not fooling about those interference generators. You can spend your time looking through that diary. Durk will help you," she added significantly.

"I'm sure he will," Strike said to the closing door. "I'm sure you're going to be a great help, Durk, old pal."

THE DOOR OPENED and Leni came in so quietly Strike almost didn't notice. He looked up in surprise.

"Through already?" Leni nodded.

"I've been three hours."

"Uh-huh. Say, Durk, and I've really got hold of this business. I can't see that it'd do much more than give you a terrific charge of static, but that's a start at least. If we had the rest of Madison's formula, it would help. I'll ask Abbot to look it up when we send in that mess of code stuff. You get it undone?"

"Yes. And you don't need to bother Abbot about the rest of Madison's formula. I can remember it."

"Swell, What did— Say, what's the matter with you? Hey, for gosh



sakes, girl, sit down! Durk, get some water or something—”

“Oh, leave me alone. I’m all right. Just read what I decoded and you’ll feel sick, too.”

Strike grabbed the notebook and read swiftly. He stabbed a glance at Leni. “You didn’t make any mistakes?”

“No.” Leni’s eyes were big and scared.

“Durk, get Hugh here,” he snapped. “He ought to know about this. Well, go on, don’t just sit—oh.” He saw Durk was busy telepathing.

Old Hugh followed his beard into the room before Strike finished reading Leni’s breakdown of the message. Durk nodded toward Strike in answer to the patriarch’s inquiring look.

“Something troubling you, Morgan?”

“We found what we came looking for. This is what came through to the listening post. It’s from Commander Husing. He describes himself as in charge of the Outer Planet’s Defense Force. That’s the first time I’ve heard of them. Abbot must have been right; the corporation has been diverting the Inner Planets’ defense units to the Outside. Now get this: ‘Bases on Jupiter have been destroyed—defense of colonies on Ganymede and Callisto is being abandoned. Conducting strategic retreat to Asteroid Belt to attempt defense of Inner Planets till character of enemy can be studied, according to original plans of war department. Some of fleet should escape; faster units have more speed than enemy in straightaway flight. Enemy highly maneuverable; hope Asteroid Belt will restrict maneuverability. Prepare defenses of Asteroid Belt with all possible speed. Further orders to defend Outer Planets’ colonies will be ignored.’”

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"Seems like our folks was out there once," the older Bevan mused. "And you want to send this message through because you think the corporation will stop it at the Belt?"

"That's the idea."

"And this enemy. You think it's not any of your people but some other folk from another place, perhaps, who'd be no friends to us?"

"Now you're getting it. Do I start transmitting?"

"Aye. Do so," Hugh directed slowly. "We Bevans are still of the Earth race. We'd want no strangers breaking in on our private disagreements." Which, Strike decided, was a mild sort of thing to call exile, persecution and attempted extermination.

He got into his spacesuit and hurried out to the ship.

"WELL, what did Abbot have to say?" Leni demanded.

"Oh, Martin Abbot is a very fine and intelligent sort of fellow," Strike said carefully. "He tells me that information has been leaking in from other sources. This outfit that the Defense Force is battling is apparently a race of something from outside the System. It seems that their approach has been suspected for a number of years and that plans were made to form a defense line here in the Asteroid Belt, if they proved belligerent or capable of much destruction. Well, they've turned out plenty tough—just moved right in and started shooting up the premises.

"They won't or can't communicate. The Defense ships in the area were ready to retreat and evacuate everybody but the corporation didn't want to give up their properties, and they had enough influence with the High Command to countermand the idea. Instead they had more ships sent out and colonists—at least they called them that. They



were just dumped down in fortified positions around the Callisto bases and they had no choice but to defend themselves. Now they've been wiped out and what's left of the Defense ships are retreating for here. And here's how he finished:

"Defense Fleet is under constant attack. Very few units will reach the Belt. Suggest you enlist Bevans and do everything possible to reinforce defense positions in the Belt." Strike threw the sheet down and kicked it into a corner. "The Defense Fleet, with every modern piece of destructive equipment there is, couldn't make a dent on this bunch that's coming in, so wise guy Abbot says, Strike, old pal, you and your hillbillies tear them apart barehanded. Nuts!"

"Can't we do something?"

"We haven't got any power," Strike gritted. "If there's going to be any kind of defense, we gotta have power for repulsor fields and we gotta have time. Abbot figures there's not more than about three weeks."

"We could build a beam-interference generator," Leni suggested tentatively. "I can give you the rest of Madison's formula."

"AAAAh—don't be infantile. What'd we use a charge of static for?"

"Well, I don't know, but I think we should build one anyway. Maybe we'll think of something. Durk, help Strike with the building, please."

"What? Now look here, girl, I've had about enough of this. If you think I'm going to—" Strike's voice tapered off in a gulp. He saw Durk looking speculatively at his throat at a point just below his Adam's apple. The Bevan was sitting perfectly still, but Strike had seen how fast those long-fingered hands could

move. He glanced back at Leni, but that sweet little blonde looked about as yielding as polished tool steel.

"O. K., O. K., so I spend the last days of my life proving Dr. Madison's screwy theories."

OLD HUGH himself and Storky Bevan with a couple of the Listers helped Strike and Durk during the six hours it took to anchor a power-beam transmitter and alternator on the whirling satellite that circled the Bevans' headquarters.

According to Dr. Madison that's all that was needed, an alternating power beam cutting intermittently through the magnetic field of the asteroid, but after half an hour's operation nothing appeared to be happening.

"You can quit looking at me like that," Leni snapped. "Can I help it if Madison made a mistake?"

"Well, I hope he knows what to do with the buck now you've passed it to him," Strike grunted and started to fold himself down onto one of the locker seats. "Yaaaaaah!" the yell ripped loose and Strike went with it in a flying bound that banged him into the ceiling and bounced him down onto the floor again. "It stabbed me! Who did that?" He glared suspiciously at Durk, but the Bevan's long knife was still in its sheath.

"Nobody was near you," Leni told him thoughtfully. She went over and sat down carefully on the seat; nothing happened. "You try it, Durk." She got up and Durk sat down confidently. With a startled grunt and a leap he hurtled to the ceiling and slammed down beside Strike.

"Don't mind me, pal, come right in," the lanky news hound invited. He turned toward Leni. "Listen,



girl, I've said harsh words to you in the past, but I'll take them all back if you'll just call off your familiar spirit."

"Don't be silly. When you and Durk and the others came in here you weren't carrying any particular static charge and your suits have insulated you since you got here. We've all been charged up with the rest of the asteroid since this generator started. You just took it all on at once. It's perfectly simple."

Strike grunted and climbed disgustedly to his feet. "We practically get the pants burned off us and it's perfectly simple. Looks like this Madison guy wasn't crazy, though. Come on, Durk, let's go out and see what's doing." Strike closed the helmet of his suit and led the way out through the air lock. He stepped outside from the secondary chamber and a mighty hand grabbed him and tore him off the surface of the asteroid.

With a terrific, plunging jerk one foot yanked him to a stop. Both arms and the other foot strained irresistibly above his head, away from the surface. Durk hauled him back into the air lock. Strike sank down shakily as the outer door closed.

"I thought I was gone," he muttered feebly.

"I saw you start out in a hurry so I caught your foot," Durk explained. "Where would you have been going?" he asked interestedly.

"Out to take a look at Pluto by the way I started," Strike grunted weakly. "I guess I should have expected it. We're carrying the same static charge as the surface of the asteroid and like charges repel. Let's get back inside." He told Leni what had happened. "And it looks like we won't get out on the surface till the power packs run out on that beam transmitter."

"Oh, no, we can leave when we want," Durk said. "We can go somewhere else. That repulsion will help, as soon as we have calculated the strength of it and know where it will take us."

"Well, that's better," Strike breathed. "Have you got any observation posts so we can look outside?" Durk led the way to the end of the main corridor and slid back a heavy metal panel. A three-foot-thick quartz window filled the entire end of the corridor.

"Look, there goes our moon." Leni pointed to the gleaming white disk of the satellite that turned gibbous, sliced smoothly to a quarter moon, melted down to an old, thin crescent and sickled off into nothingness as they watched.

Durk's voice dropped into the silence. "It doesn't look so big."

"Whataya mean?"

Durk's eyes dimmed down in telepathic communication and a few seconds later old Hugh pushed in beside them.

"We'll watch till it comes again," Durk said.

Strike felt a building tension. "What's it all about?"

"Maybe nothing. We'll see when it comes again."

JAMMED uncomfortably together in the narrow passage they waited tensely through most of half an hour.

"It should come now," Durk muttered.

"There it is," Hugh rumbled thoughtfully, deep in his chest. "But it's late and as y'said it's smaller. These things would be indicating a wider orbit, I think."

"If it's getting smaller and coming later, it must be getting farther away." Leni's voice sounded puzzled.



"Of course it is," Strike stated flatly. "We should have thought of that. A power beam transmits both ways. The static charge has been draining off to our moon since we started generating; the two of them might as well have been connected by a cable. Now they simply repel each other and part company and that's the end of your generator. Dr. Madison forgot to mention that both units of the proposition needed to be anchored down firmly."

"Durk, how many of these asteroids have got spinning satellites?" Leni asked abruptly.

Durk hesitated. "Very many. We don't know just the precise number, and there are others with moons that don't spin."

Leni went off at another angle. "Will the Defense Forces be ahead of their attackers, Strike?"

"Should be, some. Seems to me the ones that can't run fast enough will be eliminated long before they get this far— Say, what are you getting at?"

"It's kind of a ticklish business navigating through the Asteroid Belt, isn't it?"

"Yes, it is. You've got to know pretty well what all the hunks in the immediate vicinity are going to do before you start, but what's that got to do—"

"Don't you get it?"

Strike stared at Leni, slow comprehension dawning. His throat seemed to dry up.

"You're crazy, girl; we couldn't make it in time," he practically whispered. But he had a sick conviction that this slim gloriously blond Earthgirl and a wild gang of black-browed, astral hillbillies were going to try throwing rocks on a truly cosmic scale. He licked his lips. "I hope I'm wrong, but what I think





you're thinking is that you'll install interference generators wherever there is an asteroid with a satellite, build up static charges and disrupt the asteroid orbits with them at the right moment."

"You follow fast," Leni agreed dryly. "It's worked here. If we can push one satellite around, we can push a lot of them around. Do you get the idea, Durk?"

Durk nodded. "There'll be a lot to do; we'd best be starting."

"Do? I'll say there's a lot to do and you haven't got time. Everything will be all shot up long before you can even begin to visit half enough asteroids to make installations."

"Oh, we'll stay here," Durk explained. "Have you another beam alternator or do we have to chase that one that just left?"

"Sure, we got another. What the devil do you want it for? One's no good."

"Don't talk so much. Just go and get it," Leni snapped.

Strike swallowed a string of remarks and did as he was told. When he got back, Durk's quick, powerful fingers were busy building a replica of the power-beam transmitter. The Bevan was working entirely from memory.

"Will you check this for errors?" Durk asked without relaxing his concentration.

That was the final word. Hugh and Storky, some of the Listers and most of the women got in on it before it was done. They worked in dead silence, their minds so perfectly subjected to Durk's guidance that a dozen pairs of hands worked practically as his own.

In four hours they had completed a replica of a piece of equipment that one of them had seen only once.

With Strike helping, Durk connected in the alternator and the job was finished.

"Well, there's one. Now what?"

"We will tell others to do likewise," Durk said absently. He sat down on a locker seat and stared at the mass of apparatus. Ten minutes later the rest of them took up the same type of activity, or inactivity, just sitting and staring at the equipment, their eyes inwardly intent with the concentration of telepathic transmission. After half an hour of dead silence, Strike fidgeted.

"Say—"

Leni shushed him fiercely.

Occasionally one of the Bevans got up, and walking as though in a trance, moved around to get a different angle on the proposition.

Strike stood it for four hours. "Look," he muttered to Leni. "I got to get out of here. I've taken all of this deathwatch I can stand."

"I'm right with you," Leni whispered.

"They may have to keep it up for days," she said in an awed voice. "They're trying to transmit instructions for the building of apparatus that none of the other Bevans have ever even heard of before."

"It's plenty terrific," Strike muttered.

The silence in that room dragged on for a week; none of the Bevans left, none of them ate or slept.

"Dammit, we don't even know if they're getting through," Strike burst out. "We don't even know if they're doing anything. They may have decided that it's no use and just be sitting there dying, or something. I wouldn't put it past them. They figured they're doomed by degeneration anyway."

"I don't think they'd do that," Leni murmured uncertainly, but a



week of silence and immobility was getting on her nerves, too.

FOURTEEN DAYS after Durk built his first equipment, the Bevans came out of their trance. Durk told Strike and Leni what they had done.

"It's finished. Twenty-eight hundred asteroids with spinning moons will be in the vicinity of the two main passes through the Belt that the Defense Force uses. They have been equipped with beam-interference generators."

Strike gulped. Twenty-eight hundred wandering, unpredictable moons! Abbot said the enemy was highly maneuverable. Well, they sure would have to step briskly to avoid that storm of satellites.

"If there is anyone left on the Inner Planets when this is over, you Bevans are going to be pretty popular," Strike managed.

The wild bitterness engendered by centuries of exile curdled old Hugh's deep-throated laugh. "Ho, we save the people of the Inner Planets from those that would destroy them and we may go visiting? Well, so be it if that's what they wish. We will do what we can here and afterward we shall see what will happen."

Hugh chuckled deeply and Strike didn't like it; there was too much fiendish anticipation tucked away behind the old villain's beard. Then he saw Durk's lean, triangular face below its floating mane of jet-black hair, smiling a secret, wolfish smile. Leni looked as complacently self-satisfied as a cat that had discovered a method of removing the caps from cream bottles. Strike laughed softly and a little ruefully to himself.

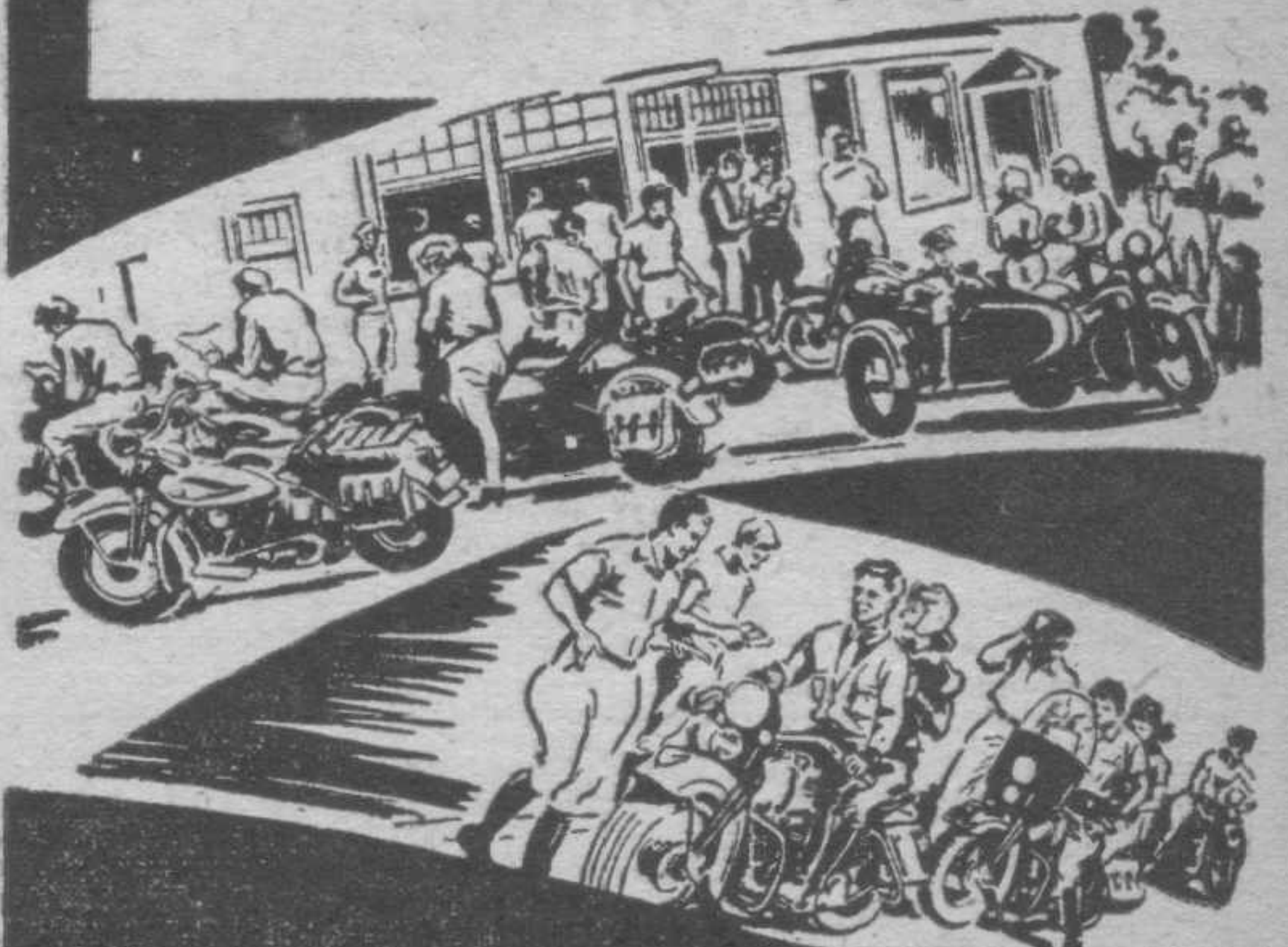
THE RADIO receiver burped gastronomically and stuttered out a deep, resonant challenge as Strike carefully sorted his ship down the

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Belt in the direction of the two fortified passes.

"Defense area. We're being warned off," he explained. "We must be in the vicinity of the passes. We should —" Something grabbed the ship and slammed it sideways. "Mygodamine," Strike grunted as he lurched over the control panel and warped the ship into the most critical direction change of which it was capable, driving away from the mined area. "Those crazy fools must be scared silly," he grated. "I bet they've been blowing asteroids apart for the past month." The radio started in again.

"Commander Husing coming in. Eighteen ships—correction—seventeen ships. Attacking craft are spherical. They are very close, some may be ahead. Have destroyed four by bracketing barrage since action commenced. Ammunition low, firing single salvos as interference factor. Enemy extremely maneuverable, very difficult to hit. Heavy cruiser 189 has ceased reporting—sixteen ships coming in." The radio went silent.

"Sixteen out of a couple of thousand." Strike had been inured to tragedy and disaster through a lifetime of reporting man's battle with the System, but there was shocked unbelief in his voice as he spoke. "They couldn't hit them with anything less than a barrage," his voice was softly incredulous. A doubt was born and started to grow.

"They'll be in soon?" Leni inquired.

"About an hour. Hugh, you better have your gang start winding up their generators and we'll start getting out of the way," Strike decided and, in spite of himself, he felt a cold burble of anticipation in his stomach. "And, brother, I hope we've been guessing right," he murmured.

"Can't we get close and watch?" Leni demanded.

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"You can get close and get hit. There's nothing to see anyway until a ship blows up and that doesn't last long," he told her grimly. The radio picked up again.

"Commander Husing coming in with thirteen ships." There was a sort of grim, desperate resignation behind the words.

Leni looked a big-eyed question at Strike. "What's happening to them? We've got to get close. . . . Look!" her voice rose as she pointed. "That must be them!" Out beyond the Belt a sunlit swarm glimmered distantly like an extension of the Asteroid Belt.

"There's sure plenty," Strike grunted.

"It would seem they're bunching up for something," old Hugh observed calmly. A tiny group of sun-bright specks seemed to hang motionless ahead of the swarm.

"That's our outfit," Strike pointed out, and as he spoke the compact little group expanded terrifically in a blast of annihilating flares. There was stunned silence in the control cabin of the Earth ship. The radio cut in frantically.

"Calling Captain Robertson! Calling any ships of Defense Fleet! Asteroid Defense Base by—come in please." The long pause that followed was filled with nothing but foreboding silence. The radio slashed in again, the call sounding almost hysterical. Another carrier wave hummed across a third call.

"Defense Battery 18 under fire. Going into action with heavy batt—" A crunching rip and a thin, high scream stabbed through—then silence.

"That outfit must have been just playing with the Fleet up to now!"

"Asteroid Defense Headquarters.

All batteries, rapid independent. Open fire!"

The path of the invaders was laid across by a glittering gauze of explosions reaching far out in an impenetrable series of stepped barrages.

"The damn fools should wait," Strike moaned. The serried ranks of the enemy drew in and massed, just outside the edge of the explosion area.

"What are they going to do?" Leni's voice was high and tight.

"They're coming in," excitement built up behind Hugh's deep, vibrant voice.

THE ENEMY was a myriad of three-quarter moons where the Sun hit their spherical hulls. The whole great fleet had not ceased its steady approach. The barrage area grew even more intense and brilliant with countless bursting torpedoes and mines as the attackers moved in. A handful of brilliant flashes along their front told of bursting ships caught in the fury of the Defense barrage.

A series of tremendous, glaring bursts of fire blossomed suddenly out near the entrance to the passes. The radio cut into the tense silence:

"Asteroid Defense Base calling. Outer batteries report damage."

The only answer was the dead, aching silence of space. The scintillating glitter of the barrage area was thinner. The vast, flaring bursts of whiteness moved in ahead of the overwhelming swarm. Through a succession of age-long minutes they heard the Defense Base commander call the death roll of his batteries. Once or twice short, agonized responses came from the blasted stations before the hopeless silence clamped down. The commander's



voice cut through in a wild, dying scream. The carrier wave hummed for a moment—then it was gone into nothingness.

"That's all of them." Strike's voice was barely a whisper; his lips felt dry and stiff. "I hope we're right. Good heavens, I hope we're right!" It was the nearest thing to a prayer that Strike had ever achieved. The swarm of the enemy was well inside the Belt as he spoke.

"Hab! There is a moon for them to steer their ships about!" Old Hugh pointed to a ragged asteroid that wobbled an erratic, spiral course out in to the empty reaches of the pass. Toward the Outside there were several brilliant white flashes. "Collisions I would suspect," old Hugh rumbled complacently. "I told the people toward the Outside to start first, kind of cut off the retreat."

"Yeah, good idea," Strike muttered. He felt only an uncertain emptiness. He was scared clean through. That huge fleet had power, terrifyingly irresistible power. He cut in a long-range visiscreen. The forefront of the enemy fleet was just swimming into the extreme limit of the screen.

"Hugh, look at that!" Strike's voice was an awed whisper. The old Bevan stared in unbelieving silence. The errant, charged moon was staggering about the screen to give them a point of comparison.

"It's big," he said slowly.

"That ship must be at least a mile in diameter," Strike said softly as they all gazed spellbound at the huge, gleaming sphere that centered the fore of the advancing line of ships.

"Wha-what are they?" There was more despair than question in Leni's voice.

"There comes our moon athwart their course," old Hugh rumbled. "We'll see now. They'll not easily shift a ship of that size."

As he spoke the wandering satellite swam leisurely into position immediately ahead of the great ship. They moved together with ponderous, deliberate power, the great gleaming, featureless globe and the wandering fragment of an unborn planet. Dazzling white shafts probed out from the globe, their intensity far beyond the ability of the screen to reproduce. The wandering mass of astral junk simply burst into a glittering cloud that spread rapidly. The great globe surged majestically onward through the center of it for a few seconds. Then the screen was blotted out by a ragged, blasting deluge of light. Strike reeled as the terrific illumination filled the control cabin with momentarily glaring whiteness. Then it was gone and the light was only in their blinded eyes.

He struggled back to the screen and blinked his eyes back to normal.

"Look!" Leni quavered.

THE GREAT GLOBE was smashed wide open like a burst, rotten orange. The remains drifted clear of the cloud of shattered asteroid. They could distinctly see fragments of things that curled and writhed and died as they watched. Strike's mouth felt thick and cottony.

"Just lightning," he mumbled. "Just primitive, rip-roaring electricity on the loose! That asteroid moon was charged up with all it could take, even the cloud of its pieces still carried the charge. That ship got all of it in one jolt and as soon as the two halves of it were charged they ripped apart."

"We didn't think of that," Leni murmured.



"There's more happening out yonder," Durk told them.

The great enemy fleet had swept up behind their leader and the direction port showed them all they wanted to see. The main mass of the wildly uncontrolled, careening moons was swarming into the pass. Smashing into each other, the doubly charged flying fragments an even more deadly menace than the original mass.

The tearing, ripping discharge of static electricity became a tremendous, steady blaze. Smashed and battered fragments of asteroids, enemy ships and the useless Defense bases whirled madly in a tremendous maelstrom of destruction. The men in the Earth ship, with all the Listers ranged behind them, watched in voiceless wonder.

"Aye, and that will be the way of it," old Hugh's voice was a deep, satisfied rumble.

Strike swung around. "What do you mean?"

Durk answered. "These asteroids have stirred about once, mayhap they will do it again," he suggested.

Strike began to understand and Leni helped him. She stroked the fingertips of one hand across the palm of the other, there was a subtle gleam of feline, female acquisitiveness behind her eyes.

"At so much per ship that wanted to get out from the Inner Planets, we could see that the orbits of the Belt were not disturbed perhaps?"

Strike gulped. "A toll gate!"

Durk laughed softly. It was the first time Strike had heard the hungry-looking Bevan express anything resembling amusement and it sounded something like the kind of remark a wolf would make just before he tore the throat out of a fat sheep.

"Of course it would have to be our folk that took the ships beyond here," old Hugh added thoughtfully.

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"Naturally," Leni agreed and Durk nodded.

"It has been a long time," the patriarch of the Bevans rumbled thoughtfully, "but the word of the Ancients was true—we will rule all that lies beyond."

The words were a calm acceptance of destiny, and Strike felt a rich, warm flood of inner peace. This was as it should be; he could go home now to the warm green of Earth and leave the Outer Planets to these others, with a clear conscience. He saw the way of it now; humans had adapted again. It had taken three hundred years of isolation, but a breed had been produced that could go to the outer edge of the System. And beyond that— Well, the stars were there and with the mother planet to supply fresh stock for new variations—Strike saluted the future with a half smile of speculation—he was at peace with the Universe.

THE END.



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## BRASS TACKS

*Editorial note: The following material is abstracted from a speech by Dr. Max Mason, chairman of the California Institute Observatory Council, concerning the Mount Palomar telescope. It seems of interest to Astounding, both because it gives a report on the current status of the giant mirror, and because it makes clearer the planned uses to which the instrument is adapted.*

### CONCERNING THE 200-INCH TELESCOPE

The great 200-inch telescope to be erected on Mount Palomar is now approaching completion, thirteen years after the late Dr. George Ellery Hale convinced the Rockefeller Boards of the feasibility of such an instrument, and obtained funds for its construction.

The disk, about seventeen feet in diameter, originally weighed twenty-one tons, and during five years' grinding at Pasadena, more than four tons of glass have been removed. The disk is carried by a system of thirty-six levers inserted in the holes of the ribbed back. Both the method of support and the structure of the mirror are new in this instrument.

It is necessary that the supporting system operate so perfectly that no bending of the reflecting surface beyond one or two millionths of an inch will occur as the telescope moves. As the surface of the mirror was brought by polishing close to spherical form, it became clear that the disk, when tipped from the grinding table to a vertical position for optical test, sagged slightly under gravity. This sag has now been eliminated by installing a system of twenty-four squeeze levers, operated by counter weights, distributed around the rim of the glass. The spherical surface required has nearly been reached, after which it will be changed to a paraboloid by deepening the center concavity five-thousandths of an inch.

*It is doubtful whether the new instrument will be useful for photographing the moon or planets, due to shakiness of the air, which destroys detail. Instead it will be used to study faint and distant galaxies, and to analyze in high detail light from the stars and planets.*

But the 200-inch telescope will be used to study planetary radiations. Planets not only reflect visible light which they receive from the sun; they also absorb and then re-radiate considerable quantities of solar energy, largely in the form of infrared rays. In order to obtain much of the information necessary for the comparison of condi-



tions on the planets with those on the earth, we must first make a careful study of physical processes taking place on the Earth's surface and in its atmosphere.

Therefore the program of research will include determinations to an entirely new order of precision of the effect of water vapor, carbon dioxide, ozone, and the other major atmospheric gases on radiation.

Incidentally, the data obtained in these researches will probably be of very considerable value to meteorologists as well as to astronomers.

---

*Heinlein's speech at the Denver Science-Fiction Convention was recorded by electrical transcription methods, also printed version is available—*

Dear Mr. Campbell:

Believe your readers would be interested to know: "The Discovery of the Future," Robert A. Heinlein's dynamic speech, as delivered at the Third World Science-Fiction Convention and transcribed directly from the sonodiscs, is available in published form, priced at 10c, from—Assorted Services, 236½ N. New Hampshire, Hollywood, California.

---

*Those science-fiction conventions are worth attending, if you can make it. They generally turn out to be an interesting sort of shindig.*

#### 4TH WORLD SCIENCE-FICTION CONVENTION

The members of the Los Angeles Science Fantasy Society wish to announce that Los Angeles has been chosen for the 1942 WORLD SCIENCE-FICTION CONVENTION. Preparations are now under way, and the exact convention date will be announced later. At the present time we suggest that all readers who plan to support the convention should send \$1 to the convention secretary, Paul Freehafer, 349 S. Rampart, Los Angeles, for membership card, bi-weekly news mag and other special benefits. Watch further issues of Astounding for more details. Meanwhile, for a free sample copy of news sheet stating further

facts, drop a post card to Convention Director Walter J. Daugherty, 6224 Leland Way, Hollywood, California.

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*The eclipse lasted for one and a little over days—the whole planet was eclipsed during that time.*

Dear Mr. Campbell:

Though I wouldn't like to throw a monkey wrench into an otherwise good story, I would like to point out a little discrepancy in Asimov's story, "Nightfall."

I assume, in the absence of anything to the contrary, that the planet Lagash was inhabited on *both* sides. If this is true, then one entire hemisphere would still be under the light of five suns, while only one side would be darkened by the eclipse of Beta. I see no possible way that both hemispheres could be dark at once. Thus, the "Hideout" would be totally unnecessary, as a whole hemisphere would be illuminated. This, I am afraid, would completely do away with Lagash's so-called "cycles"—in fact, it would remove the significance of the story.

What about it, Mr. Asimov? What's the answer?

I am certainly sorry to hear Schneeman is in the army, as he was consistently your best illustrator. Keep Rogers on the covers, but not inside—no, definitely. His covers are extra good; it's a shame his inside pics are so lousy. Please get back Dold. He takes time on his illustrations, and his finished work shows it. Even get Wesso in preference to the Isips, Kramer, Kolliker, Binder, Eron, et cetera, who don't belong in Astounding. Yes, and what about Paul?

I'm glad to see you have finally conquered your modesty (?) and inserted one of your own articles. Now that you've made this step, please give us some of your stories. I'd give anything to read the "Mightiest Machine," I've read so much about it.

And follow up E. E. Smith's story with a serial by Williamson—something like the "Legion of Time," or "The Cometeers." How about it, huh?—Grady Whitehead, Jr., 4039 Byers Avenue, Fort Worth, Texas.

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*How to invent a drydock!*

Dear Mr. Campbell:

Permit me to elaborate a trifle on Sprague de Camp's article on Hellenistic scientists.



He refers to "uncannily correct" figures obtained by Erastosthenes (excuse it, please, Sprague, but that is the way I learned it, even if the Britannica has simplified to the way you use it—the Dutchman Snell who rediscovered Geodesy and wrote the foundation works for the modern science styled himself Erastosthenes Batavus. His measurements of a short arc of the meridian in the Low Countries jolted Huygens and Newton out of their comfortable theory the Earth was a sphere.)

The reason the first Erastosthenes hit the nail so squarely on the head—remembering that nobody knows for sure which of the great number of stadia he actually used—was that he had a lot of luck. He made his computations on two assumptions, both of which happened to be wrong, but of opposite sign. Assumption One was that Syene (Assuan) was on the tropic; Assumption Two was that it and Alexandria were on the same meridian. If only the first were correct, the arc would be too long. If only the second, too short, since Syene is some miles north of the tropic. The two errors canceled. It was more than a millennium and a half before anyone else bettered his results.

By the way, de Camp also says that in Hellenistic times there was no Pole Star—is was several degrees off the line of the Earth's axis, and they had to shoot at the center of the circle. Well, they still do. Polaris is more than a degree away yet. We usually grab a sight of it at either the upper or lower culminations.

Having tossed these mild brickbrats, let's get to an omission. A priceless old guy by the name of Pyrgoteles ought to be in the picture somewhere. He invented the drydock. Only it was an accident.

Pyrgoteles was a naval constructor for Ptolemy Philopater and decided to do something in a big way about battleships. The run-of-the-mine ship of those days was the *quinquireme* having five banks of oars. Demetrius the Besieger tackled Rhodes with an eleven-bank affair, but lost it. (See Fletcher Pratt's "Freak Warships," U. S. Naval Institute Proceedings, December, 1930.) This stimulated Pyrgoteles to construct a supermultireme of no less than thirty banks of oars. She was four hundred and eighty feet in length and needed four thousand rowers. She was a flop. Nobody knows what finally became of her.

Oh, yes—the drydock! The found they couldn't launch her, so they undercut her and let her down. Then they broke the coffer dam between them and the ocean

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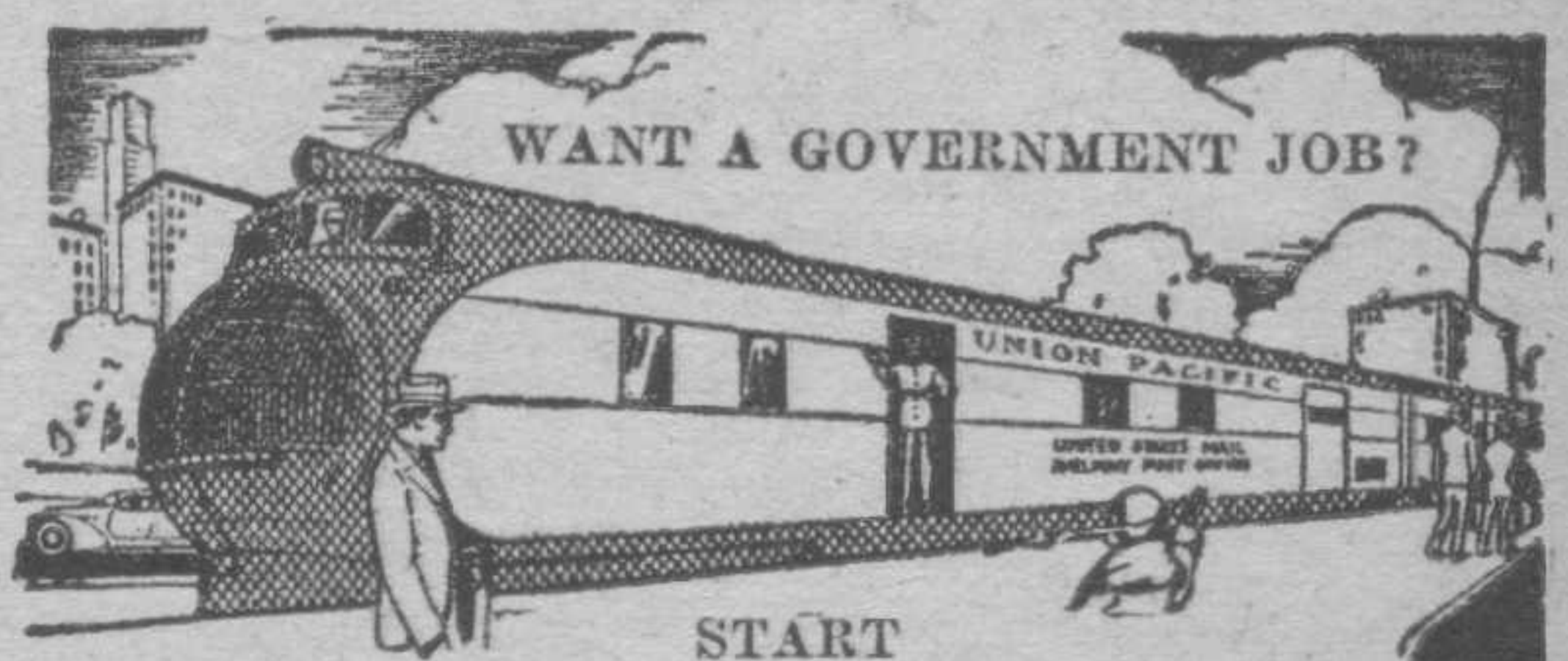
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and there they were. Necessity, you know.—Malcolm Jameson, 519 West 147th Street, New York, New York.

That Smith book would be approximately twice as long as "Gone with the Wind"!

Dear Mr. Campbell:

After reading the story "Solution Unsatisfactory" and the various attempts to find a satisfactory solution, I have succumbed to the urge to stick my neck out. It seems that the main stumbling block in finding a satisfactory solution is just plain psychology. Until people are able to recognize danger even when it cannot be seen, smelled, tasted, felt, or heard, none of the suggested solutions will be effective, regardless of how perfect the mechanical details may be worked out.

I can think of some mechanical defenses against radioactive dust which might be effective, provided there is sufficient lead available. Not only must all buildings be air-conditioned, but lead insulated against gamma rays. Also lead suits must be made and issued to the whole population. Foodstuffs must be transported in lead-insulated containers. And most important of all, the people must realize from the start, before the first attack, the necessity of observing all precautions. It does not sound practical to me. The last observation applies to all the suggested solutions also. And any solution that depends on education is far too slow to be of any value. By the time people are educated to technocracy, war will be one of the lost arts, and so no defense will be necessary.

Here is a suggestion for Mr. Brady's consideration. Work out an economic system which will conform to our present political system and approach as nearly as possible the technocratic ideal, for the first step. People are not educated to your ideals yet, and it will take some time to educate them. After they have been educated some, further steps will be possible. The biggest mistake any reformist can make is to be in too big a hurry. The social reformers are trying to do in one big revolution what can only be done in a lot of little revolutions.

I saw in Brass Tacks a request that "Gray Lensman" be printed in book form. Suits me, provided that "Galactic Patrol" be included in the same book. "Gray Lensman" is really a continuation of "Galactic Patrol" anyway.—Chester Evans, Columbia Hotel, Portland, Oregon.



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Dear Mr. Campbell:

I am inclosing a postal money order for \$2.00. Please enter my subscription to *Astounding* beginning with the September issue, and also send me one of those fluorescence kits. They sound very interesting. I realize this is a somewhat unorthodox method of obtaining said subscription and kit, but if I directed this letter to the Subscription Department you probably would never get to see the rest of it. Why is it that s-f fans love to let their hair down to the editor of their pet magazine?

First off, I agree with de Camp in a recent letter to *Brass Tacks* about the lack of argument in the *Brass Tackers'* letters. It is especially noticeable when contemporary missives are compared with those scorching the pages of *Science Discussions* a few years ago when it was the only letter department. Yes, the combination of Clark, Miller and de Camp was a mighty one. It always brought to mind Tinker to Evers to Chance! However, I disagree with de Camp on the rest of his letter.

The huge quantities of reading matter, including *Astounding*, would do little to prevent the backward march of man. Once civilization loses her grip on him, he slips fast and far. The printed page would do little to retard him. Consider: a world-dominating dictatorship with a gigantic "burning of the books." What little that escaped, suppressed as it would be, could hardly be expected to contain enough information to permit future generations to return to the complicated existence we now enjoy. Even without a wholesale destruction of books, it would only take one generation for the greater masses to forget how to read. There would only be a few hermits here and there who knew how to read and had sense enough to use books for other purposes besides starting fires. Another generation or two would suffice for the rest of the population to "liquidate" such queer ones. You know how efficient supposedly civilized and intelligent people like those of Salem for instance, are in matters of that sort. "Cave Man Days, Here We Come" might be an appropriate slogan for the present cockeyed world.

In another letter, Mr. Franklyn Brady attempts to solve MacDonald's intriguing puzzle by technocracy. While I, myself, have no solution, Mr. Brady's plan un-

doubtedly wouldn't work. Successful governments are run by men with a thorough knowledge of the politics involved. Contrary to popular opinion, a good politician is not necessarily dishonest. Just as doctors make poor businessmen, so would scientists make poor politicians.

Since I seem to be in a disagreeing mood, I would like to comment on your recent editorial concerning extra-terrestrial language difficulties. You bring out the point that many words are apt to have a mythological or legendary background. This, of course, is true with many tongues on earth, and there is no reason to suppose it would not be true in the case of any given e-t's language. However, I can't see how that would complicate matters since many people know every little or nothing concerning the derivation of the words they use. They merely employ a certain word or group of words from their vocabulary in order to convey a certain idea. Their choice of words is based on the meanings which they have learned to associate with these words. Thus, they may have no knowledge of the mythological background of such words as "panic" or "nemesis" and yet use them to convey the exacting meanings their derivations imply. As Charles Henry Mackintosh's letters on the matter stated, we think in ideas, not words, and telepathy would transfer thoughts as ideas, not words. However, a difficulty will arise when we run across a race whose thought processes are utterly alien to ours. Remember Weinbaum's "Tweel"? He could make himself understood to the explorer on only the simplest things through the use of one common ground, mathematics. As a sample: to tell that a silicon creature was not intelligent, he said, "You, I one-one two, he no one-one two," (that was verbatim, isn't it remarkable how long good writing stays with you?) meaning you and I reason, but he does not. With anything more complicated both Tweel and explorer were at a loss since their thought processes were entirely different. Telepathy in this case would be useless and dangerous. Sender and receiver are liable to go mad as completely undecipherable thoughts would be bandied back and forth. The unsolvable problem angle you know!

Incidentally, I was astonished to note de Camp's reference to Communists reading *Astounding*. Wouldn't that put them in the same class as the despised intellectuals?

In closing, allow me to cast my vote in favor of *Astounding* books. In particular: "Slan," "Final Blackout"—and say, how



about Heinlein's history? "Lest Darkness Fall"—got such favorable reviews from the *New York Times*, *New Yorker*, and *Time* that I am sure the time is ripe to bring out more of the best-liked *Unknown* and *Astounding* novels. Also, I have noticed in the past six months that Street & Smith has been publishing a series of annuals—football, baseball, detective, and recently love. With the large following s-f has now, it would be entirely practical and profitable to bring out an *Astounding* annual. Could ya', uh, COULD YA'?—Bob Camden, 89 Ridgewood Lane, Glen Oak Acres, Glenview, Illinois.

### Conn-fusion, so to speak?

Dear Mr. Campbell:

I am astounded by the shocking inattention on the part of the readers.

*Tsk. Tsk.*

Because no one else pointed out the little-time tangle in the story by Bester, "The Probable Man," I break my lethargy to try my hand at a letter to the Ed. Said tangle involves the fact that the first Conn of whom we hear is the cause of Hilda's "glad cry" when he returns from the Swast-Reader alternate. That's all very sweet, BUT when *he* left for the S-R alternate *he* also heard the glad cry which couldn't be for *him* since *he* didn't go back to Hilda then—maybe I should say at that time. So who was the cause of the first glad cry which Probable Conn heard? Another probability? If so, there would be two Conns and two Hildas, and maybe more if the second Conn in the yarn decides to come back. He heard a glad cry, too. Incidentally, since both have identical memories, which is really Conn?

That all makes me go on to "By His Bootstraps." In that, none of them had identical memories because they were all at different stages - of the merry-go-round. However, in this I think there is an error; viz: The Wilson which the story follows had already procured all the books and recording when he made good his "escape" from his Diktor, so he didn't need to go through it all again in an attempt to get them when he discovered that he was the Diktor. Or maybe he wanted copies so as to hold his rule, or perhaps just to keep the merry-go-round going around.

At any rate such stories are almost always interesting for mental recreation, since

they admit no answer that is final. The only types which don't have the circle are those in which no back-timing is done.

"Not Final" was final as far as the solution given went, because the effects of the field starting up was supposed to be injurious to life. However, by modifying the trick so that the field doesn't completely die the thing could work.

For the Analytical Laboratory: (1) "The Sea King's Armored Division," Parts 1 and 2; (2) "By His Bootstraps" and "Common Sense"; (3) "Not Final!"; (4) "Manic Perverse"; (5) "Two Percent Inspiration."—Bill Calhoun, 727 Glenwood Road, Glendale, California.

*Wilson The First arrived in the future-world for the first and originating time when "Joe" and Wilson No. 3 got to making wild swings at each other. Remember? He got pitched into the future headfirst. Didn't he? Or did he? Or—*

Dear Mr. Campbell:

No, you don't, chum, no, you don't! I'm like Wilson; I've got to worry about it! Our friend Mac still doesn't get us un-snarled with his causation. The whole thing is still hung up at both ends, and don't tell me there's no end, but only that infernal circle; because we must have the extreme starting point for Wilson's introduction to the time gate, regardless of the painful inability to escape that endless round. Also, we must have at least one Diktor left over for that future. Anson concedes us that one small, comforting item. Which gives us a bit of a continuity. There must be an original. Which came first—!!

How many times has such been beat to death in your columns? Some might say Mac could have made a long novel out of it, but I believe it was much more effective as we received it.

Bob Heinlein scores, as usual, with "Common Sense," and Asimov clicks with another of his "Now let that be a lesson to you," stories.

I see where you are getting requests for Dold. I always did like him, although not too heavily called upon, as he was in the past. Whatever you do, don't use Bok. The man is a menace to science-fiction; let him stay in the fantasy field.

The entire issue was very smooth, with the exception, of course, of Brass Tacks.



But how about more debate?—Thomas R. Daniel, 721 Wisconsin Street, Pomona, California.

*I liked Joe-Jim myself—but he obviously had to die.*

Dear Mr. Campbell:

Exemplary of the trend toward characterization in science-fiction. "Common Sense" brings to a close the tale of Joe-Jim Gregory, a being fit to go down in history with Aarn Munro, Dick Seaton, the Lieutenant, and company. It ranks first—undoubtedly—in the latest issue.

That's one of Heinlein's biggest virtues: characterization. It's been with him since "Life-Line," culminating in Lazarus Long and Joe-Jim. Van Vogt can do it, too. This is the missing factor which caused s-f's slump for such a long time.

You will notice that the old-timers—the real old-timers, of pre-'26—had this little virtue. Ray Cummings, Merritt, Verne, Wells, and on, and on, and on. Now we are getting it again.

Special notice to the loudly lamenting fans—I'm thinking of Moskowitz now—don't worry about the good old days, or try to place them. They're right here, and getting better and better. Period.

BUT—don't slight other points found in "our" literature. A certain one of your competitors sometimes runs masterpieces of characterization which, as stories, stink—to say the least. Give us a balanced diet, minus both old-time "stale story" and fast-action pulp yarn of today.

Now, then, presuming you've stuck with me thus far, I would like to know whether or not you'd tolerate a reiteration of certain praises and remarks on Wesso—you wouldn't? Ah, well, what could I expect? And you wouldn't tolerate a remark in defense of Schachner's "Past, Present, Future," or an attempt to get you to run a satisfactory concluding episode—you wouldn't. Or a plea for a "Legion" serial—

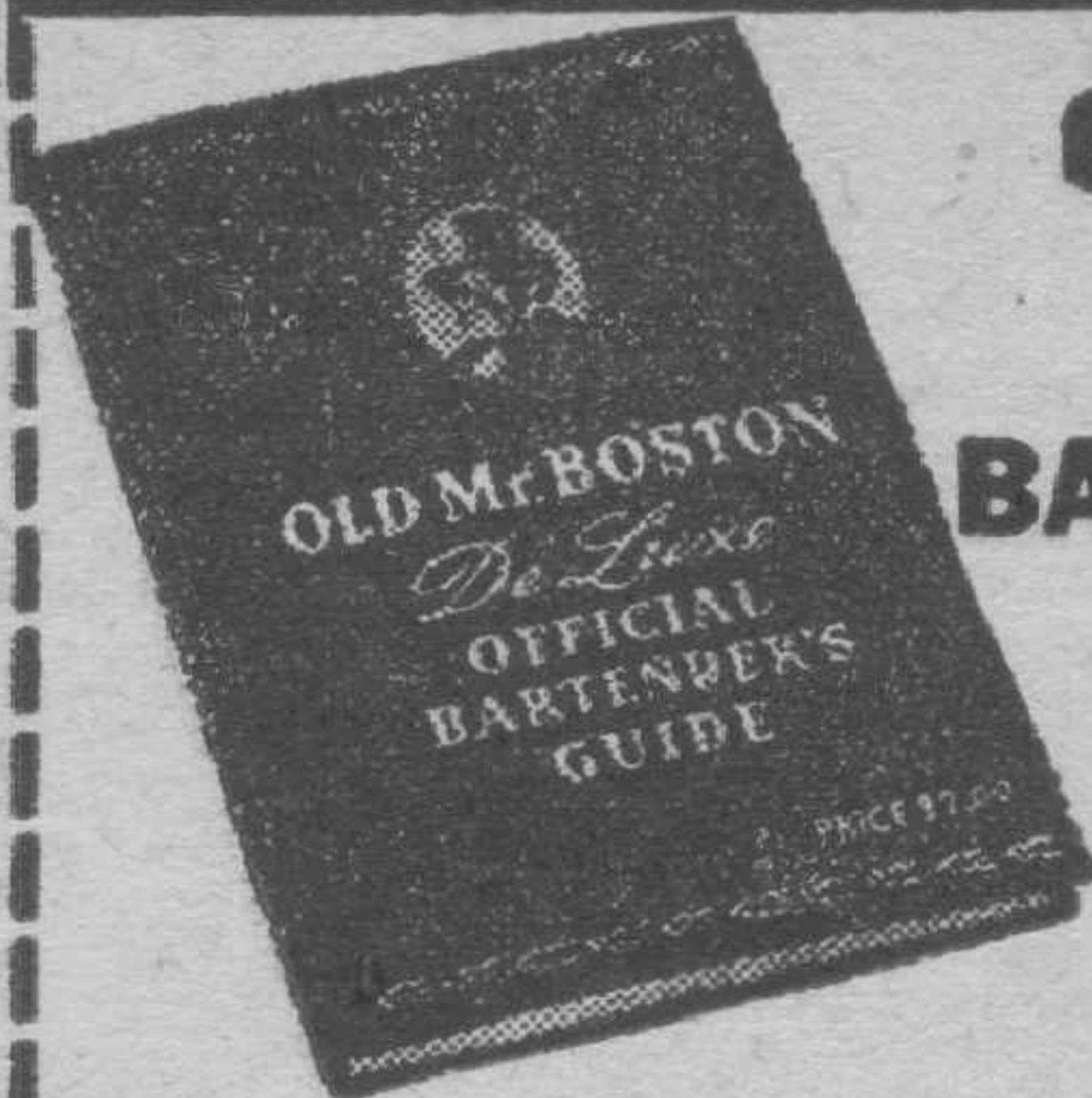
Hm-m-m—maybe the boys aren't so far wrong with their talk of the "good old days." At least we then had Wesso, Schachner, and the Legion!—Paul Carter, 156 S. University Street, Blackfoot, Idaho.

*Johnny Day maintains—*

Dear Mr. Campbell:

I am afraid Robert Kahn, who in the September Brass Tacks column questioned the geometrics of Johnny Day, *did* stick his

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neck out. You see, he made an assumption not in keeping with the facts of the case. Similar rashness has brought other theorists to grief.

For some reason I cannot determine, Mr. Kahn *assumed* the plug outlets to be two feet from ceiling and floor, respectively, on the north and south walls. In the story it is clearly set forth that the triple socket terminated "on the wainscoting," a distance which is, in the average room, *one* foot. Taking our distances from ceiling and floor, then, as being one foot, we find that Johnny Day's solution to the problem requires a cord measuring  $\sqrt{24^2+32^2}$  or 40 feet, and the Kahn solution calls for  $\sqrt{17^2+37^2}$  or 40.7 feet. Incidentally, Johnny's diagrams show a 40-foot solution. Why did Mr. Kahn doubt his honesty?

As for the Mobius strip being a "very near rabbit to pull out of the hat"—Johnny Day thought so, too.—Nels Bond, "Sans Sou," Prospect Hills, Roanoke, Virginia.

*Might he'd write for the Patent Office instead of for Astounding if he had a complete answer?*

Dear Mr. Campbell:

In the hope that some day this letter will reach you, and maybe even get printed, I am going to make a suggestion. I think that the readers of Astounding would like a little explanation of such gadgets as spy rays, which are the mental product of "Skylark" Smith. For instance, he tells how primaries work; an overloading of the secondaries. All QX! But how in Klone do the secondaries work? Also the big tank in the *Directrix*. Suppose there are two stars—whites—almost in line, but one 50 parsecs distant, and the other 300 parsecs. How can you tell how far a ship—red—is from either one of the stars if it's between them?

If Skylark doesn't read Brass Tacks, I wish you would ask him.—Fred J. Melberg, Jr., 3823 Burke Avenue, Seattle, Washington.

