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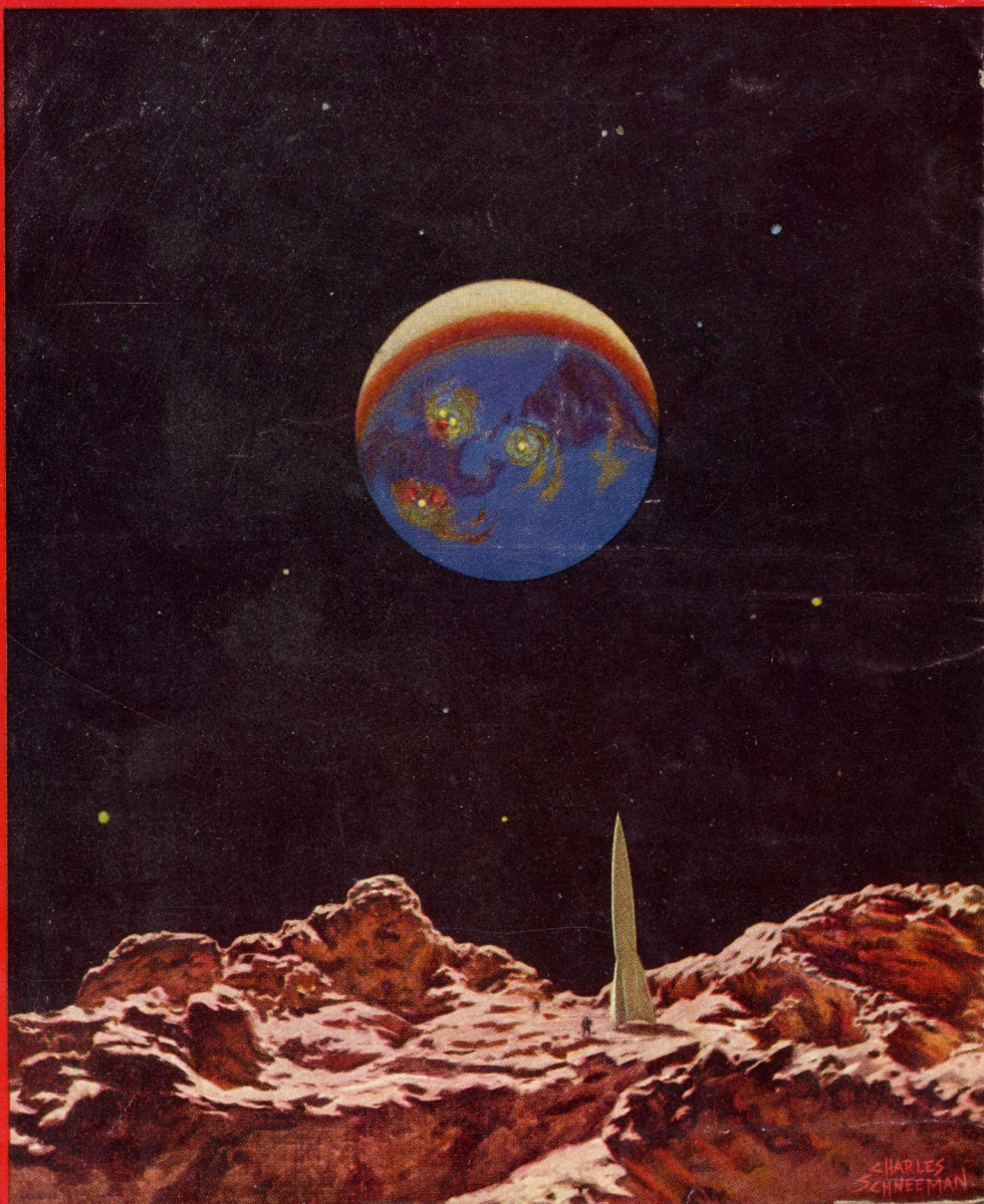

The Last Blast BY ERIC FRANK RUSSELL

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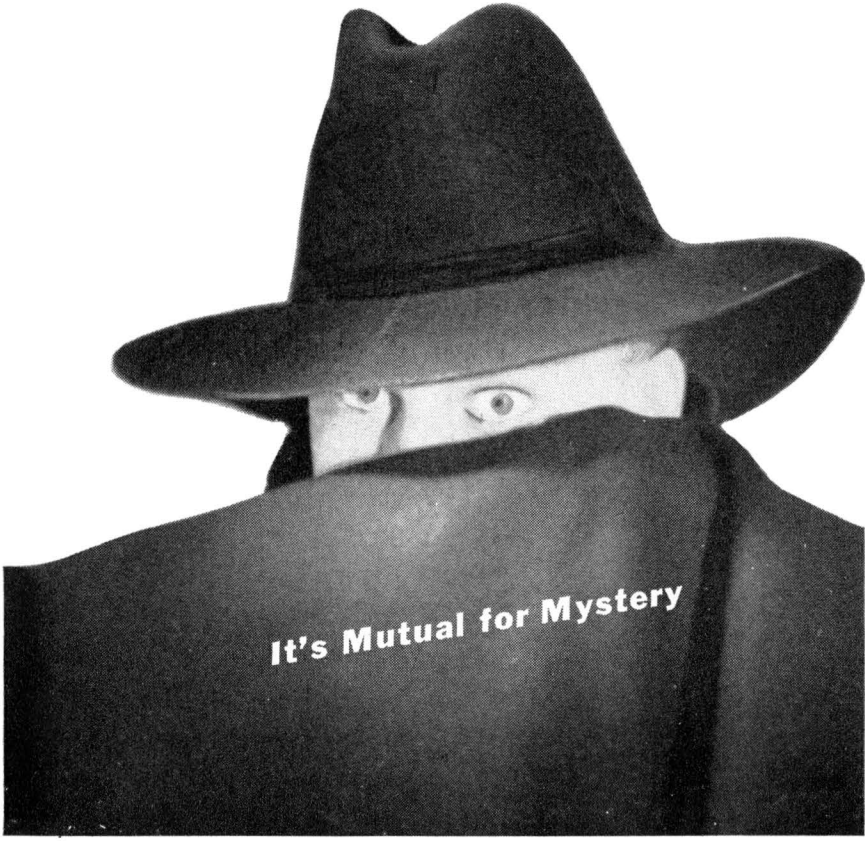

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Astounding
SCIENCE FICTION

NOVEMBER 1952 VOL. L NO. 3

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Astounding SCIENCE FICTION published monthly by Street & Smith Publications, Incorporated at 575 Madison Avenue, New York 22, New York. Gerald H. Smith, President; Ralph R. Whittaker, Jr., Executive Vice President; Arthur P. Lawler, Vice President and Secretary; Thomas H. Kaiser, Treasurer. Copyright, 1952, in U. S. A. and Great Britain by Street & Smith Publications, Inc. Entered as Second Class matter at the Post Office, New York, N. Y. Subscriptions $3.50 for one year and $6.00 for two years in United States and Possessions; $4.50 for one year and $7.75 for two years in Canada; $4.75 for one year and $8.00 for two years in Pan American Union, Philippine Islands and Spain. Elsewhere $5.00 for one year and $8.50 for two years. When possible allow four weeks for change of address. Give old address and new address when notifying us. We cannot accept responsibility for unsolicited manuscripts or art work. Any material submitted must include return postage. All subscriptions should be addressed to Subscription Dept., Street & Smith Publications, Incorporated, 304 East 45th Street, New York 17, New York.

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EDITORIAL

NONLINEAR PHENOMENON

Two plus three equals five, as everybody knows, and does so always, everytime, and everywhere—we were most thoroughly taught. It's perfectly logical, and very useful—but unfortunately it is *not* true that it is a universal fact.

Two plus three equals five at all times within the fairyland of mathematics. But in that same fairyland, straight lines exist, and planes are perfectly flat, light travels in rectilinear fashion, and infinity means something unlimitedly large. King Oberon rules, and all's simple with his world.

We don't live in fairyland, however. If you take a standard slide rule, and add two and three the answer is six. On a logarithmic, nonlinear system, that's what you'd expect, isn't it?

If you took a column of water precisely ten kilometers high, and put it on top of another column of water precisely ten kilometers high, in King Oberon's world it would be twenty kilometers high. But not on Earth. Water is incompressible—within limits. And at twenty kilometers, under Earth's gravity, you've exceeded the limit. Ten plus ten does not equal twenty.

And light does not travel in straight lines—except in empty space. The less empty the space is, the less straight the line of travel of light.

I'd like to make a proposal for your consideration. Proposed: That logic is applicable *only* in fairyland.

I'm not talking about Aristotelian logic, or non-Aristotelian logic, but

any and all forms of straight-line thinking.

The mathematicians have not yet, so far as I know, developed processes for handling complex, nonlinear processes. One of the best examples of the inherent difference between linear and nonlinear processes is the interaction of two different frequencies passing through an electrical circuit. You can send two different frequencies down a perfectly linear circuit, and at the other end there will be found frequencies A and B, and *only* A and B. But if you have a nonlinear circuit, at the other end you will find frequencies A and B, and also A plus B, 2A plus B, 2A minus B, A plus 2B . . . et cetera, ad infinitum.

Purely linear, logical thinking can only add and subtract; it cannot produce the distortions necessary to creative thinking. Machines have been made that can do logic more perfectly than anyone but one of those supremely logical paranoid psychotics. But these perfectly logical machines are perfectly noncreative; they never generate a new idea, a new combination of facts leading to a new understanding.

Suppose that logic applied only in "flat space," or where the intensity of forces was so low as to be practically flat. Like Newton's gravitational formula, which works perfectly if the gravitational field is not too intense. But whenever the intensity of relationships involved passes a very low level, increasing distortion sets in. Whether it be human relationships, or gravitational relationships, linear relationship thinking *does not in fact apply* when the intensity of relationship rises.

If Man does, in fact, match the characteristics of the Universe he is part of —which would seem to be somewhat more probable than otherwise—then Man is *inherently* nonlinear. Then logic, being a straight-thinking, linear process would not be applicable to human relationships. The logician would then say, with intense frustration, "Human beings are not logical—they are irrational!"

He'd be wrong; the correct statement then would be, "Human beings are not linear, they are matched to the reality of the universe, and are rational, but illogical."

A particle moving with a speed of 185,000 miles per second behaves in an illogical manner also. How fast would it be going if it were going twice as fast? In the facts of the real universe, $2 \times 185{,}000 = 186{,}000$—approximately. Is that illogical? Yes—it certainly does not obey the rules of that fairyland mathematics and logic we were taught. Is that equation irrational? No, it is not, unless we decide to call reality itself irrational.

Perhaps human relationships would work out a bit better, too, if we adopted the physical science viewpoint that that which actually happens is real,

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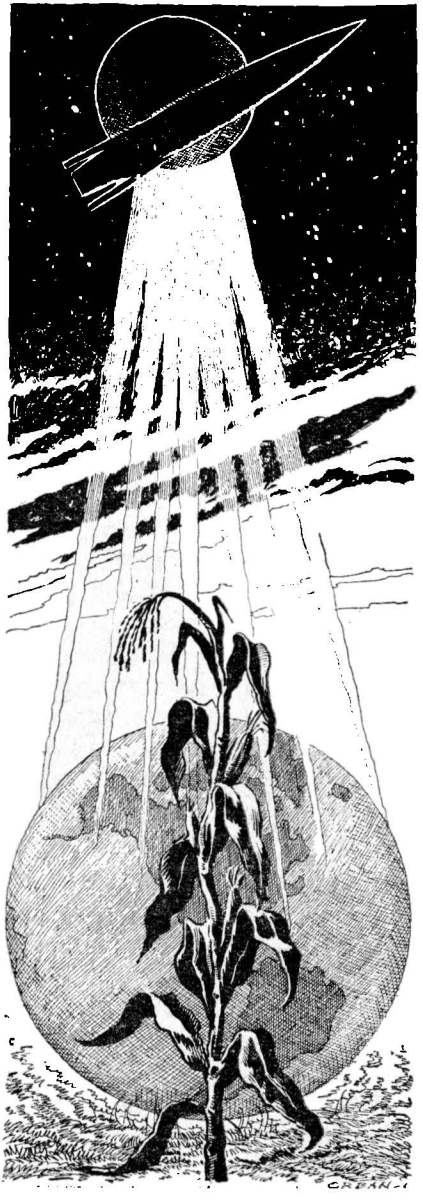


LAST BLAST

BY ERIC FRANK RUSSELL

An object can be stolen fairly successfully, ordinarily—but there is something that seems very easy indeed to steal—and is about as safe as a stolen rattlesnake.

Illustrated by Orban

The blow was delivered in a manner full of logic and devoid of sentiment, that is to say, suddenly and without warning. It was a hundred or a thousand times more fearsome than the latest hell-bomb but took longer to demonstrate the fact. Nobody opposed it or tried to strike back for the plain reason that nobody knew they'd been hit.

And when realization came, it was too late—as had been intended.

A rather appalling simplicity was the outstanding characteristic of the unknown enemy's technique. One long, silvery cigar came out of the sky, dropped seven bombs in planned positions and went away. It wasn't noticed. At minimum altitude of twenty miles and lowest velocity of four thousand eight hundred per hour, the thing remained too high and fast to be discovered by the naked eye. Neither did radar screens register its passing. They were not alerted because in orthodox thought there was nothing for which to watch. The world was at peace, without fear, and had been for more than half a century.

The bombs landed and burst without spectacular brilliance or tremendous noise or detectable concussion. They looked as formidable as so many bottles of stale beer tossed overboard by an irresponsible spacehand for they were nothing but small, brittle spheres containing a thin, slightly cloudy liquid. The spheres hit Earth and shattered. The liquid splashed around.

This spread of droplets was the beginning of the end, creating the certitude that humankind would pass out not with a bang but with a whimper. The greatest scoop in history for any journalist able to see the shape of things to come. But no newspaper mentioned it the next day. No radio network voiced one excited word about it. They didn't know. They didn't suspect. They had been killed—but needed time to die.

Humanity remained untroubled for at least a little while when every second counted and every split-second added long steps to the march of death. Some folk worried but it was about health, babies, taxes, stocks and shares; other folk, hopes of heavenly salvation, anything but poison from the skies.

The first to gripe was Barton Maguire, a farmer in Iowa. The last to react were the seven human beings on the Moon. Maguire's surly complaints served as the original warning. One of the Lunar seven made the final move.

Men on the Moon were no novelty. Twenty successive landings had boiled away a world's capacity for amazement. A feat is remarkable only the first time. Do it again and it reduces to pretty good. Twenty times becomes ordinary.

Only a ship on Venus or Mars would bring a repeat of those wild inter-

national celebrations of sixteen years ago. Such another whoopee had yet to come and by the looks of things there would be a long wait. Thirty million miles come to more than a hop, skip and jump.

Meanwhile men had to be content with a satellite as their sole cosmic plaything. The group on the Moon were there because the playing had begun. Their task was not complicated, not immensely difficult, but it was valuable as a source of essential data. They were extracting a sample of the new toy.

To this purpose they had considerable tonnage of equipment ferried over in four loads. Within an air-tight sanctuary, shaped like an inverted ice-cream cone, they worked upon a minor crater that had no name, tended a nuclear engine and serviced a drill that brought up a constant succession of cores each of which told a story. An expert could cast a sharp eye over these cylinders of extra-terrestrial plasma and declare that to the limit of the bore the Moon was made thus and so. Later, analysts would use them to list its riches in hydrocarbonates and metallic ores, if any.

Seven men consorting cheek by jowl under a dunce's cap and parted from the rest of humanity by a quarter million miles. There were moments when it irked; times when the engine moaned and the drill churned and the great rig trembled to its peak far beyond allotted hours—because men must battle the immediate task lest instead they battle each other.

Wilkin, government metallurgist, was the least sociable of the bunch. A gaunt, elderly individual with pale eyes fronted by steel-rimmed glasses, he had the dreary pessimism of the liverish and nursed the resentment of one handed a young man's job when near retirement. Somewhere back in the stuffy haunts of bureaucracy his tongue had stabbed a superior. The Moon was his sentence.

Liveliest of the lot was Yarbridge, thickset, tow-haired—the radio operator; a one-time ham who gloried in running a station where none had been run before. The small but powerful transmitter-receiver was his personal juju complete with call-name of *Yarboo*. He had an advantage over the rest—he had the comfort of his god and a thousand invisible friends behind the god. He had been conditioned to the company of voices in the dark. About the only thing he missed was the morning mail with its QSL cards.

The busiest and, therefore, the least touchy man was James Holland, tall, gangling, freckled. Though the youngest member of the party he was quiet, thoughtful, studious. He had to be. As the atomechanic he'd spent four years studying nuclear engines and reckoned he'd devote another forty to absorbing latest advances.

Some fast brainwork had been

required to learn how to cope with the contraption he'd got here, for it was way ahead of anything he'd seen at the International Power Institute—one quarter the size, one eighth the mass, and it ran on thorium. It resembled a pair of Diesels coupled nose to nose with the hot-stuff cased between the fan-drives. Probably it would be out of date within a year. Holland tended to pore over books and blueprints in determination to keep up with the times.

The remaining quartet were curiously alike in many respects, big-chested, hard-eyed, untidy, ruthlessly expert at various card games and lavishly supplied with adjectives. All four had made a career from sticking pins in Earth's heart for the big oil companies. They knew how to do it and did it well, vituperatively but efficiently.

The day the bombs dropped there were forty-six cores lying outside the Moon-dome. They reposed in a neat row, placed in order of extraction, each tagged at both ends with a plastic numeral by way of double check. The quantity of them indicated a bore-depth of nine hundred twenty feet. The nuclear engine moaned soft and low while the drill rotated and sank slowly, ever so slowly, toward the thousand mark.

An untouched case of whisky atop a small mountain of sealed food patiently bided this first celebration-point. At one thousand feet a bottle would be broached, some sort of petty celebration organized. There were twelve bottles in the case but that didn't mean a probing limit of twelve thousand feet. The drive would continue so long as the engine could rotate the lengthening mass of steel tube, so long as a ship could bring more shafts, more cutting-heads, more whisky.

Ambling to the dome's center point, Yarbridge eyed a white ring where the turning shaft had been touched with chalk at a measured point. He kept quiet while a driller timed the ring's descent to ground level. The chalk circle disappeared and the other put his watch away.

"How's she going?" asked Yarbridge, not really caring.

"Cool and steady." The driller bit a ragged end from a thumbnail. "What's the latest from over there?"

"Gale warning in the Atlantic. Vesuvius is spewing skyhigh and the Italians are evacuating the area around it. A Czech stratoliner has crashed. Seventy dead, no survivors. They were burned alive."

"Humph! Nothing ever happens." He put spit on a finger, used it to make a wet ring on the shaft. "Luck!"

"What's that for? Hoping to hit a gold reef?"

"Hoping we don't have to change a cutter too soon."

Yarbridge nodded. He could see what it meant. Real sweat. They'd

have to haul up most of a thousand feet of stuff, detach it section by section to get at the worn head. Then fix a new cutter and reverse the whole process, linking up section by section as the toothy bit went down. It would have to be done again and again and again but nobody was yearning for it.

In short time he tired of studying the shaft and started what they had come to call the Sing Sing hitch, namely, a bored, aimless walk to and fro or around the rim of the circular space in which they were confined. Day and night some fidgety soul was performing this trek. When two did it simultaneously and passed each other for the tenth time, each generated mild thoughts of mayhem.

He wouldn't have been mooching but for the home planet's Asiatic face. The great hemispherical antenna atop the dome did not trap much worth having when confronted by Chinese, Malays and Dyaks. Caterwaulings from Shanghai, tin prices from Singapore and a little boogie from Tokyo. The thousand with the kit to beam him were concentrated around the corner and temporarily silent. These were the siesta hours of his electronic god.

Finally he sat on a packing case near the engine, watched Holland check over the linked generator that provided heat, power and light. It struck him as faintly ironic that they could and did use electric razors while millions on Earth lacked the juice to run them.

"James," he said, "why am I like the Moon?"

Holland turned a freckled face toward him. "Don't you know?"

"Perhaps," said Yarbridge, "it's because I'm bored." He brooded a moment, asked, "Aren't you?"

"No."

"Why not?"

The other thought a while, said slowly, "Like you, I have an interest. But mine doesn't wax and wane with exterior conditions. It remains constant."

"I guess you're right. Maybe I've become too dependent upon a box of tricks. I should have learned to play poker."

"Fat lot of money you'd have coming at the end of this," opined Holland. "Those four would have stripped you."

"Or I might get their wads."

"I doubt it."

"Yes, and so do they judging by the number of times they've wanted me to join them." He glanced around. "Where's old Sourpuss? Hiding in a crate?"

Nodding toward the trap in the dome's wall, Holland informed, "Put on a headpiece and went out for another look at the last core. He muttered something about that inch-wide striation of red dirt being ferrous oxide."

"What does that signify?"

"Nothing of importance. It isn't worth digging up. Too thin and too deep."

"The truth is that he doesn't give a darn for that core or any other," suggested Yarbridge. "He's escaping six faces that give him the gripes. A two hours' supply of oxygen means that temporarily he can get away from it all. Why doesn't he join the Foreign Legion?"

"He's an old dog compelled to learn new tricks," said Holland solemnly. "As a young one in the same fix, I sympathize with him."

"They ought to let him go home," Yarbridge commented. "They ought to send us a guitar player in his place. Or, better still, half a dozen slinky brunettes from the chorus line. Rumor has it there are twenty more points selected for further test bores. If so, we'll be stuck here quite a spell."

"Suits me. I'm out of mischief, perfecting my education and making money fast." He gave a sly grin. "Being neither married nor brunette-starved, I can afford to wait."

Yarbridge stood up, stretched himself, made a face. "Oh, well, shortly the sunny side."

The other knew what he meant. They were swinging away from Earth's dark hemisphere and round to her illuminated face. That meant an additional diversion in circumstances where each one was precious, to be savored to the utmost. Some intelligent official back home had seen fit to include in their equipment a small telescope, only x200, with four-inch object lens. It had proved considerably a morale-booster. Men could and did stare through it for hours, drinking the scene with avid thirst, and telling each other thumping lies about the wealth of detail to be discerned in their own back yards.

They cleaned, polished and fondled the spyglass, treating it with loving care, for it made the faraway seem near. It provided illusionary comfort. Soon it would reverse that role and create realistic pain. It sharpened any eye in search of peace and beauty—but magnified turmoil and tragedy with equal impartiality.

A direct pointer to coming trouble was not immediately recognized as such either by the seven on the Moon or the teeming masses of Earth. Even specialized minds summoned to deal with it were motivated more by curiosity than alarm. It formed a minor item in a news bulletin picked up from KDTH at Dubuque, Iowa.

"Experts from the Department of Agriculture at Washington are flying to the farm of Barton Maguire, near Dubuque. In an interview Maguire said that a field has developed grass-rot."

It was forgotten before the succeeding item had been voiced halfway through. KDTH began to fade. Yarbridge searched around, picked up a

lively performance of "*La Cumparsita*" from Rio de Janeiro, hummed in off-key accompaniment. Wilkin lay nearby on his oxygen-inflated mattress and frowned through his spectacles. Two drillers off duty played cards with deadly earnestness.

Two days later WCBM at Baltimore, made intermittent by static, let go half a sentence. ". . . Eminent botanists and biologists rushed by the United Nations Food Commission to the farm of Barton Maguire, in Iowa."

James Holland, having a turn at the telescope, removed his attention, said to nobody in particular, "Who's this Maguire? I'm sure I've heard his name before."

"There are millions of them," grunted a driller. He planted a queen on his opponent's nine, confiscated both cards. "They swarm out of the ground every St. Patrick's Day."

Letting it pass, Holland had another look at Earth. In full sunlight it was a spectacle of which one could never tire, a vision infinitely more satisfying than the other planets or the host of stars. And it kept steady, without faltering behind a shivering atmosphere. The chief snag was that if one stared too intently and too long one began to imagine things. The brain gained ascendancy over the eyes, forcing them to detect a nonexistent dot in mid-Atlantic and call it a liner. Or convert a line to a road and conjure vehicles along it.

He was again at the 'scope next day when Yarbridge brought in a voice that for some time had been dimly muttering, "Yarboo! Come in Yarboo!" It boosted to fair strength. For a couple of minutes Yarbridge and the other slapped backs, chewed technicalities, exchanged love to Margaret for love to Jeannie, swapped a couple of corny insults. Then again Holland's attention was drawn away as the distant ham spoke more seriously and in lower tones.

"Something fishy is going on. Lot of rumors flying around. They say that troops have been rushed north with flame throwers. A guy told me he'd been turned back by the National Guard outside Dubuque. He thinks a flying saucer has landed and the authorities are keeping it quiet. You can take that as bunk. How many saucers have you found up there?"

"None," said Yarbridge.

"It's bound to happen some day," ventured the other. "But I don't believe it's happened yet. This saucer stuff is a lot of scuttlebutt. All the same, there's a general feeling of suspicion that something is going on and we're not being told. See if you can raise a station farther north—maybe you'll be given a hair-raiser."

"You could do that yourself." Digging a small book out of a breast pocket, Yarbridge consulted it. "There are a dozen or more in and around Dubuque."

"Hah! You're telling me? Their

cards are stuck on my wall. Try getting them!"

"You mean they're not operating?"

"Definitely not!" A pause, then, "That's why I say there's something peculiar afoot. If anything of national or international interest were taking place up there, they'd be bawling all over the bands. But they aren't. You know what *that* means!"

"Shut down and sealed by official order."

"That's how it looks—and I don't like it."

"Me neither." Yarbridge glanced at an Earth-chronometer ticking to one side of his rig. "Will you be around at eighteen hours G.M.T.?"

"Yes, if I'm not in clink."

"All right. I'll let you know what I find."

He added a bit more, switched off, turned in his swivel seat and said to Holland, "I've known that boy for ten years. He's as excitable as a porcelain Buddha and doesn't tell tales for the fun of it. Furthermore, all the hams in Dubuque won't drop dead on the same day."

A hairy driller passing by caught the last remark, stopped and informed, "They might, if they were holding a weekly meeting and some nut let go a bomb. Years ago we lost a complete crew that way during a native revolt."

Ignoring it, Yarbridge went on, "Can you see anything extraordinary in Iowa?"

"What, with this glass?" Holland made a disparaging gesture. "We need one umpteen times the size."

"I suppose so." He switched on, resumed probing the ether. "If we can't use our eyes, we'll have to depend on our ears. I'll try bringing in Jerry, who lives at—"

He broke off as his slow-motion dial hit a peaky point and a Canadian voice came out the speaker: ". . . At Ottawa this morning. After a hurried meal the Russian delegation left by air for Iowa, having refused press interviews. Circles close to the United States Government say that an exchange of agricultural technologists has been arranged and that an American party flew to Omsk last night."

Holland got up from the 'scope, put hands on lean hips and said, "That's Iowa again."

"I know." Yarbridge sounded a little grim. "How about adding another heater or two? I feel cold."

"You'll be colder if major ructions take place across there," remarked Wilkin, morbidly gratified. "Fine fix we'll be in, cut off from the rest."

"Why should there be trouble?" asked Yarbridge with a touch of defiance. "We have outgrown world wars. There hasn't been so much as a diplomatic clash for half a century. Everyone is peaceful and happy these days."

"Are they?" Wilkin cocked a sardonic eyebrow.

"They darned well ought to be!"

"*Ought* and *is* are different words," Wilkin pointed out.

"You should know!" snapped Yarbridge.

"What do you mean by that?" His pale eyes narrowing behind his glasses, Wilkin sat up.

Hurriedly Holland chipped in. "If people had the patience to wait for the heaters, there'd be no need to warm up their tempers." He started off toward the switchboard, adding, "I can take a hint. I'll turn them on at once. No rest for the wicked."

It served to crack up the acrimonious byplay. It was a conversational gambit frequently adopted by a third party when two men showed signs of rubbing each other the wrong way. Strange conditions breed strange conventions, including that of drowning other people's differences in one's own sorrows.

Here, the problem of how to live together perforce had been solved, haphazardly but adequately. On Earth it was soon to prove unsolvable. The unknown enemy had complicated it beyond solution merely by shifting its crux from the brain to the belly.

Possession of power creates a peculiar hiatus in the reasoning part of the brain. There's one lesson that authority is mentally incapable of learning, namely, that truth will out. The more determinedly and persistently truth is thrust down the well, the bigger the bounce when finally she emerges.

By the end of a week authority still wore a pin on its lips but the Lunar seven had learned via Yarbridge and a hundred hams that Iowa was under martial law and its state lines held by troops against all but those holding official permits to cross. Also that the German and Brazilian armies had been partially mobilized with the consent of the United Nations. The Australian Government had voted itself powers unheard-of except in time of war. Planes and unspecified supplies were being rushed to south China for reasons not stated.

Two more days and the stubborn secrecy of the powers-that-be was bust wide open by the sheer necessity of world-wide publicity. This point marked the second step forward in the natural march of events foreseen by those who had provided the root cause.

Yarbridge could have picked up the official announcement from any professional radio station in any known language. By luck he got it from WBAX at Wilkes-Barre.

"A previously unknown phenomenon afflicting the holding of Farmer Barton Maguire, outside Dubuque, Iowa, has been found by experts to be caused by the presence of a filterable virus that is responsible for the ultra-rapid decomposition of chlorophyll. The same virus has also appeared in Brazil, Germany, mid-Russia, China,

Pakistan and Rhodesia. Its origin is unknown."

"Well, that's a consolation," commented Yarbridge as the faraway announcer paused for breath. "I'd expected something worse."

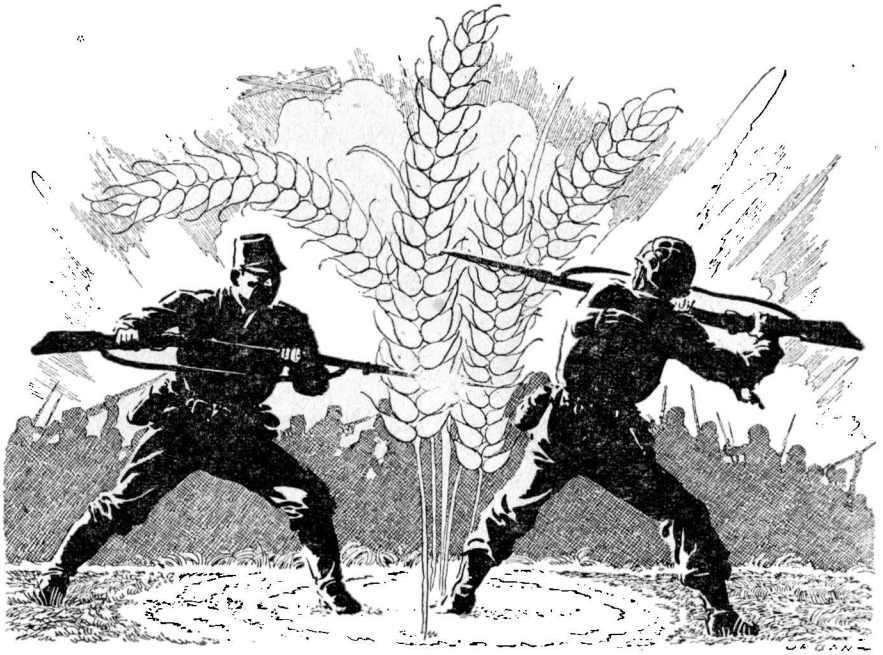
"You couldn't!" contradicted Wilkin.

WBAX continued with: "This disease can be spread by contact and borne from one place to another by animals or birds. The government, therefore, prohibits all movements of livestock whether near an affected area or not. Dogs, cats and other domestic creatures must be kept under control. Any found wandering loose will be destroyed on sight without compensation to owners."

"They're becoming tough," observed a driller, thoughtfully. "It can't be for nothing—the public wouldn't stand for it." He pulled at an ear, finished, "I reckon it's serious."

"Shut up and listen," ordered Yarbridge.

"Under the Emergency Powers Act of 1988 the government takes authority to seize any property found to be contaminated and use thereon any measures that may be deemed necessary to destroy the virus. All citizens are required to report affected



areas without delay to the nearest post office, police station or military camp. Failure to do so is punishable by a fine of one thousand U.N. dollars or one year's imprisonment."

"Hell's bells!" the driller ejaculated. "Sounds like they're scared."

"*Sh-h-hl*"

"The following description of symptoms has been issued for the benefit of the public," went on WBAX. "First occurs a bleaching of green leaves which turn gray and dry within forty-eight hours. They are then brittle and lifeless, will readily crumble between the fingers. The process spreads from point of origin in a rapidly increasing circle, destroying plant life over a progressively greater area. The inside of such an area is not dangerous since the virus remains active only at the rim where it can continue to feed on chlorophyll. The rim, therefore, is the danger point; pending arrival of expert assistance the rim should be thoroughly burned by any means at hand and then given similar treatment at any point where advance is found to continue. The Department of Agriculture assures listeners that there is no reason for undue apprehension and that every effort is being made to find a satisfactory method of combating this menace."

Wilkin wiped his glasses and said, "That last lullaby tells two things. One, that they regard it as a genuine menace. Two, that they haven't found what they call a satisfactory method of dealing with it."

"They will," assured Yarbridge.

"Will they?" asked Wilkin.

"You like to think they won't, eh?" inquired the driller, glowering at him.

"I see things as they are and not as I'd prefer to see them," answered Wilkin, stiffly. "My dream world has long been dead."

"The real one is alive. It will go on living."

"The former is factual; the latter hypothetical."

The other let his fists dangle. "When a guy turns to ten-dollar words, I give up."

He went away, sadly shaking his head in the manner of one unable to cope with an idiot. Wilkin finished shining his glasses, carefully fitted them on his nose, eyed Holland as if inviting further comment.

Holland obliged with, "One thing they didn't tell us."

"What's that?"

"Rate of spread."

"Yes," agreed Wilkin. He fiddled his fingers, watched himself doing it. "They didn't tell us."

"Maybe they forgot," offered Yarbridge. "Or didn't think it especially important."

"It could be five inches a month," ventured Holland. "It could be twenty miles per day."

"Now don't start giving me the willies," Yarbridge protested.

"If you want a real headache," suggested Wilkin, "go to bed and think it over. Take away chlorophyll and see what's left."

"It means nothing to me. I don't eat the lousy stuff."

"You're lucky," said Wilkin in the same even tone. "You should survive as the last man."

Yarbridge scowled, said to Holland, "What is he talking about?"

"Something that may never happen."

"I might have guessed it." He sniffed his contempt.

"Or may," said Wilkin.

"There are the oceans," Holland told him, "full of fish."

"How nice!" said Wilkin. He lay down, closed his eyes.

Confused with having half his attention on the radio and only half on this erratic conversation, Yarbridge demanded, "Look here, what has fish got to do with it? Why bring them up?"

Wilkin did not bother to reply.

Holland said, "Oh, forget it," and strolled toward his engine.

"This can't go on for another couple of years," informed Yarbridge, speaking to thin air. "Not when guys go off the beam after four months."

He reached for his microphone, called a person named Jerry without enthusiasm—and without result.

At the thousand-foot mark the barber shop quartet didn't sound so hot and the whisky lacked zip. The celebration had all the joyous verve of a wake held around a frowning corpse. For one thing, they'd been delayed by need to replace a cutter. For another, there were those shenanigans next door, a quarter million miles away.

So they finished the bottle, listened while four cold sober drillers bellowed a bawdy song, put on one or two artificial grins, told one or two unfunny anecdotes. Then somehow they broke it up before properly begun, returned in silence to duty or to bed.

Men were quiet after that, speaking when necessary, tending to hang around the radio receiver or play with the 'scope. Faces became set. The nuclear engine gave out its low whine; the drill went round and round, was drawn up, forced down, rotated again. More cores were stacked outside without anyone knowing or caring whether they held dirt or diamonds. The task had been reduced to a job and the job to a mere function.

As the days drifted by the radio told that the British, Dutch and Belgian governments had brought in a complicated system of food rationing. The United States authorities took control of all cereals and fixed the retail price of bread. Canada followed suit. In the Argentine a million men slaved to build along the northern frontier something described as the Fire Curtain. The Ukrainian Republic

made heated protest to the United Nations about what it called infringement of rights of sovereignty, but nothing was said about what had raised Ukrainian bile.

Obviously a thin, bedraggled veil of censorship continued to obscure the international scene. The dunkers of truth were still on the job. But Moon-listeners found significance in the occasional use of new words apparently coined on the spur of the moment and thrust into news bulletins.

"A gun battle took place in Milan early this morning when strong forces of Italian police surrounded a warehouse and trapped a band of chow-jackers. Eighteen were killed, more than forty captured. The police lost six."

New York state troopers grabbed a bunch of beefleggers. The British sent to jail a smooth gentleman described as a burp-baron. Not to be outdone, the Germans raided a noisy plant in the Black Forest wherein large humans and large canines were cooperating in the production of dog-burgers.

"Hear that?" exclaimed Yarbridge. "How do guys like those get away with it?"

"They didn't," someone pointed out.

"What I mean is where's the money in it?"

"At the right time, in the right place and in the right conditions there is money in dead rats," Wilkin opined.

"If I remember correctly," put in Holland, seriously, "they actually did eat rats during the seige of Paris."

"Go easy, will you?" Yarbridge thinned his lips. "My stomach can stand only so much."

"Be thankful that you're not in the part of Asia where they have two or three thousands to the square mile," advised Wilkin. "You would stand for something a good deal worse there. Or better, according to your gastronomic viewpoint."

"Such as what?"

"Stiffburgers."

"*What?*"

"Mock-pork—the dead feeding the living."

Yarbridge yellowed around the jawline. An off-duty driller—apparently asleep—opened a dark eye and stared at Wilkin. He maintained the gaze while he mulled things over, then rolled off his mattress, lumbered across and spoke in a deep rumble.

"I've had too much of you, you four-eyed runt!" He jerked a thumb skyward. "I've a wife and three kids over there. I've worry enough without you trying to be funny. Keep your noisy trap shut, see?"

"I wasn't trying to be funny," Wilkin denied. He wiped his glasses, peered at the big bulk without visible intimidation. "My only daughter is in Iowa."

"More shame to you then, acting the way you do. Hold your teeth to-

gether if you want to keep them."

Another driller came along, glanced from one to another, said, "Something wrong, Hank?"

"Nothing much, Joe. Only that I'm working myself up to break a certain gab's neck."

"What'll that buy you?"

"Satisfaction," informed Hank.

James Holland said soothingly, "Not all folk worry the same way. Some nurse it; some let it go bang; some hope for the best; some expect the worst."

"All right," conceded Hank. "Then he can switch fast from type four to type one."

"Thus shaping myself in your image," said Wilkin. Displaying unexpected nerve, he came to his feet, faced the other. "Why should I?"

"Because, Granpop, I've got this." His opponent showed a knobby fist half the size of a ham. "And I'm not particular about—"

Wilkin opened a hand, revealed a vest-pocket automatic three inches long. "I've got this—and I'm not finicky either." He waited a moment, his pale eyes level, then ended, "We've free speech here. You're not taking it away. Beat it, you hairy bum!"

The other studied him calculatingly, up and down, then spat on the ground, turned and headed for the mid-section. Joe went with him. Wilkin reposed on his oxygen bag.

"You blundered there," Holland told him. "He's bothered about his family, as is natural. Some people are touchy when worried."

"So am I," said Wilkin.

"You look it," scoffed Yarbridge. "In my opinion—"

He shut up as Holland nudged him. The latter continued, "Anyway, this is no place to wave a gun around."

"It will be!" Wilkin promised.

The third inevitable step began when the Indian delegate to the United Nations Assembly made a long, impassioned speech that might have been cribbed from the late nineteen thirties. It was upon the same subject: the haves and have-nots. It ended the same way—with an implied threat. It produced the same reaction: open pacification and secret preparation.

Dr. Francisca, chairman of the assembly, dexterously employed a procedural quibble to avoid a vote on the plain issue of who should give what to whom. He had a wary eye on the have-nots, present in full strength and ready to vote as one man. The danger of a complete split was avoided for twenty-four hours. At the end of that time India withdrew from the United Nations. China followed. So did every other nation whose crops could not keep pace with its needs.

Joe saw the first flash on Earth's dark side. The little telescope wasn't popular when Earth resembled a great black ball against a blinding

Sun, but occasionally it was used as the terminator approached. He was staring through it in the angled blaze of false twilight when he spotted a flash on Earth's sickle of darkness. Then another and another.

Quietly he left the 'scope, shook Yarbridge awake and whispered, "I've just seen lights over there."

"What of it? Why spoil my sleep?"

"Nobody's seen them before."

"Maybe they weren't looking. There isn't a constant watch as you know quite well."

"I've got a queer feeling about them. They were mighty big flashes."

Yarbridge emitted an imitation snore.

Nearby, Holland stirred, awoke, propped himself on an elbow, asked, "What's the matter now?"

"I don't know," said Joe. "I can't be sure. I want this tramp to check up on the radio."

"Well, what makes you think something may be wrong?"

"I've just seen three great glares on Earth's dark strip."

"Meteors," suggested Holland.

"Do you think so?"

"Could be." He eyed the other. "What else?"

"Atom bombs," said Joe.

"Nuts!"

"Why not?"

"They aren't *that* crazy."

"How can we tell?" Joe asked. "We know only what we hear. And that isn't enough."

"You're morbid."

"Maybe I am," said Joe, doggedly, "but I saw what I saw. Aren't you interested?"

"No."

The other frowned. "Why not?"

"Because I've swallowed a pill that you've yet to take. You'll have to gulp it down sooner or later and whether you like it or not."

"Meaning—?"

"There's nothing we can do. Positively nothing!"

Musing it with much reluctance, Joe finally admitted, "Yes, that's it. Until the ship comes we're trapped. We've got to sit here and watch. We've got to eat our fingers down to the knuckles and—"

Raising an irritated face from where he was lying, Wilkin harshed, "Then go gnaw them some place else. I need sleep even if you don't."

"Earth's dying," said Joe, taking no notice. "The drills are still and the derricks are down and the fields are aflame—and none of you care. Technicians! Bigbrains! And none of you care!"

"Get some shuteye, Joe," advised Holland. "A few sparks in a glass don't signify the crack of doom."

"All right." Resignedly he turned to leave, added with strange positiveness, "But we'll have that sleepy-eyed lunk at his bawl-box before breakfast —and we'll see who's right and who's wrong."

Yarbridge responded with another

snore, a real one this time.

Reclining full length, James Holland stared at the stars visible through the transparency of the dome's conical cap. A blue one kept winking at him alongside the circular rim of the overhead antenna. After a while he closed his eyes but found it impossible to sleep. His brain droned drearily, "There's nothing we can do, nothing we can do."

In the small hours he ceased to court slumber, rolled off his mattress, crept silently past the others' feet and had a long look through the telescope.

There was a babble of insistent voices right across the ether, singsong ones, guttural ones, determined ones, hysterical ones. Ignoring the play of languages none could understand, Yarbridge felt around with his dials, picked up a station that did not identify itself with any call-sign or locale but was rapidly transmitting a series of figures in plain English.

It went on, "The first group of numbers will report for service by six o'clock this evening, the second group tomorrow, the third the day after. Unless he is totally blind or is certified under the Mental Deficiency Act, the failure of any citizen to report will result in the issue of a warrant for his arrest. This is the Federal Broadcasting Service radiating simultaneously from all stations."

"By hokey!" said Yarbridge. "Sounds like they've taken over the whole shebang from coast to—"

He broke off as the faraway voice continued, "Indian and Chinese forces crossed their borders in great strength at noon yesterday and are attempting to seize the Burmese rice-bowl and such wheat-growing areas of central Russia as the virus has not yet reached. A report that Germany is about to invade the Black Earth region of the Ukraine has been energetically denied in Berlin. The Italians indignantly repudiate a French accusation that they are preparing to attack the uncontaminated agricultural area of southeast France. In view of the serious international situation the President has declared a state of emergency and assumed all the powers to which he is entitled thereunder. His midnight speech emphasized that the time has come to honor our—"

The announcer ceased in midsentence. They waited a minute for him to resume but he didn't. Even the sizzle of background noise had gone.

Yarbridge turned a strained face over one shoulder, remarked to the small audience, "That's war—without saying so."

"I could have told you several hours ago," said Joe.

"I'd have bet on it a couple of weeks ago," capped Wilkin.

"How long is it since that virus stuff was first mentioned?" a driller inquired.

Consulting his logbook, Yarbridge informed, "Forty-seven days."

"And how long before the ship is due?"

"Thirty-two."

"Think it'll come?"

It was a shocking question.

Yarbridge passed a hand through tousled hair and growled, "Why not?"

"The ship isn't one of those thinking machines they have in stories," the other pointed out. "Men order it to be sent and other men bring it."

"Well?"

"Suppose they become too busy?"

"That's hardly—"

"Or the ship gets busted wide open?"

"There are two ships," Yarbridge reminded.

"So what? There's a war on. They're parked side by side, like stiffs in a morgue. Whatever wallops one will wallop both."

"The walloping won't be easy," put in Holland. "They've got formidable defenses over there."

"What, after fifty years of peace? They never had enough even when they were having wars."

Joe chipped in with, "How about asking the spaceport to confirm date of arrival?"

Glooming at his instruments, Yarbridge said nothing.

"What's come over you?" persisted Joe. Suspicion grew into his beefy features. "You're here to maintain contact, aren't you? How about raising the spaceport?"

"I can try," said Yarbridge.

"Try? What d'you mean, try?" Joe glanced around at the listeners, added, "How long since you last spoke to the spaceport?"

"Nine days."

"Haven't you called since then?"

"Dozens of times. No reply."

"No reply," echoed Joe. He swallowed hard, stared at his feet, manifestly could think of nothing more to say.

Wilkin studied him with pale, calculating eyes.

"And you didn't tell us," broke in another driller, with unconcealed ire. "These fancy mechanics knew we're cut off but didn't tell us. We're too dim to understand. We're only oil boys, see?"

Holland said, "Now don't start dividing us into rival trade unions just because four of you happen to share the same skill. We're all in this together. The spaceport has something better to do than chat and hold our hands day after day. We've gone many a full week without speaking to it."

"Not when it's being called," retorted the other.

"Radio apparatus isn't infallible," said Yarbridge, not very convincingly. "They may have a technical hitch."

"I always thought you guys were too clever to have hitches."

"I wish to heaven we were!" said

Holland, fervently. He rubbed a freckled chin, glanced toward the engine steadily droning on the farther side.

The others followed his gaze and went silent. They knew what he meant. The engine and its coupled generator provided light and they could dispense with that if necessary. Also power for the drill, the radio, the cooker and other items they could do without in a pinch. Also warmth via the numerous heaters placed equidistantly around the perimeter. They couldn't live through the Lunar nights without warmth. And finally oxygen by electrolysis of Moon-water eighty feet down. They couldn't survive without oxygen.

Frankly alarmed, one asked, "How much jollop have you got for that contraption?"

"You mean thorium oxide?"

"Yes."

"Sufficient for a couple of years."

"Then all you have to do is keep her going?"

"That's all," agreed Holland, straight-faced.

The other looked him up and down as if seeking an invisible joke at his own expense. Then he moved away to tend the drill.

Yarbridge used his mike. "Yarboo calling Booster One. Come in Booster One. Come in Booster One!"

He wasted his breath.

As the days rolled by they developed a tendency to ignore the radio most times or treat it with open skepticism when the temptation to listen became too much. The thousand friends behind Yarbridge's god had shrunk to little more than a dozen, the technical qualifications of the missing ones having drawn them into the detection and communications services of the armed forces.

The few survivors told little, though they could have said much. But they did not dare. Vertical beam antenna were now prohibited and their calls were monitored. They spoke briefly and pointlessly, with the extreme wariness of those peculiarly susceptible to the capital charge of disseminating information that might be useful to an enemy.

Yarbridge said wearily to Holland one day, "This is grim. Doesn't matter whether I get George in Memphis or Jules in Toulouse, he can't tell me so much as whether it's raining because somebody across the battle line might need that datum."

"If there *are* any battle lines," said Holland. He pawed his freckles, went on, "What beats me is that in all that gabble nobody mentions who's fighting whom."

"Everyone is fighting everyone," opined Wilkin, coming up behind him. "What else do you expect?"

"And when they do see fit to tell anything you get less than half of it," Yarbridge continued. "Listen to this."

He turned the volume control,

brought up a British voice that had been murmuring almost indistinguishably: ". . . And several more robot planes were shot down over London last night. The rest of the country—"

Switching off, he said, "There's a sample. He doesn't say how many. He doesn't say who sent them. He doesn't say what happened to the bomb loads when the planes dropped or what damage was caused."

"Of course he doesn't say," put in Wilkin. "In fact it's a wonder he says anything at all. But it won't be for much longer."

"Why?"

"The lights are going down across the world. Would *you* squat there and count them out loud for the benefit of an unimportant gang upon the Moon?"

"Who says we're unimportant?" inquired Hank, joining them and displaying aggressiveness.

"I do," Wilkin informed. "Who cares for someone looking out the top window when there's a free-for-all in the street?"

"It can't last," decided the other, not caring to argue the point. "They haven't got the stuff. Half a century back they'd have been using supersonic missiles and all kinds of other gadgets. These days they haven't got 'em. Armaments have hit an all-time low."

"Who told you that?" inquired Wilkin.

"Everybody knows it."

"Do they?" He put on a lopsided smile. "Pity we can't ask them today."

Hank scowled, edged nearer the radio and rasped at Yarbridge, "Unimportant or not, we're entitled to know what's happened to our wives and kids. Why doesn't the spaceport—"

It was a gag, for as he got alongside Wilkin he swung a huge fist into the metallurgist's face and grunted with the force of the blow. Wilkin crashed one way while his glasses flew the other. The thing was done with such suddenness that Hank was astride the victim and frisking his pockets before the others had time to interfere. Breathing heavily, he came erect holding the little automatic.

"I never did like sneery guys with guns." His eyes challenged them as beside him Wilkin sat up and held hands to features. He moved over to Yarbridge. "All right, Porky, get busy and raise the spaceport."

"How?"

"He asks me how!" His big hand gave the other's shoulder a shove. "You know how. Let's see you do it—and fast!"

Yarbridge obliged, then said, "There you are. I can call until my tonsils drop out. Now let us see you do better."

"How can I tell that you're calling them in the right place?" He pointed to the dials. "Or, for that matter, that you're correctly tuned to get

anybody on that set?"

"How do I know when a cutter is due to be swapped?" asked Yarbridge.

"Don't be funny with me!" A pulse was beating heavily in his forehead. "If the drill goes bust while I stand here a month, I'm going to—"

"You're going to do nothing we don't like," interjected Holland. "And you'd better give me that gun."

"You crazy?"

"Not yet."

"Me, neither," assured Hank. "So you can go take a walk."

"Thanks," said Holland. "I will." Shoving hands deep in pockets he ambled away, his lips pursed in a silent whistle.

Thirty seconds later the engine stopped. The drill ceased its weary grinding. The lights went out and there was no illumination save through the transparent peak of the otherwise opaque dome. The U-tubes set in the wall no longer fizzed and bubbled. No oxygen trickled into the interior and no hydrogen poured outside.

Hank crossed the circular area with a bull-like rush, gestured with the automatic. "Start her up."

"Sorry."

"I said start her up!"

"Do it yourself."

He examined the engine from end to end, seeking visible evidence of how to do it. Once or twice he toyed momentarily with a lever, stud or switch but thought better of it. He had all the layman's near-superstitious fear of hot-stuff.

"It's your job, not mine." He flourished the weapon again. "Go to it."

"I'm on strike," Holland informed. "My union has called me out."

"If you don't do as you're told, Spotty-pan, I'll put a slug through your bean."

"Well," hazarded Holland, thoughtfully, "that might be one way to get her operating. But I doubt it."

The other drillers had clustered around by now and one demanded, "What's the big idea, cutting the engine?"

"He's trying to show us who's boss," Hank growled. "And I won't have it. No kid's going to push me around."

"There's nothing for it but to make him see sense," put in Joe. He rolled up his sleeves, revealed brawny arms.

"That'll take you a couple of minutes," Holland pointed out.

"So what?"

"You won't have that long."

Joe took a hurried step backward. "No? Why won't we?"

Glancing significantly at the engine which could be trusted to remain quiescent for a million years, Holland advised, "Wait and see."

"Give him the gun, Hank," said Joe, nervously.

"Go on, give it him," urged the rest as panic mounted.

"I think he's a liar," declared Hank, mulish. "I think he's taking us for a ride. He wouldn't lounge there easylike if something were about to happen."

"I'm hoping it won't." Holland ostentatiously consulted his wrist watch. "Because I'm betting that your nerves will crack before mine." Extracting a handkerchief, he mopped his forehead, had another look at the watch.

It was an effective gesture. The driller alongside Hank decided that more waiting would be unendurable. He made a snatch at the gun, got it, strove to twist it out of the other's grip. Stubborn to the last, Hank hung on. The remaining pair suddenly made up their minds and joined the fray, ignoring Hank's grunts and curses. The disputed weapon emitted a thin, hard crack and planted a slug in the dirt between stamping feet. It came loose. One of them tossed it toward the onlooker who was still doing his best to maintain a phony expression of strained anxiety.

"Start her up! For Pete's sake start her up!"

The struggle ceased by mutual consent and all four tried to urge him with their eyes. He did things including several that weren't necessary and some they couldn't see. The engine moaned. He let in the generator clutch. The lights came on. The U-tubes bubbled and gassed.

"You big, awkward hophead!" one of them rumbled at Hank. "Why can't you leave well alone? Think we haven't got troubles enough?"

They went back to the drill. Hank stared a while at his own hands, opening and closing the fingers, favored Holland with a look of dark suspicion, then lumbered after the others.

Holland made for his sleeping space, picked up his helmet, checked the pressure in its little oxygen cylinder. He fitted the headpiece while Wilkin sat grimly nursing a split lip and Yarbridge watched in silence. Exiting via the double trap, he trudged through fine gray Lunar dust, past the stack of cores and at a suitable spot fired the gun until it was empty. Then he hurled it into the distance.

Returning, he removed the helmet, carefully placed it on its rack, lay down and studied the overhead circle of transparency. Wilkin still offered no remark.

After a while, Yarbridge said, "You were lucky to get away with that. I don't know that I'd have had the nerve to try it."

"Comes easier when you've done it once or twice before," Holland informed. "A few years ago I was compelled to learn that one needn't always be completely without means of defense. In the last resort there's often one thing that can be used and effectively."

"Such as what?"

"The other fellow's ignorance."

"Suppose he isn't ignorant?"

"Then it's your hard luck." He smiled to himself, went on, "But everybody is ignorant by one standard if not by another. I'd be a prize sucker for a radio gag if you could think up a good one."

"I guess so," agreed Yarbridge who had never given a thought to this aspect of his own ability.

He made up for lost time by commencing forthwith to examine the possibilities. As weeks and months rolled on and the situation worsened a crafty scheme or two might prove useful. Indeed, technical knowledge plus sharp wits might decide between life and death.

The ship did not come, neither on the appointed day nor a fortnight later. They required the extra two weeks to incubate to point of vocal expression the opinion that it would never arrive.

Other data supported this dread thought. The telescope had enough power to reveal numerous and sinister markings on Earth's land surface though not with clarity sufficient to determine their true nature. The instrument had to be used with imagination that might be over- or under-exercised according to the individual.

And night after night, day after day, brilliant flashes had been observed on the mother-globe, waxing and waning until finally they ceased. Only seven stations could be heard across the full widths of the long, medium, short and ultra-short bands. They were unintelligible, radiating high-speed but very weak signals in code. A week later there were four. Ten days afterward there was one. Then that, too, went off the air. The ether was silent. Earth rolled along her appointed course, a black ball on the night side, a shining picture on the day side, and gave forth no single voice.

At that point they took stock of food supplies. Originally enough packaged meals and emergency rations had been dumped to last seven men for twenty months and nearly a third of that time had now passed. If they reduced consumption to the minimum and rigorously prevented all waste, the seven might live another sixteen months.

That much being known, the arithmetic of the situation became obvious to each man, though he kept it strictly to himself, coddling it within the secret recesses of his own mind. If one died, so much the better for the rest; they'd make out another eighteen or nineteen months. If two went under, the survivors would gain a further spell of life. Three deaths would permit the remaining four to eat until the engine stopped—and beyond that, if they could.

The environment was beginning to force a distorted picture into each mind, making it see that the others

were not men with mouths, but mouths with men around them.

But this hidden reaction betrayed its presence in indirect ways. The hairy-chested quartet stopped the drill to cut down power consumption and—as they theorized—help eke out the precious reserve of hot-stuff. Holland noted the deed, deduced its purpose and did not bother to tell them that disintegration was held at a uniform rate regardless of power used. It could not be speeded up without danger nor slowed without ceasing to provide exploitable energy. Their action was futile.

One day Joe caught him away from the rest, sidled up, said, "I've been thinking."

"It's a healthy occupation," Holland approved.

"What if this gadget packs in?"

"Then it's my responsibility to get it going again."

"Yes, I know." He glanced around to make sure none were within hearing. "We're stuck here quite a spell. If anything happens to you, we're sunk."

"That's what I like about it," said Holland.

"I don't," declared Joe with some emphasis. "If you fall sick at the wrong time, it'll mean the end."

"Very true. So on no account must I become ill." He eyed the other shrewdly. "It might help if we reserved some whisky for an emergency.

The way it's evaporating out of sealed bottles there won't be any left pretty soon."

"It isn't me—it's the others," said Joe.

"It would be!" indorsed Holland.

Joe blinked and went on, "Anyway, what I want to say is this: that it's your duty to teach someone else to handle this groan-machine. One isn't enough. We need another who knows how."

"Such as yourself?"

"I could learn."

"I don't doubt it," said Holland.

"Well, why shouldn't you show somebody?"

"I may come to regret it—if one can have regrets in one's sleep."

"What d'you mean by that?"

"If your thinking has been taken far enough, you know darned well what I mean."

"Smart, aren't you?" spat Joe, momentarily vicious.

"The circumstances compel me to be," assured Holland blandly. Crossing fingers, he held them under Joe's nose. "This is me. Don't you forget it!"

Yarbridge came across as Joe stamped away. "He looks sour. You been rubbing him the wrong way?"

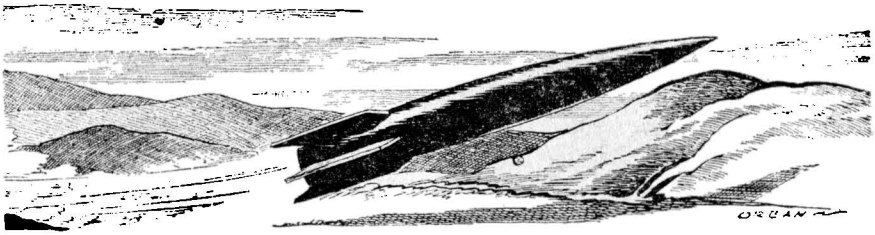
"He's just applied for the post of assistant atomechanic. I turned him down."

"Did you tell him you've been instructing me?"

"No." He pondered briefly, explained, "Three of us have completely different qualifications whereas the other four are and always have been birds of a feather. Each of those four knows what the others are doing and why they're doing it, at any given moment. They understand each other in a way they can't understand us. Our methods and functions defeat them. No matter how irrational it may be, people often tend to dislike what they're unable to understand."

"All the same, if there's a split in this group it's of their own making," Yarbridge observed.

"Yes, but we mustn't blame them for it. The division is in some ways as natural as the sunrise. So, if I'd told him I'd picked you instead of a driller as standby mechanic, it might aggravate matters."



Yarbridge gestured toward the food stack. "I fear they'll be more than aggravated by the time we've eaten most of the way down that. Sooner or later somebody's going to make us put on a local version of what's happened on Earth."

"While there's life there's hope," said Holland.

"Of what? A miracle?"

"A ship."

"That *would* be a miracle," declared Yarbridge, flatly.

He was wrong. In due time a ship came, deliberately and without benefit of supernatural forces.

It was ten months since those in the dome had first heard mention of the virus and by now they'd almost forgotten its existence. Events that followed had overshadowed the cause, like a prolonged riot in which none can recall who or what started it.

The food stack now stood at less than half its original height. The drill remained sunk to the best part of two thousand feet, its drive-gears motionless, its shaft red-brown with a fine layer of rust. The engine droned and shuddered, the lights still burned, the numerous heaters gave protection against night's exterior low of — 150°C. Moon-water still surrendered its oxygen and maintained the breath of life. The radio remained serviceable but had not been in operation for weeks.

Four oxygen-inflated beds were lined together on the perimeter, three more at the opposite side. This sleeping arrangement was symbolic of psychological antagonisms that no man wished to boost to a crisis yet no man was able to cure. Civilized conditioning persisted enough to hold the issue in precarious suspense at least for a little while longer, though each man knew deep in his soul that a time might come when one would starve to death while another sat and watched unmoved.

They were loafing around, four at one side and three at the other, each indulging the vacuous occupation of deciding what he could do with most if only it were there. Conscious of his age, physique, and the shape of things to come, Wilkin yearned for his lost gun. Hank ached for his wife and kids but refused to show it or mention it. Yarbridge's need was no more than a familiar voice seeking him out and calling him in.. Holland's choice, vividly and tantalizingly depicted in his mind, was a two-gallon can of pineapple juice, cold or warm.

And the ship came.

It screamed overhead and howled into the distance and turned in a wide sweep and came back with a rising roar. The sounds cut off. The dome trembled slightly as great tonnage sat itself outside.

Hank stood up with little beads of moisture on his forehead. He had the expression of a sleepwalker. The others came to their feet seeking visible confirmation that all ears had

heard the same.

"The ship!" said Yarbridge on a note of incredulity. "It can't be anything else but the ship!"

"Didn't make that sort of noise last time," observed Wilkin, unwilling to jump to conclusions. He felt vaguely around his pockets as if looking for something without knowing what. "Maybe it's a different one."

"Sounded different to me," confirmed Joe. "Bigger and faster."

"I'll take a look." Holland picked up his helmet.

A loud knocking sounded on the double-trap before he had time to fit the headpiece. He dumped it, went to the trap with six pairs of eyes watching, manipulated the locks.

The three who entered were not human.

Gray uniformed, gray-blue skinned and hairless, they came into the dome with the casual, unsurprised air of neighbors wanting to borrow the mower. They had two arms and two legs apparently formed of cords and cartilage rather than muscle and bone, for they bent in a curve from end to end instead of at a mid-joint. The six fingers of each hand were similarly bendable and jointless.

Apart from these noteworthy features of strange coloring and rubber skeletons they approximated to human appearance. Their mouths looked natural, their eyes were of human type, their ears normal enough though somewhat large. All three stood a couple of inches above Holland, the tallest of his group. All three were bald and hatless.

Wilkin was the first to break the silence. He peered over the tops of his glasses as if to insure that they were not causing an optical illusion, and said, "Who are *you?*"

"That doesn't matter," responded the foremost of the trio. "Does it?"

"Where did you learn to speak English?" put in Holland, having expected communication by means of signs and gestures. He felt behind to check that he wasn't flat on his mattress and deep in a ridiculous dream. His hand prodded Yarbridge's paunch.

"On your own world of course. Where else could we learn it?"

"Can you take us back there?" inquired Hank, single-mindedly dismissing everything in favor of one aim.

"We have come for that purpose." The alien glanced around, noting everything but not curious. "We intend to leave with the minimum of delay. Do whatever is necessary before you depart and do it quickly."

It wasn't a request. It wasn't an order. It was a plain statement of plain fact, devoid of either politeness or authority. Somehow it created a cold impression that the speaker was not in the habit of asking or telling, but rather of presenting a realistic case and awaiting the inevitable result. An inhuman, unemotional mind con-

cerned only with facts.

They packed in a hurry, their minds filled with a thousand questions postponed by the glorious vision of escape. It did not occur to any of them to view the newcomers as enemies or treat them with hostility. They had no data to go upon. So far as they were concerned the Martians —or whoever they were—had turned up at long last and at the most opportune time.

Each bearing a pack of personal belongings, they donned helmets, followed the three from the dome. Holland, the last out, switched off the nuclear engine, fastened the double-trap. Filing aboard a vessel several times the size of those with which they were familiar, they were conducted to a large cabin and left to themselves. The ship boosted immediately afterward, plunged toward Earth.

Nobody talked much. Shock of alien contact plus inward speculation of what was awaiting at the other end kept them fairly silent until the landing. The trip had taken fourteen hours, less than half the time they'd required on the outward journey nearly a year ago.

An alien not identifiable as one of those already seen appeared at the cabin, said, "We are grounded and you may leave. Follow me." Conducting them to the long ramp leading from the air lock, he pointed outward. "You will find food and accommodation in that camp. We'll summon you when required."

Descending the ramp, they set feet on bare brown earth, paused to survey their surroundings. Straight ahead stood a large collection of hutments typical of an army training center. To the left were the outskirts of a medium-sized town. Mountains loomed in the far background and a small river flowed on the right.

"Where's this?" Yarbridge glanced around, noted that no alien had stayed with them. "Anyone recognize the place?"

"We can find out." Hoisting his pack, Holland started forward. "We've got tongues in our heads."

Hank moved up alongside him, recent differences forgotten. "What did that guy mean about calling us when wanted? Does he think we're going to squat in this dump until somebody whistles to us like dogs?"

Holland shrugged, offered no comment.

"If so, he's got another think coming," Hank went on. "I'm more than grateful for the hitch from up there but that doesn't mean I've got to wait for the official thank-you ceremony. I'm going home and fast! What's the use of making for this camp?"

"Before you know which way to go and how to get there, you've got to find out where you are."

"You may be a thousand miles

from home," Yarbridge contributed. "With all the world to pick from you can't expect those aliens to dump you in your own back yard."

"I don't care if it's a million miles. I'll make it if I have to crawl it. I've a wife and kids."

"I had a daughter," said Wilkin, dull-toned. "And I doubt whether I'll ever see her again."

"Shut up, Misery!" growled Hank.

Passing through the main gates they went to the first hut. It contained forty Chinese, men and women, who eyed them with blank indifference. They tried the second. That held a weird mixture of races including a half-naked brown man with a bone through his nose.

"Anyone know English?" called Holland.

A trembling oldster came from the back. He had a long, untended beard and hot but rheumy eyes.

"I do, my son."

"What goes here?"

"What goes?" He had a moment of muddled mystification before his lined features cleared. "Ah, my son, you seek enlightenment?"

"That is the idea," agreed Holland. "More or less."

"You are inspired," informed the other, grasping him by the arm. "For you have come to the right place and the right person. I have been privileged to save the world. I saved it upon my knees, a sinner crying at the gates of heaven. I prayed while the city fell and children screamed and the unrepentant died." The grip tightened, the eyes grew hotter. "Until finally my voice was heard and help came from the skies. Listen, my son, if you, too, will have the grace—"

"Sorry, dad, some other time." Holland pulled gently away.

They transferred attention to the third hut, leaving the oldster querulously mumbling in his beard. Outside the door of this adjoining place a big brawny man stood watching their approach.

He rasped as they reached him, "Another bunch, eh? Where did they find you?"

"On the Moon," Holland told him.

"So?" He studied them from beneath bushy brows, then offered, "Some folk don't know when they're well off. Why didn't you stay there?"

"Would you?"

"Hah! You bet your shirt I would!" He spat on the ground. "Unless I could find a way to drop it on this alien mob that has darned near wiped out humanity."

Hank pushed forward, his beefy features working. "It doesn't look wiped out to me."

"It wouldn't," agreed the other, giving him a calculating up and down. "We're all here in this camp and in that town. All sixty thousand of us. There aren't any more except a scattered few being found and dragged in like you."

"There aren't any more?" Hank had difficulty in understanding it. "You mean—?"

"The world is empty save for this collection of racial remnants." He waved a hand to indicate the local area. "This is us—Homer Saps."

"You sure you know what you're talking about?" asked Yarbridge.

"I ought to, mister. I've been here most of a month." He gave them another shrewdly estimating look-over, went on, "My name's Deacon. I'm an Australian, not that that means anything these days. If you fellows are wanting some place to bunk, you'd better come in here. We've room for ten and we'd rather have you than a gang of half-wild, half-witted Dyaks or Hottentots."

They followed him inside. Spring beds were lined against both walls, each with a cupboard and arms-rack. A tattered and faded military notice in English flapped behind the door. Some thirty men, mostly white, observed their entrance apathetically. One of them had the broad, flat features and monkish haircut of an Eskimo.

Slinging his pack onto a vacant bed, Holland inquired, "Just where are we?"

"Outside a place called Kaystown in Alberta. It jumped up in two or three years after someone struck oil. Nearest dump of any size was Lethbridge."

"*Was?*"

"Half of it's flat and the rest is empty."

He sat on the springs, stared at the wall, subconsciously noted that the windows needed washing. After a while, he asked, "How do you know these aliens caused it all?"

"They told me so."

"They openly boasted of it?"

"No, I can't say they bragged," admitted Deacon with a mite of reluctance. He looked as though he'd have enjoyed another forceful spit had he been outside. "They're neither conscience-stricken nor triumphant. They mentioned it as an accomplished fact, like saying that two and two make four."

"I wonder," mused Holland.

"You wonder what?"

"Whether they're opportunists. Whether they're kidding. Maybe they're cashing in on a ready-made situation. Maybe they're grabbing the discredit in order to establish psychological mastery."

"You think they mightn't have done it?" Deacon's features hardened.

"It's possible."

"Won't pay you to talk that way around here."

"Why not?"

"You've had it easy on the Moon, little as you may know it. You've not tasted what most folk down here have experienced. And they're touchy, see? They don't like these aliens and they won't be amiable toward anyone who does like them." He leaned forward.

"There's hatred all around, long, fierce, all-consuming. If you sniff, you can smell it. If you look, you can see it."

"Then why don't they do something about it? Sixty thousand against one ship—heck, they could swamp it!"

"The idea has been stewed until it's boiled to rags," Deacon informed. "For one thing, they have weapons and we haven't. For another, what they've done before they can do again."

"What are you getting at?"

"They dropped a virus. It ate green stuff at faster than walking pace. It killed the grass and everything that lives on grass directly or indirectly. But it left the seeds lying below ground. So now they're coming up; the grass is returning. All that those rubber-legged caricatures need do is sling out another dose of poison. That would wipe out the new crop and the only seeds still down would be the ones that refused to germinate. It would mean finish!"

One of the listeners put in, "Besides, what's the use of jumping the ship unless we can catch them all together? We can't. They've a flock of little boats constantly roaming the world."

"And there are plenty more aliens wherever they've come from," contributed another.

"Do you know where they came from?" Holland asked Deacon.

"Nowhere around this neck of the cosmos. Some faraway star that hasn't a number, much less a name. That's what they say."

"Hm-m-m!" He pondered it for quite a time, then remarked, "So they're a long, long way from home. I'd like to know more about them."

"You'll know plenty before you're through," Deacon promised. "For myself, I'd like to see them at the seventh layer of the seventh hell!"

The summons came late next morning. One alien appeared armed with no more than blank indifference to the looks with which he was greeted. He went from hut to hut until he found the seven.

"Come with me."

Hank bristled forthwith. "Who does he think he—?"

He closed his trap as Holland jogged him with a sharp elbow. "Let's not become noisy just yet."

The alien stood watching them with blue, humanlike eyes. His strangely colored and impassive face gave no indication of whether he had heard the brief exchange.

Holland went out with Yarbridge close behind. The others hesitated, then followed. They walked to the ship without further remark, trailed their guide to a cabin in the nose occupied by four more of his kind.

Without preamble the biggest of the four picked on Joe and asked, "What is your profession?"

"Boring engineer," informed Joe. "A driller, like these." He indicated the other three.

"Driller of what?"

Joe explained it more fully.

"So four of you do the same thing." The other thought it over, turned to the guide, said, "They should interest Klaeth, he being a geologist. Take them to him."

Yarbridge's turn came next. Admitting that he was a radio operator he was rewarded by being sent to interview an alien named Ygath. Then Wilkin was questioned.

"Ah!" exclaimed the alien. "A metallurgist, no less. That is gratifying. Mordan has been hoping to find one such as you."

Wilkin was conducted elsewhere. He followed his guide gloomily, his pale eyes dull behind his glasses. That left Holland as the last for treatment.

"And you?"

"Atomechanic."

"That tells us nothing. Just what do you *do*?"

"I tend and service atomic-powered engines."

"What do you mean by atomic-powered?"

Holland's back hairs gave a twitch but he permitted no surprise to show in his features. "It is power derived from the controlled decomposition of certain unstable elements or compounds."

"Metals?"

"Certain rare metals or their oxides."

"You had better stay here," declared the other. "I shall deal with you myself." He switched to a sibilant language as he addressed one of his companions who went away, returned in short time with a wad of papers.

"These are the documents you require, Drhan," he said, handing them over.

Scanning them rapidly, Drhan nodded approval, pointed to a tubular chair, told Holland, "You will sit there." When he was seated Drhan studied him a while, frankly trying to estimate his intelligence and capabilities. Finally he informed, "It was as well that we picked you and your friends off that dead satellite. You are all technicians and we are badly in need of technicians."

"Why?"

"Because we have acquired a world replete with things we do not understand."

"Indeed?" Holland cast a significant glance at the huge and complicated instrument board beneath the bow observation port. "Yet you're miles ahead of us there."

"You think so?"

"That's how it looks."

"It would," agreed Drhan. "But appearances can be deceptive. We are backward in many branches of science. A ship such as this is something we might not have developed of our own accord for centuries to come. Fortu-

nately, others did the job for us. We have gained a big advance by proxy." Without bothering to explain in greater detail he indulged another unconcealed summing up of his listener. "Now these others teach us how to build ships and run them. In return we permit them to eat."

"You permit them?" Holland sat up, feeling cold.

"Yes." The gray-blue face remained blank. "Though backward in some respects we are advanced in others. Like everyone else, we have developed weapons characteristic of the subjects in which we excel. Ours are effective, as you have seen for yourself. We do not destroy people. We are content to destroy food and leave people to obliterate themselves in the battle for the remaining crumbs. We persuade the opposition to slaughter itself."

"That must save you an awful lot of bother and heartache," remarked Holland.

If the other perceived the sarcasm he did not show it, for he added with the air of one stating an obvious and incontrovertible fact, "Take away food and you take away life. No more is necessary, no more need be done."

"Why deprive us of ours? What have we done to you?"

The question did not accord with Drhan's alien logic because he had to mull it quite a time before he said, "You have done nothing to us. Why should you? How could you? We want your world because we need it. We have taken it because it would not have been given had we asked for it. We struck effectively and without warning because that is the best guarantee of success. Surely you can see the sense of that?"

"I can," admitted Holland, grimly.

Drhan went on, "Far, far in the past we stood urgently in need of another world reasonably similar to our own but could do nothing about it until we acquired ships. Then for four hundred of your years we searched the cosmos around us before we found one and seized it. In due time we had to have another. It took us twice as long to discover. Now we must have a third. There aren't many that fit our specification; they're rather rare. It has required almost two thousand years to find this one of yours."

"Two thousand? Do you live *that* long?"

"Of course not. Those two thousand years cover many expeditions sent out generation after generation."

"Do your people know that you've found this world?"

"Not yet. Not until some of us return to tell them. We have no means of sending signals so far. The ship will have to go back with precise details of location." His eyes gazed shrewdly into Holland's and for the first time his face showed the faintest glimmer of a smile. "From the view-

point of your kind that is something worth knowing, as doubtless you have decided. It means that if you can permanently disable this vessel you will escape our attentions for another two thousand years. Doesn't it?"

"The idea is not without attraction," Holland admitted.

"Therefore I suggest that you discourage any hotheads from trying," advised Drhan. "There are few of you left. It would be a pity if there were none."

"Why leave any at all in the first place? You could have killed off the scattered survivors."

"And thus destroy the knowledge we must acquire?" He motioned toward the wad of papers lying on his desk. "Already we have done much exploring. And what have we found? That this world is full of ingenious machines some of which we understand, some of which we think we understand, and others of which we know nothing. But they are ours by right of conquest. They are a valuable part of our inheritance. We must learn to use them, know how they operate right down to basic principles. How are we to learn these things without waste of time?"

"How do you expect?"

"That those who know will teach us."

"Or what?"

"There is no 'or' about it," assured Drhan with all the positiveness of experience. "The will to resist weakens as the body shrivels and the belly becomes bloated with hunger. We know. We have seen it happen again and again."

"Unmoved?"

Once more his mind had to plow through unaccustomed labyrinths to catch the question and try to pin it down. And then he could not devise a satisfactory answer.

With mild complaint, he said, "I don't comprehend. The issue is a simple one, namely, we or you. The result is perfectly proper and natural: the weak become subject to the strong."

"And the stupid to the clever?" suggested Holland.

"It is the same thing," declared Drhan. Picking up the papers, he sought through them, his fingers bending either way with equal facility. "Now, we have here several reports of certain great power machines devoid of visible fuel supplies. I presume that these are the atomic mechanisms of which you speak?"

"Probably."

"Then you will explain them to us."

Obediently Holland got on with the job of explaining.

Deacon made the springs squeak as he sat up and asked, "They try to pick your brains?"

"That was their purpose," conceded Yarbridge. "They know something of radio but haven't got as far as frequency modulation, let alone ster-

eoscopic T.V. and suchlike stuff. They're just emerging from the spark-signal stage."

"How much did you tell them?"

"A fat lot. I can't hand out in one day what took me about three years to acquire."

"Don't tell 'em anything," Deacon ordered, making it sound authoritative. "Feed them a lot of useless guff instead. That's what I did. I was sitting with a ton of food in the loneliest part of Northern Territory when one of their little boats picked me up. I'd been prospecting in happy ignorance of what was happening elsewhere. I'd found a dollop of slaty flakes in a river bed and knew I'd struck osmiridium. Think I told them all that? Not on your life! I misled them up the garden path. You do the same if you want peace!"

"It's not so easy for us," put in Joe. "We can't kid them our drills bring up lots of little brass Buddhas."

"Say you go round poking for fresh water. Make it sound scientific and say you plant a drill wherever a hazel twig jerks around. That'll get them playing with bits of stick."

"You don't credit them with much intelligence, do you?" inquired Holland.

"Do you?" Deacon countered aggressively.

"Certainly."

"You would!" said Deacon, beginning to dislike Holland and not hesitating to show it. He glanced around the hut, found moral support in many faces. "I bet you think them a good deal sharper than what is left of your own kind?"

"Not necessarily."

"Backing out, eh?"

"Not at all. I say I don't think them dopey."

"Meaning you think we are dopey?"

"When you consider the present state of affairs there is much to be said for that theory," said Holland. "But I don't agree with it. Not just yet."

"Not here, you don't," observed Deacon, pointedly. "On that ship it may be different. Perhaps you change your mind to suit the company you keep. How much have you been telling them of what you know?"

"As much as can be told in a few hours."

"A Kahsam!" pronounced Deacon, gaining color.

Low murmurs sounded around the hut. Men fidgeted, rubbed their knuckles, eyed Holland with antagonism; all but the one who resembled an Eskimo and didn't know a word of English.

Holland began, "Not knowing what a Kahsam is supposed to be, I—"

"I'll tell you." Deacon stood up, walked heavily to the other's bedside. "First wise-boy they took on board was a bleary little goat named Kahsam, a professor of languages from some snoot college. He spent a fortnight teaching them English and was

tickled to bits because they learned so fast. He was overjoyed to help those who'd filled his college with corpses."

"Did he know that at the time?"

"Shut up and listen, will you? He did his stuff for two weeks and thought himself mighty cute. When they'd finished with him they dumped him in one of the most comfortable apartments in town, gave him a food priority certificate."

"That was nice," said Holland, lying back and surveying the other's angry features.

"First chance that came along we pulled him to pieces," informed Deacon, displaying savage satisfaction. "His playmates haven't missed him yet." Licking thick lips, he added with sinister meaning, "Since then we've got a name for any guy who willingly and persistently collaborates with the enemy. He's a Kahsam. A traitor to his kind is a Kahsam. Sooner or later he goes the same way."

"I wouldn't care for that," admitted Holland, rubbing his freckles and grinning upward.

Irritated further by this airiness, Deacon went on, "I invited you and your bunch in here so as to keep other types out. That means I've a duty to warn you when you're sticking out your necks. You've an equal duty to take notice and not try us too far." He paused a moment, added, "Because what I've said isn't just talk!"

With that he returned to his bedspace, lay down and scowled at the roof. Other men studied him in silence, now and again frowned at the culprit. The Eskimo gazed steadily at nothing while Wilkin blinked at him through thick glasses and the four drillers proceeded to deal a worn and filthy pack of cards.

After a while Holland sighed introspectively, went out for a breath of night air and a look at the stars. A minute later Yarbridge joined him.

"That Deacon is a natural ringleader," whispered the radio operator.

"I know."

"He's a decent enough guy providing you don't offend his sense of what's right."

"True, brother, true."

"Then why try making an enemy of him?"

"I need enemies."

"Jumping jiminy!" said Yarbridge, low-voiced. "We're in enough of a mess without stirring up more."

"Worry not nor weep tears of dire despair," advised Holland, patting him on the back. "I am the Kahsam, not you."

"It's nothing to joke about," Yarbridge insisted, looking serious. "These survivors are jumpier than a flea in a hot oven and they can't be blamed for it. They've seen, heard and felt things that we avoided while on the Moon. They are pinned down here with too little to do and they can't escape because a man must eat while on the run."

"I am not lacking in imagination," Holland reminded.

"Then why don't you use some of it? If you insist on flaunting treachery in their faces, you're liable to beat it to the ship six yards ahead of a lynching party."

"You must have precognition," said Holland, patting him again. "Such a fate is my purpose, my desired aim."

Staring at him in the starlight, Yarbridge muttered, "I'll keep you out of trouble whether you like it or not."

"How?"

"First time you're not around I'll warn them that you're going off your nut."

The warning was effective for a time. He went to the ship every morning, returned to the hut each evening and was met with uneasy suspicion rather than open hostility. Their ready acceptance of Yarbridge's diagnosis was natural in the strange circumstances for not a day passed without some man running amuck in the nearby town or some woman creating an hysterical scene as overtaxed nerves finally snapped. It was understood by everyone that at any time a man or woman might prove unable to take it, be calm today, completely crazy tomorrow.

Thus the mental conditioning born of the situation impelled them to treat him much as one would a prospective lunatic and it was ten days before they found cause to revert to their original attitude. He entered the hut at dusk, sat on the end of his bed, spoke to Yarbridge.

"I won't be here tomorrow."

"How's that?"

"They're flying me south."

"Only you? Not the rest of us?"

"Only me. I'm going down in one of their little lifeboats. They want samples of hot-stuff to take back to their own world."

Erupting from his bed-space, Deacon loudly demanded, "Are you helping them get it?"

"Of course. It's buried deep in an abandoned plant covering six square miles. They don't even know what to look for—so how can they dig it out without help?"

"So much the better," said Deacon. "Left to themselves they'd never find it or recognize it when it was right in their rubbery mitts. But you have to open your dirty big trap!"

Somewhat mordantly, Wilkin chipped in, "We've got to look at things as they are rather than as we'd like them to be. I don't see how we can get by without playing ball even if we play no more than we can help."

"You wouldn't see," growled Deacon. "You're old and already half-dead behind those weak eyes." He put big fists on big hips. "Let me tell you something, mister: that virus can't live without food any more than we can. I got that straight from the

rubber boys who invented the stuff. Twenty hours without chlorophyll kills it stone dead. Know what that means?"

Staring stonily forward, Wilkin did not reply.

"It means that this world has been virus-free for weeks, maybe some of it for months. If birds hadn't carted it around, it might have been free before then. The virus has eaten itself out of existence. Untouched seeds are coming up. North of the town are skeletal trees already forcing out new buds and leaves. There are acres of tiny shoots that will become badly thinned-out corn. When those lousy invaders beat it we shall be able to cope for keeps providing we can last out on canned stuff the first couple of months."

"They know we can cope," Wilkin answered dully. "Mordan said so."

"What else did he say?"

"They'd leave us in cold storage, be gone two and a half years and come back in great strength with many ships. By that time we should have far more food growing around than sixty thousand can eat—and if we want to keep it we'd better have the bands out and the flags flying for them."

"I'd as soon kiss a flock of croco-

diles."

"What alternative do you suggest?" invited Holland.

"Not the one you've chosen," snapped Deacon, his complexion darkening. "I'll be a Kahsam for nobody."

"I'm with you there," declared Hank, standing up and scowling at Holland.

"Me, too," supported Joe. "Knuckling down can go too far. When a guy hands over atomic power for the asking, I reckon—"

Yarbridge shot to his feet and flapped pudgy hands. "Quit snapping and snarling. What do you bums know of atomics?"

"Not much," said Deacon. He jerked a heavy thumb in the general direction of the ship. "But it's more than those stinkers have any right to know. It's enough to tell me that atomic power is a gift too big for those we don't love."

"You said it!" endorsed a dozen voices emphatically.

"Furthermore," continued Deacon, encouraged without needing it, "you're a radio guy, not a nuclear specialist. So what do *you* know about it?"

"The stuff is dangerous to handle. It has to be moved with tongs half the length of a flagpole or, better still, by remote control. What will it do to that crowd if in their innocence they start playing with it like sand?"

Taken aback, Deacon eyed him uncertainly. "You think the radiations will burn them to crisps?"

"I don't know for sure." Yarbridge gestured toward Holland, who was reposing carelessly on his bed and listening with academic interest. "But he does! And on the Moon he made a remark I haven't forgotten. He said that when you're without any other means of resistance you can take advantage of your opponent's ignorance."

"So that's the idea!" Deacon stewed it a moment, said to Holland. "Why didn't you tell us instead of lolling around and watching us go on the boil?"

"Because it is not the idea," Holland informed. "They know that radiation is highly lethal and that the stuff must be handled with extreme care. I told them."

"You did?" Deacon seemed unable to believe his ears. Eventually he hoarsed, "There you are, men, a Kahsam!"

"He's kidding us," suggested Yarbridge, bewildered and reproachful.

"I told them," repeated Holland, irritatingly matter of fact. Putting feet on the floor he braced himself. "They took a steel safe out of one of the town's banks this morning and have lugged it on board as a suitable cupboard for samples."

"That's right," endorsed a gaunt, blue-jowled man at the other end of the hut. "I saw them carting it away and wondered—"

"They're not having it *all* their

own way," asserted Deacon, veins swelling in his neck. "Without this dirty Kahsam they'll be stumped!"

So saying, he made a mad-bull rush for the traitor's bed-space. A dozen others jumped with him. Anticipating this, Holland had come to his feet, ready and prepared even while looking casual. Now he leaped the Eskimo, bed and all, shot through the door into outer darkness. He ran for the ship, moving in long, lithe strides that heavier men would find hard to overtake.

Behind him occurred the precise sort of delay for which he had hoped. Fury is impetuous, possessed of no time or inclination for thought; therefore the enraged dozen attempted the impossible by trying to get through the door in a solid bunch. They jammed together, cursing vividly, until Deacon, Hank and a couple of others tore themselves free by main force and raced after the fugitive. Forty or fifty from neighboring huts emerged and joined the chase on general principles.

It was most of a mile to the space vessel and Holland made it two hundred yards ahead of a skinny but whipcord-muscled pursuer who had shown a surprising turn of speed. A bright light bloomed above the ship's lowered ramp as an alien guard detected the oncoming rush of feet. Holland ran up the ramp and through the open lock unopposed by the guard. Two more guards appeared, motioned him farther inward before they joined the third at the lock.

The one who had switched the light bawled, "Hold it!" About to mount the ramp, the skinny runner paused, glanced behind in search of support, glowered up at the guard. The rest of the pack arrived, milled around and oathed while each waited for someone to bell the cat.

"Go away," ordered the guard.

Deacon planted a big boot on the ramp, told him, "We want that louse you've just taken aboard."

"What've you got against lice?" called a voice from the back. "He's a stinking Kahsam!"

"Go away," repeated the guard, not interested in reasons or causes.

For a moment it seemed as if Deacon were about to take the lead and thus precipitate the general rush, but he thought better of it when the guard produced a high-pressure hand-spray. His companions continued to fidget around murmuring oaths and threats.

His eyes gleaming as he scowled up toward the ship's light, Deacon said to the guard, "All right, you can keep the dirty scut and welcome! And we mean keep him—for good!"

"Go away," repeated the guard, impassively.

They went slowly and defiantly, balked of their prey and voicing their disappointment with lavish use of adjectives. Standing behind an ob-

servation port, Holland watched them depart, then spoke to Drhan and Ygath at his side.

"They're in an ugly mood. It is hard for people to be coldly realistic after many highly emotional experiences."

"I suppose so," commented Drhan. He scratched a large ear with a flexible finger. "It is well that you have kept telling us of rising danger to yourself and that we held the lock open as you requested."

"We could have foreseen it without being told," remarked Ygath, "had we known the importance of this atomic power."

"Naturally they don't like us taking the biggest thing they've got," agreed Drhan. "I might feel the same way myself if the Shadids grabbed our best biological weapons." He glanced at Holland, went on, "Therefore we're so much the more indebted to one mentally capable of looking facts in the face. And that in turn creates a minor problem."

"Meaning me?" Holland asked.

"Yes. We cannot take you with us. We dare not leave you here, especially since we want your services when we return."

Ygath suggested, "We can establish him with adequate food supplies either on the other side of this world or upon the satellite. He would be beyond reach of petty vengeance and should be safe enough until we return. Then he'll have our protection."

"Don't let it bother you," said Holland. "You can dump me here."

"What, after that scene outside?"

"I know my own kind. You're departing in two days' time. By then they'll have simmered down."

"Are you certain?"

"I'm fairly sure. They aren't without logic. They will realize that what has been done can't be undone. A few may argue that perhaps it's all for the best. The others will be soothed by your going even though you're coming back. Probably they'll get busy trying to plot a hot reception for you."

"Which will be more than futile," Drhan assured.

"I know it," agreed Holland.

They eyed him, seeking a double meaning, found his features showing the confidence of one who knows himself to be on the winning side. It pleased them even though deep in their hearts each had a mite of sympathy for Deacon.

Nobody likes a traitor, not even those who use him.

Mid-morning two days later a repeated thrum of propulsors drew the attention of those in the camp and the nearest outskirts of the town. Assembling, they watched in sour silence while several lifeboats zoomed back to the mother-ship and were taken on board. The large vessel then belly-slid through sandy soil, flared and roared, made a bound, finished at an upward tilt on the side of a small hill four

miles farther away. Its tubes ceased their bellowing.

"Must be making ready to beat it," remarked Hank.

"Can't be too soon for me," said Joe.

"Wonder what's happened to Holland," Yarbridge ventured. He shifted restlessly, expecting vituperative reproof for mentioning the name. "Somehow I don't think he'll go with them."

"They'll dump him some place else," suggested a burly, red-haired man. "The devil looks after his own."

"I'd like to find him where he's planted," topped another, lending it menace.

Several voices supported that. They continued to observe the vessel now made too small by distance for them to discern individual activity around it. Nobody had binoculars; in bygone weeks that now seemed aeons all such instruments had been confiscated for the use of armies now dead and gone.

After most of an hour somebody reported, "One of them is coming this way. Maybe he wants to shake hands all round. No hard feelings and all that. It was just in fun. Rubber Boy loves Homer Sap."

Shading his eyes with a hairy hand, Deacon stared lengthily. "It isn't one of them. It's the Kahsam, no less!"

"He wouldn't dare," said the redhead incredulously.

"He would and he is," Deacon asserted. Again he studied the distant figure tramping steadily toward them. "And I can guess why."

"Why?" invited the other.

"Bet you he's bringing a message from his lords and masters telling us what they'll do to us if we touch one hair of his precious head."

"I'll take my chance on that," declared the redhead. He examined a clenched fist. It was big and rawboned.

"Lay off him, Lindsay," Deacon ordered. He cast a warning frown at all within hearing. "That goes for the rest of you, too. If the rubber boys are taking it skyward, we can well afford to wait until they're out of sight." His authoritative gaze went over each surly face. "Then we'll have him all to our little selves and what the eye doesn't see the heart won't grieve over!"

"Yes, that makes sense," Lindsay admitted with reluctance. Shoving hands in pockets, he controlled his emotions.

Following this cue, the others forced themselves to cool down. Presently Holland arrived at rapid pace, stopped a few yards from the mob and immediately in front of Deacon.

"They're waiting for the last lifeboat," he informed. "When they've got it aboard they're going home."

Nobody made remark. They stood together, hard-eyed, content to bide their time.

Licking his lips, Holland went on, "All right, if that's the way you feel."

He moved forward. "Me, I'm not going to stand when I can sit."

"You'll neither stand nor sit pretty soon," screamed a nerve-strained voice at the back.

"Shut up!" roared Deacon, glaring over the heads of the front ranks. He threw a meaningful glance toward the alien ship, pretended to consult the watch he didn't possess.

They got it. Opening a path to permit Holland to pass, they closed in behind him, escorted him to the hut. Fifty crowded him. Three or four hundred massed outside the door. One man held a needle-sharp fishing spear made from a prong of a garden fork. Another carried a length of nylon cord scorched at both ends.

Squatting on the end of his bed, Holland wearily rubbed his freckles, favored Yarbridge with a tired grin and said, "I suppose all these gloomy looking gumps resent me shoveling hot-stuff aboard by the ton?"

"Well, haven't you?" inquired Yarbridge, hopefully.

"I gave them enough."

"One ounce is too much!" harshed Deacon, chipping in.

"What can you do with a mere ounce?" Holland asked.

"Close your gab!" advised Lindsay, scowling at him.

"Or use it to say prayers," suggested another.

A man outside called through the door, "The lifeboat's just come back. It won't be long now!"

Everyone stared the same way: at Holland.

He said to nobody in particular, "Naturally they wanted the whole works, blueprints, formulae, extraction techniques, samples of thorium, radium, uranium, plutonium, neptunium, the entire shebang. They wanted sufficient to enable them to set up in business way back home. I couldn't give it all—the stuff wasn't there."

"But you gave all you could?" invited Deacon.

"Yes, Beefy, I did. I gave them precisely enough. They will stash it in the safe and—"

A light of near-blinding brilliance flashed through the west-side windows. Beyond the door a man howled like a hungry wolf. Then the ground shuddered. The hut gave four violent jerks, a sidewall cracked and let more light pour in. There was no sound other than that of witnesses outside.

The bunch at the door ran west with one accord. Several in the hut chased after them. Deacon stood up, his heavy features mystified.

"In the name of glory, what was *that?*"

"I told you," said Holland. "I gave them enough."

Making up his mind, Deacon rushed out, looked westward. The others pressed behind, gazed at an immense gout of vapor rising more than four miles away. It was monstrous, fright-

ening despite its familiarity. Nothing could be seen of the alien ship.

Swiveling on one heel, Deacon said in stifled tones, "That was your sweet trick."

"I needed hate here to establish trust and confidence there," explained Holland. "I got it—and it worked."

Turning his back upon him, Deacon bent down with elbows resting on knees. "You know what to do."

Holland surveyed the proferred rear end. "Great as the temptation may be, I resist it. Not because I forgive you. I think we can arrange a wallop more effective."

Coming up quickly, Deacon eyed him suspiciously. "Such as what?"

"According to statistics they had on that ship," Holland continued, ignoring the question, "humanity clung to a basic convention even in its death throes, namely, women and children first. Result: we survivors number more females than males."

"That's right," a voice endorsed. "About five to three."

"If we double our number every thirty years, we'll be a formidable swarm before one thousand, let alone two thousand. And we aren't starting from trees and caves. We're starting with salvable parts of civilization and we still have the know-how." He jerked an indicative thumb toward the town. "Ten to one that somewhere in there are a couple of nuclear physicists and umpteen other experts who've been making like bricklayers while nosy aliens were around." He paused thoughtfully, finished, "And between the lot of us we must have learned some useful things about that ship. The next one just won't get this far. It will regret the attempt."

"So did that one!" bawled a voice.

It was like the snapping of a tense cord and brought a roar of triumphant cheers.

When the noise had died down, Holland said, "Large families will help. So when we get around to lawmaking" —he studied Deacon, walked round him a couple of times looking him up and down as if inspecting a prime hunk of beef—"we'll have to make bachelordom illegal."

Deacon flushed and let out an agonized yelp of, "Hey, you can't do that to me!"

"We can," assured Holland amid surrounding laughter. "And what's more, we shall!"

He was wrong there. Ten days before such a law was passed a buxom widow put the bee on Deacon.

THE END

PAX GALACTICA

BY RALPH WILLIAMS

If a man gets pushed around, driven and harried, into giving up his weapons, forced to be peaceful . . . it's all for his own good, after all . . .

In North America, it was a bright, cool April night when Galactic Security, after several years of careful observation, decided the Solar Phoenix was a little too hot for Terrestrials to play with.

Early Warning, as was its function, made first contact as the ships flashed up over the northwestern horizon. The first report was disbelieved, it was off the grid and too high and too fast—but it was followed almost instantly by contact from three other sites. The controller made a rough mental plot from those first few tracks and did not like it at all. He gnawed his thumbnail for about thirty seconds, and by that time the tracks were going

up in plot. The sight decided him. There was no time to be wrong about this, the strangers were closing too fast, better to take a chance on looking silly than to be caught short.

He scrambled everything he had and transmitted a full alert—

On the control deck of the lead ship of the second element, the captain and the task commander of the GS patrol stood watching Earth roll by them fifty miles below.

"We're being tracked," the watch officer said. He did not speak in English, of course, nor in any Earthly tongue. As a matter of fact, he did not speak at all, as we use the term.

The task commander nodded. "Let 'em track. This is task, not reconnaissance. They'll have plenty of reason to know we're here in a few minutes, anyway."

Below, off the starboard bow, a smudge of light marking an airfield suddenly winked out. "Rather effective security they have, at that," he added drudgingly, "considering their technical limitations."

"Coming on first target," the watch officer said.

The task commander glanced at the position plot and stepped over to his station. "Polka Dot Leader, Task Leader," he said, "coming on your target. Advise on execution."

"Polka Dot Leader, Roger," the speaker said, "coming on target." Thirty miles ahead, the first gleaming shape showed gaping holes along its belly as its bays slid open.

"On target," the speaker said.

An orderly array of stubby-winged projectiles drifted leisurely out of her belly.

"All clear, 1319 and a quarter," the speaker said.

"Roger," the task commander said. "Rendezvous." The empty bays of the big silver ship blinked shut and she stuck her nose up and began to climb. Below her, her progeny dipped and swung faster and faster toward Earth, while the remainder of the formation swept past above.

The task commander studied the position plot again. "Polka Dot Two," he said, "coming on your target."

The radar did not at first catch the drop, but when the lead ship left formation and began to climb, the controller smelled death on its way. Without thinking twice, he ordered Bomb Warning A. He had no way of knowing what was coming, but those ships up there were certainly nuclear powered, no chemical engine could drive that high and fast, and whatever they laid would be potent. For himself, and the personnel of plot, there was nothing he could do. They had to stay and keep trying. He did not, he thought somewhat gloomily, even have time to worry about it; at that moment the first tracks on the projectiles began to come through, as they separated from the formation, and he began to be very busy.

There was no use trying for the ships themselves, they went over at five times his interceptors' ceiling and six times their speed, he vectored everything he had in on the extrapolated drop course. Even this was useless, he soon found. As they closed with his fighters, the projectiles suddenly put on power and took evasive action. He had guessed they would, a free drop would hardly be made from that altitude and distance, but confirmation did not make him happy. The first projectile sizzled past the fighters at fifteen hundred miles an hour and streaked for the base—

Strategic Air Command alerted on the first flash, and by the time the GS patrol had made its second drop the heavies were rumbling out onto the runways. They were armed and their eggs snuggled lethally in their bellies, but their pilots did not yet know their targets. Their mission was retaliatory, to get air-borne before the first strike hit them, and to see there were no bases for the enemy to return to. They would get their targets when the enemy was identified.

They never did get them. The first bomber was fifty miles out climbing on course when they got the bad news from their controller. A moment later their own radar picked up the bandit, closing fast from above. The turrets began to swivel, but they were not fast enough, they could not even track the enemy; as he flashed by at two thousand yards something flickered out to touch the big bomber, and it crumpled in on itself and lost speed and began to fall through the night just beginning to be touched by dawn.

The commanding general of SAC himself had observed the action by radar.

"Those weren't bomb-drops," he said. "They were fighter-drops. Fighter-bombers, probably. They'll be here next."

His words were prophetic. They were—

The GS patrol had flown into day, through it, and back into night again, on a course that roughly quartered the globe, by the time the last drop was made. Task Leader and Red Stripe Three pulled up to orbital altitude together and cut power. Polka Dot Leader had already made her pickup and the others were dropping down to do the same, but it would be some time before Red Stripe's parasites completed their missions.

Reports were coming in regularly, it was already obvious that the strike would be completely successful, and the task commander was in a jovial mood. There were losses, of course, even with a ten-to-one superiority in speed and an astronomical edge in armament a planet-wide action against an alert and savagely resistant foe cannot be fought without losses, but they were well within the calculated margin the commander had sent back to base in his preliminary estimate.

He had done a good, workmanlike job, and he knew it. Adequate recognition would come at base, but in the meantime he wanted to explain just how good a job it was, and he could not very well do this to military personnel; they were all below him in rank so he sought out the civilian observer from the Department of Minorities and Backward Peoples.

"How do you like it?" he asked. "Good, fast, clean job, don't you think? All we have to do now is pick up our chicks, seed the inhibitor, and get out."

The Department man was somewhat dazed, he had never seen anything quite like this before. "Well, yes, I suppose so," he said. "How many casualties do you think there will be?"

The task commander pulled at his lip, mentally extrapolating the reported losses. "Not more than twenty," he said confidently, "just over one per cent. Very cheap, really, for a planetary action of this scope."

"No, no," the Department man said impatiently. "I know our own losses are light. The others, I mean, the Terrestrials, how many of those do you think we're killing?"

"Well, I hadn't really tried to guess," the task commander said uneasily. He had not thought of the natives before as people, he was familiar with them, of course, from the years of observation and his briefing; but he had been thinking only in terms of installations to be destroyed.

"I suppose they'll run rather high," he said. "We've tried to avoid nonstrategic targets, but you can't rip the heart out of a heavily militarized planet without killing people. Yes, I suppose their casualties *will* be heavy."

He scratched thoughtfully at his nose. "Um-m-m . . . military crews . . . civilian personnel . . . we're pinpointing our strikes, you understand, but population is so *dense* in some areas, we can't confine fission products, vapors, dusts, and I don't suppose they are at all well protected . . . let's say three or four million, in all."

The Department man stared at him. "Three or four million? Do you suppose the Council knew that when they authorized this raid?"

"Of course they did," the task commander said impatiently. "You have to remember this planet is already heavily overpopulated, well over two billion, it's really bursting at the seams, these people breed like flies. Actually, four million is only two tenths of a per cent, or less, of the total population. A minor famine or epidemic could take that many, the next atomic war could have taken ten or twenty per cent, if we hadn't pulled their teeth.

"It's bad, I'll grant you that," he added hastily, seeing the look on the Department man's face. "Even tragic. But you have to look at things like this rationally, from the long view.

These people have to be controlled for their own good, we can't let them just run loose to slaughter each other and perhaps even destroy the planet.

"With the advanced weapons they had, they were like idiot children playing with machine guns."

The Pentagon was not, in the raiders' operations, a military target. In the midst of disaster and confusion, Intelligence and Communications still functioned, if not smoothly, at least adequately. The basic picture of the raid and its effect began to shape up almost before the last raider had slid up through the atmosphere to join the formation orbiting effortlessly above.

First, there was no longer in any part of the world, so far as careful reconnaissance could determine, any store of fissionable material nor any plant for processing such material. Where these had been were now boiling pits of liquid magma, with the air above and about lethally charged with radioactive debris. Either the raiders had perfect intelligence, or they had instruments able to sniff out the stuff with uncanny precision, in either event they had got them all.

Second, most of the nuclear technicians—and this included the best technical and scientific brains in the world—had gone with their works.

Third, the raiders were extraterrestrial. They had not spared any major nation, and they were too well-armed and well-organized, they did not fit in any Earthly technology.

Whence they had come, and whither gone, no one could say with assurance, but their purpose was clear—to see that men did not again use nuclear energy for either war or peace.

Forty-eight hours later, as the inhibitor settled down from the stratosphere, a secondary interdict became manifest. Men would also no longer use chemical explosives. Above a pressure of two hundred psi, chemical reactions were self-damping. Hydroelectric and steam plants functioned normally, low-compression engines and jets idled without power; but guns fizzled damply and high-compression engines stalled. A ceiling had been put on the compact power available to man.

Attempts were made at censorship, the enormity of the raid's implications were so obvious that the most stringent measures were indicated. Presses and editions were impounded, reporters locked up and even shot, a straight embargo on all nonmilitary long-distance communications was clamped down, security officers sprouted new ulcers and went sleepless. But it was too big, too sudden and unexpected, too spectacular. Even after years of indoctrination and screening and stringent regulation, there were too many poor security risks in the services, too many leaks, too many people who simply refused to understand the necessity for keeping their mouths and minds and eyes

and ears closed in matters of military significance. And in every community there were the loud-mouths and wise-acres who could draw and spread conclusions from the fact that Oak Ridge and Brookhaven and Hanford and Los Alamos were hit, that their automobiles no longer ran, that guns would not shoot.

The news got out.

Men of good will had been talking disarmament for years. Now they had it, a free gift from heaven, somewhat roughly delivered but none the less effective.

After the first shock, thoughtful men everywhere began to consider what it might mean—

"It means," Paul Bonner said, "rescue at the eleventh hour, the Marines have landed, the courier has ridden up with the reprieve." He sipped appreciatively at his second preprandial martini. "These are very good, dear."

His wife, curled at his feet before the fireplace, nodded complacently.

"It means," he continued, "men can relax and live again. Here we were, sitting on a powder magazine, the few sane ones among us at the mercy of the brainless yuts giving each other hotfeet, and now suddenly some watchful intelligence, like a careful parent, has snatched the matches away."

"I'm going to miss our car," his wife sighed.

"I shan't," Bonner said positively. "There were too many cars, too many airplanes, too much speed. Man's machines evolved faster than he. We weren't built to cover miles in split minutes. Now we can slow down and catch up, consolidate our gains, live at a more natural pace, take time to think and really live. I say, it's a cheap price to pay."

And:

"The fact of disarmament itself," Professor Salton wrote in his diary, "is of secondary significance, and must have been adjudged so by the raiders themselves. Had they been chiefly intent on demilitarizing the planet, they would not logically have confined themselves to the targets they chose. The logic of complete demilitarization would have included the dispersal of armies in the field and the destruction of all heavy industry which might contribute to the manufacture of munitions other than chemical and nuclear explosives. It is significant that stores of poison gas and biological warfare centers were not attacked.

"The inference can therefore be drawn that the raiders were socially sophisticated enough, and sufficiently well informed, to recognize the deep imbalance in our culture between the physical and social sciences.

"Their primary concern was to right this imbalance."

The professor turned a page and sat for a moment with poised pen, seeing

not the blank sheet before him, but the panorama of western history, developing in tracings of ever more complex scope from the first few crabbed scribblings of the Sumerians.

"The focus of the main stream of human thought and inquiry," he wrote, "proceeds across the broad canvas of the plenum not in a steady progression, but in complicated pendulumlike sweeps from extreme to extreme—Hegelian thesis and antithesis, except that the final result is never a simple balancing, the synthesis results rather from the shading in of all areas between the opposite poles of thought until the distinction is lost and it all becomes one. This pendulum has multi-dimensional articulation, so that the trace is never a simple linear function, it never covers exactly the same area twice. Its movement is a complex function of all the things men have known or thought about since the beginning of time.

"The European Renaissance came as a reaction to the sterile perfectionism of Augustinian idealism. Because its impetus derived from an extreme of preoccupation with human behavior and morals, it not only swung wildly to the opposite extreme of rigidly objective experimentalism, but it spent its major force in the field of physical science. This was no accident, it was an inevitable outgrowth of the spirit of the times and the antecedents of our culture.

"We have now worked around the periphery of physical knowledge till we have again reached the pole of intuitive rationalism, where the universe melts into a confusing amorphism only scholars can feel at home in. Men of inquiring and independent minds must inevitably recoil into a simpler atmosphere where sight and touch again have meaning.

"The next swing should have directed us back to a concern with human motivation and activity.

"There were several indications that this trend was indeed developing.

"Men were wondering seriously why they thought like men, in a world engineered for the comfort of their animal bodies; as five hundred years earlier they had wondered why men had bodies, if only the soul were important. The development of the physical sciences had subtly loosened the hold of superstition on the minds of men, so that if they were unwilling to follow, they at least tolerated, students who classified the cherished opinions of themselves and others as phenomena in the physical universe, and called all the physical universe a valid field for objective inquiry. Scattered engineers and clinicians here and there were beginning to establish functional relations between pride and pay scales, human fellowship and production records, social status and sexual mores. The alchemistic mind-doctors were seeking the philosopher's stone which would transmute the dross of our individual foibles into shining

gold—but stumbling here and there on factual discoveries scientists might later turn to good account. Perhaps Korzybski had written the 'Novum Organum' of a new Renaissance. And the germs of new mathematics that could handle the manifold variables were sprouting. The time was ready for a Newton.

"But it came too late. It needed fifty or a hundred years to get its growth, and with the helium bomb the world no longer had that time left.

"So the Raiders came. In effect, they moved the clock of our conquest of the physical world back a hundred years. Before they came, we had passed the peak of the gasoline age and were moving into the atomic age. When they left, we were back in the age of steam.

"Undoubtedly, in the years to come, men will again discover energy sources as powerful as those they lost, but it will take time, perhaps not as long as the original hundred years, but still a breathing spell. And in that time the science of human behavior will have its chance. By the time we are ready to fly to the stars again, or have the power to blast whole armies out of existence, we will have means of controlling ourselves so that this power is used with cunning foresight for the good of man, rather than suicidally, like an idiot child playing with a machine gun.

"This is the best thing that could have happened to men."

And:

A writer who had dedicated the best years of his life to a crusade against the pointless stupidities and petty unthinking cruelties of his fellowmen, at two bits a word, was putting the finishing touches on a rush article.

"Pride," he wrote, "goeth before a fall—and men who thought they had tamed all nature, and were looking for new worlds to loot in the stars, have suddenly learned they have a master. The simple-minded barbarians who strutted valorously with the power of thousands of horses at their command have seen their most prized works crumble like sand castles before the tide.

"It was a lesson men sorely needed, the simple lesson of humility.

"In my own mind, for the first time since Hiroshima, is peace and good will and comfortable assurance that me and mine will live out our normal span in a world of men chastened and rendered less cocksure by this experience.

"I say, God bless the raiders—"

There were, of course, some who were not quite so sure—

On a hillside in Asia some two months after the raiders had come, Sergeant Albert Baker sat in the bright summer sun watching through glasses the mouth of a low pass. A cloud of dust rose there which came quickly down into the valley. Sparkles

of light from burnished lance-tips flashed from the cloud. A Mongol swordsman with horsetails tied to his cap cantered out ahead and reined up to look around.

Baker's lips drew back in a snarl. This was the enemy. To them, the inhibitor had meant nothing. They threw their guns away, sharpened their lances, and whooped down upon the gun crews, tankers, and machine-gunners who clubbed useless carbines and threw rocks. The first few weeks had been massacre. After that the Americans recovered somewhat from their shock, began to reorganize and pick up edged weapons, to fight their way back to the sea. They were outnumbered and outmaneuvered, they could not in a few days learn a type of warfare devoid of firepower and mechanized supply, and the retreat was mostly a rout.

During that time, only men who moved fast and learned quickly survived. Baker was only nineteen, but he had come all the way, in this fighting he was an old hand, a veteran who knew all the tricks. He could hardly remember what it felt like to ride in a truck, sleep on a full belly, or command weapons that killed in great bursts of flame or sleets of lead. The tools he knew were knife and spear, arbalest and sword. His enemy was not a plane or a tank, it was the flat-faced horseman with sword or lance.

The Americans now stood with their backs to the sea, waiting for evacuation complicated by lack of Diesel- or gasoline-powered landing craft. Their situation was not bad, really, there were not very many of them left to evacuate, most were dead in the hills and plains of the interior; and to some extent supply had caught up with them here, they ate more often and they had a weapon to at least harass the horsemen.

The leading squadrons were well into the valley now, the point abreast of Baker. He moved his magneto box around between his knees and squatted over it, his glasses on the man standing on a spiny ridge at the lower end of the valley. Presently the man signaled, and Baker pressed the plunger. In the valley below, a thin vapor began to creep out from all sides toward the horsemen in the center. Baker carefully checked his sector with his glasses. All cylinders had fired—they almost had to, poison gas was cheap in the United States but dear here where the cylinders were brought up on men's backs, and they had been spread thin.

"All right," he said finally, "let's get out of here before those gooks spot us."

His men needed no urging, they had been uncomfortably aware of their exposed position for some time. They picked up their weapons and moved off at a swift walk along the hillside. There was a small gully they must cross, and here they donned masks before they scrambled down. The

bank on the other side was steep, they needed to boost each other up to make it, and they were not all up when half a troop of the enemy, red-eyed and wheezing, came stampeding up out of the valley at them.

Baker saw them coming only a few hundred yards away, with his little force split, half on the bank and half below. He dropped his arbalest to cock it and shouted a warning.

There were three pikes in the party, twelve-foot shafts with heavy, wicked points of razor-ground steel armor scrap. The men had been using these to climb the bank, they snatched them away now and swung out to set them with drilled precision. The other men in the gully had captured swords and bayoneted M-1's, except for Baker and one other with arbalests of jeep spring-leaves and airplane cable mounted on M-1 stocks. One man, a swordsman, was hanging on the edge of the bank by his elbows, on the verge of hoisting himself over, he twisted his head to look over his shoulder, hesitated a moment, and then slid back down to join them. Baker was glad to see him come, there was another arbalest on the bank, that was a good place for him, but the swordsmen and spearmen up there were useless. Still he could not order them back down, this looked like a death trap. Their left flank anchored on the bank, but their right hung in the air, he grabbed two spearmen and swung them around to give some protection, but there were just not enough of them to cover it adequately. He and the other arbalestier stepped in behind the pikemen and spearmen, who had dropped to their knees, and Baker slipped in a quarrel.

The enemy point swerved in at them, settling his lance, and at five yards Baker shot the horse in the throat. The other arbalestier took the second. A swordsman flashed by on the right and swung viciously at Baker, who parried with the stock of his weapon. At the same moment, from the corner of his eye he saw a horse caught on two of the pikes and one of his spearmen leaping out, yelling, over the pikemen and struggling horses to bayonet its rider. After that there was only dust and confusion and flashing steel and yelling men, and then sudden quiet. It took some minutes for Baker to realize the clash was over and he still alive—actually the enemy had not been anxious to press their charge home or turn his flank, they had only been trying to get out of the valley as quickly as possible and the platoon had been in the way.

Still, it had not been fun, the brief flurry had cost them men. Baker cursed the enemy and the raiders both, thinking how much difference even one stinking Browning would have made—

After twenty years, the inhibitor against high-pressure chemical reaction lost its effectiveness and needed

to be re-seeded. It was a routine task for one cruiser, there was no real reason for the former task commander, now deputy fleet admiral, to go along. At the moment, however, things were quiet and Galactic Security labored under an economy budget. The admiral needed the flight-time, and besides he was curious. He held a peculiar affection for Earth, the action of twenty years before had been his first independent task command, and still stood in his mind as a perfectly planned and executed job.

The civilian observer from the Department of Minorities and Backward Peoples went along because the Department wanted a check and he had asked for the assignment. He, too, was curious, this had been an unorthodox and controversial experiment from the start, and he was still unconvinced of its overall desirability.

They came in over the pole on almost the same course they had flown twenty years before, and the admiral was first to notice the change.

"No radar," he said, watching the instruments.

Where before a whole continent had quivered and reacted with alert savagery to their appearance, they now coasted alone through the bright sky, apparently unheeded and unknown to men. It made the admiral vaguely uneasy.

The seeding was to be done at two hundred thousand, in a crisscross pattern which would take several hours, and the Department observer wanted to go down in the tender and make some checks at a lower altitude. The admiral decided to go with him.

They glided down to five thousand feet before applying power, careless of who might see the disk-shaped flier drifting overhead; there was no particular reason to avoid observation now, this planet had already known them.

Over the northern United States, there was superficially little change, the admiral had little difficulty in orienting himself by the photo-charts made more than twenty years before, railroads and highways still cut in straight lines across the plains checkerboarded by wheatfields. Not till they came over the lakes region did they begin to notice significant differences. Here, small villages spotted crossroads where they had not appeared on the old charts, and cities had shrunk and drawn in upon themselves. Once again, the United States was a predominantly rural nation.

In the days immediately after the raid, there had been little change in those cities not directly affected. There were deaths from radiation sickness and poisoning as the debris of the raid sifted through the atmosphere, and film badges and gas masks became a part of the everyday costume of those who could afford them; automobiles rusted where they stood and there were minor inconveniences; but the streetcars still ran, electric signs


ORBAN

flashed, and the plumbing worked. In those first days, aside from the blasted areas, the farms and suburbs were hardest hit. Life there had tied itself tightly to the internal-combustion engine, to tractors and trucks and aircraft and Diesel engines.

There were not very many crops planted or harvested in North America that year.

As summer wore on, the cities also began to feel the pinch. Distribution was difficult without trucks, highlands and reservoirs needed helicopters and power boats for maintenance. Prices rose and inconveniences multiplied.

By fall, in the poorer sections, people were starving.

By the next spring, the population of the United States was less than sixty million and the machinery of civilization rusted unattended while people scrabbled for food. The bones of Paul Bonner and his pretty wife lay in a roadside ditch, with spring rains melting the ice and flesh from them.

That summer was bad too, but the seeds of resurgence were sprouting. The federal gold hoard came out of its vaults to buy food men would not sell for paper, and when the hard yellow coin began to circulate people forgot their despair and their wits sharpened and they looked about for opportunity. Old stern-wheelers slid off the banks and creaked out of sloughs to push tons of Argentine beef and horses and grain up the inland waters from New Orleans. Independent train crews hauled loads for speculators out from St. Louis and Cincinnati and Kansas City. People drifted back to the cities to build steam tractors.

In another year the trains were running on schedules of a sort and a few turbine-powered automobiles and trucks were on the highways.

Five years after the raid, the country was back on its feet, but it was not the same country. Cultures, like individuals, discard patterns of behavior associated with defeat and cherish jealously those associated with gratification. The trauma of sudden almost mortal disaster is apt to intensify these reactions to the point of mania.

From five thousand feet, the country now looked green and prosperous, even the scars of Brookhaven were growing over. The admiral studied the peacefully pastoral scene, the bustling but not overcrowded cities, with approval.

From five thousand feet, he could not see the scavenger-gnawed skeletons still tangled in obscure briarpatches, nor the scars and bitterness and hatred still tangled in people's hearts. If he saw, he did not particularly note the little groups of hard-faced observers here and there who studied his craft through binoculars and carefully filmed its every move.

The Department observer could not see them either, but he was better versed in social phenomena than the military man, and he was not so sure.

"Let's see what Europe looks like," he said.

In Asia, after the debacle, the Americans evacuated about twelve thousand troops to Japan. Most of these, being veteran and reliable, were brought back to restore order when the domestic military establishment fell apart. Now again there were detachments in the Philippines and the Pacific Islands, and in Malaya to protect the growing rubber demand, but the mainland of Asia was left to the warlords and khans.

In Europe, defeat had not been so disastrous. The enemy there were almost as heavily mechanized as the NATO nations, and as discomfitted to find themselves suddenly disarmed. Also, they experienced internal troubles from those of their own peoples who had never taken kindly to statism. These troubles were compounded by the fact that the dissident elements were mainly just those who clung to and were most adept with yataghan and knife, bow and lance, horse and camel; many a Muscovite commissar fumbled uselessly with his pistol while Finnish knife or Montenegrin dagger or Ukrainian scythe bit into him.

Still, the enemy had numbers, and under the urge of famine he swept across Europe, looting and burning and killing to the Rhine, sending isolated raiding parties as far as the Pyrenees, then decomposed from internal stresses. His troops frittered away and disappeared, but Europe lacked the energy to recover. When the first great wave of horsemen from the steppes came, the only organized opposition they met was from the scattered American garrisons along the Rhine, and they foraged to the channel, so that in middle Europe hardly stone stood on stone and one might go for miles without seeing a living man.

Here, the admiral could see the skulls even from the air. In Potsdamer-Platz, they were piled in the neat Asiatic habit into a pyramid over fifty feet high.

They swung back across Bavaria then, and along the Rhine, staring wordlessly at the desolation below, livened only by the occasional disorderly gaggle of squat dark riders with their trains of loot. The admiral tugged uneasily at his collar and glanced sidelong at the civilian, but the latter said nothing, and then the admiral suddenly brightened. Away across the Rhine his trained eye had caught a hint of order, a flash of steel. He tapped the pilot's arm and pointed, and they swung down over a marching column of men, coming with burnished arms and steady step and even formation along a highway to cut behind a swarm of the savages.

Colonel Albert Baker pulled his horse off to the side and reined around to watch his regiment come up into the battle-line. They were rugged

and tough, veterans with a sprinkling of husky recruits from midwestern prairies and Norman farms and Scotch hills, the fastest marching infantry since Grant's, and, with allowances for fire-power, perhaps the deadliest. Still, this was the time they were vulnerable, the next few minutes while they maneuvered directly from the column of march into the line. The colonel did not like it, but he was working on Evaluation's clockwork schedule, and there was nothing much he could do about it. The forward elements of his flanking archers began to drift out onto the plain, and he debated whether to throw them forward as a screen, slowing down his disposition but making a tactically sounder maneuver. Just then a squadron of dragoons jingled past at a trot, and he breathed easier. Corps had promised the cavalry screen, but he distrusted cavalry, they were always skittering off somewhere else when you needed them most, and he had not really believed they would show up.

The 103rd was next in the line, his right flank would rest on them, and he watched now as they moved into position smartly. When they were clear the colonel raised his hand, bugles screamed, and with drums beating to set the step his regiment swung out onto the plain and up into line. Standard-bearers ran forward and dressed and set guidons, squads and companies wheeled and marked time and countermarched, dust rose and swirled in choking clouds, lieutenants and sergeants back-pedaled anxiously and shouted hoarse commands and blew on whistles. The pattern began to fill in. Lines grew out of seeming chaos and weaved back and forth, dressing, and then the regiment was blocked solidly in its place, left flank on the river and right on the 103rd. The colonel eased himself in his saddle and lit a cigar, turning to survey the field as a whole.

For the first time since he had got his orders, he began to see how the battle would shape up. They had cut the hordes off from their train, he saw, far down the valley in his rear women and children, cook fires and wagons and pack animals tangled in a frightened mess. The enemy were strung up the valley, sucked up there probably by skirmishing cavalry, but pausing now to look back at the infantry who had come in behind them. It had been a tricky maneuver, but it had worked, and the enemy now must either fight or run. They would fight, the colonel knew, the horsemen would never leave their women and loot without a battle. He waited with cold confidence, knowing the light cavalry did not exist that could break a division of drilled heavy infantry solidly anchored with protected flanks.

He eased his right leg and studied his own men again. They were at ease now, their places marked by their weapons, some sitting, smoking or

chewing field rations, breathing easy and in good shape. To their rear there was a sudden clatter as the batteries of steam centrifugals and mortars galloped up. Must be about time for things to start, the colonel thought sourly, it would be a miracle if artillery was actually spaded in and fired up by the time action joined. He trotted slowly back to his command post and joined his staff.

The horde made up its mind, bunched and began to drift back down the valley. Half a dozen blimps came up over the hills to the right and scattered napalm and spreading blobs of gas on the enemy, and suddenly they picked up speed and started coming like an avalanche, spread out over a half mile front, a wall of dust two hundred feet high surging along with them. The infantry were on their feet now, nervously stamping out butts, opening lanes for the dragoons to stream back through. Behind, there was a whine as the turbine-driven centrifugals came up to speed.

Baker spoke to his bugler. The bugle sang and the lines stiffened and solidified. Company officers ran back and forth dressing the front, and then suddenly the pikemen dropped and set their pikes and raised their shields. What had been an orderly array of men in infantry blue battle dress was now a solid line of glittering steel, reaching from river to cliffs on the far side, backed solidly by the lines of archers and swordsmen, file closers and mobile reserve, a heavy infantry division in line of battle. It made a grim, imposing sight. In the unnoticed flier overhead, the admiral almost fell out of his seat in his excitement, the fighting he knew was nothing like this, but he liked it.

The colonel was alert but unimpressed, he had seen it many times before, and he knew the rest would not be so pretty. He gauged the distance to the enemy, and spoke to his bugler again. The archers stepped out between the pikes and took their stand, leisurely setting their arrows in the ground in preparation for rapid fire. They were the elite, a pikeman or arbalestier could be trained in a few months but an archer needed to grow up with a longbow in his hands to use it effectively, and the colonel guarded them jealously, not because he loved them but because he couldn't get along without them. He wondered now, as he had often before, if the arbalest would ever be technically improved to the point of being a completely satisfactory missile weapon for light infantry.

The first ranks of oncoming horsemen were five hundred yards out now, and the mortars popped for the first time and sent a flood of lazy bombs arching overhead to burst and spread blazing napalm. The shouts of officers calling the range came dimly above the general racket, and then the first volley from the archers rose and fell in

a cloud and slugs from the centrifugals began to whistle overhead, playing like hydraulic blasts on the onrushing enemy, eroding them away in patches and swathes. The archers were firing at will now, the air was solid with their shafts, it seemed impossible that horse or man could come through that hail and the sickening *plop* of the firebombs. Still they came, and there rose an answering swarm of arrows from their short stiff bows to rattle on the infantry's upraised shields. The archers skipped nimbly back into their ranks, and from between the now unobscured pikes the flame-throwers spat clouds and flame.

On Baker's front, the enemy broke, they dashed up against the pikes and recoiled, unable to force the flaming wall with its sharp steel core. Neither could they turn and face the gas cloud rolling threateningly in their rear, they raced in tangled streams back and forth parallel to the front, seeking a weak spot, while arbalestiers and centrifugals and flame-throwers poured fire relentlessly into them.

The 103rd was not having such good luck. Their front was broken in two places, and one serious melee developed into a momentary break-through. Baker alerted part of his reserve to help if necessary, but they closed up without aid and the cavalry in the rear finished off the few enemy who did come through.

The battle was over now, the rest slaughter. Baker turned his attention again to his own front, watching with cold appreciation the death his regiment was dealing.

The enemy was seeking only escape. Some tried to swim the river, where Baker's archers picked them off at leisure. Some scrambled up the cliffs on the other side, where they made equally good targets, and some drove recklessly back into the gas cloud to strangle. Very few got away. The mass thinned, and then there were only isolated riders racing madly past, and then nothing but a slowly settling cloud of dust, with an occasional limping figure drawing a flurry of fire, riderless horses stampeding aimlessly.

Baker looked at his watch. It was somewhat under two hours since he had ordered his men into action; less than two hours to annihilate a dozen hordes that had harried whole provinces for years—a good day's work.

The admiral settled back into his seat and drew a deep breath.

"Well," he said somewhat inadequately, "I'm afraid we didn't do such a good job of stopping war on *this* planet."

"We certainly lowered the population level that was worrying you Malthusians, though," the observer said. "That little tiff down there," he waved his hand, "must have helped by five or six thousand."

He rubbed wearily at his face. "No, it's no good," he said heavily. "We never should have permitted this experiment. You shoot-em-up boys are

always too anxious to civilize people by gunfire. I am going to recommend that the Department question Security's stand in this matter at the next Council meeting, and urge we review the whole history of our contact with these people. It may not be too late to do something constructive yet."

"Now wait a minute," the admiral said stubbornly. "This may not have gone just according to plan, but it wasn't our plan, you long-hairs were the people who developed this theory that if we could block off the natives' physical expansion they'd be forced to develop a peaceful civilization, all Security did was to implement that plan. And there is *some* improvement. They may still be killing each other, but at least they aren't using mass weapons any more, it's man to man, between warriors. They aren't blowing up whole cities, women and children, the sick and peaceful along with the belligerent—"

The stretcher-bearers were working through the ranks now, picking up the dead and wounded, but they did not bother with the enemy. The dragoons were taking care of them. They were out front again, picking their way gingerly between the burning areas where the bombs had dropped, thrusting and hacking here and there as they found wounded, catching horses, dismounting to pick up an especially interesting bit of loot.

Let them have it, the colonel thought, what he wanted was the wagon train in the rear. There would be the real loot, women and stores and gold and all the stripped wealth of this land fine-combed again and again by the raiders. The colonel fought for his rank and his retirement and vaguer, higher, imponderables he felt but could not have put a name too, but his men fought for loot. There was no rotation in this army, only death or crippling wounds, retirement perhaps for a few who were lucky, at the end of a hard life of constant battle. They needed the occasional fierce satisfactions of stolen women, looted gold and wine, unopposed slaughter and destruction, to balance the hard discipline of their daily life. The colonel knew this, he did not begrudge them their fun, although for disciplinary reasons he liked to take his in quieter form. So now he sat, forgetting the battle already, estimating his chances, plotting cunningly how his regiment should be first to fall upon the camp.

He suddenly noticed some of the men looking up, and pointing, and he, too, looked up and for the first time saw the Galactic observation flier, hanging motionless over the battlefield. His mind went back twenty years, to the gully in Korea, to the hundred thousand men who had left their bones to whiten in that retreat, to his mother and father and brothers and sisters, who had lived near Oak Ridge before the raiders came, in an

area still posted as radioactive.

He studied the flier carefully.

"You, too, boy," he thought, "Just wait a while, we'll get to you yet, we haven't forgotten—"

Professor Salton was writing in his diary—

"In retrospect," he wrote, "it is obvious that the effect of the raiders upon Terrestrial development was much more complex than at first appeared. They halted the explosive burgeoning of physical power available to man, and forced him to direct his energies in other directions. They gave man time and impetus to develop the social sciences he had forgotten in the sudden unfolding of physical power. But they altered his basic orientation.

"Before the raid, men lived in a world in which they were supreme, and had only each other to fear. The abrupt brutality of the raid, emphasized by its aftermath of famine and disruption, sharply reminded them that they were small fry in a shark-swarming, hostile universe, apt at any moment to be gulped up.

"Five hundred years earlier, they might have withdrawn into a shell of protective humility and prayer. A hundred years later, they might have understood the workings of their own minds well enough to preserve a balance. As it was, they reacted instinctively, but in the pattern of an aggressive culture, aggressively.

"Since physical science had failed them, they cast it aside and snatched up the newer, subtler tools of thought and life. The new learning that might have taught men to live with each other was ground and sharpened for hostile uses.

"The millennium of peace, which seemed so close, has again been postponed—"

And:

"Colonel Baker," the general said, "I'd like you to meet Major Pellati. He's the man who set up your targets for you this afternoon, the chief of our corps evaluation staff."

"Well, you did a good job on that, major," the colonel said. "Everything folded together like a peddler's pack. I don't think a hundred of those devils got away."

"We didn't intend for very many to get away." The major looked around distastefully. "You like this racket?" he asked abruptly.

It *was* somewhat noisy. Division headquarters had been set up in an old building, a monolithic concrete relic of the atomic age, as indestructible without explosives as a mountain, and the junior officers had promptly organized a party. They had liberated a varied assortment of women and alcoholic beverages from the enemy camp and rounded up parts of three regimental bands, and the party was going strong.

At one end of the plank bar twenty company officers were harmonizing

"Dinah," at the other end a small party of their seniors were rounding up candidates, amid shrieks of girlish laughter, to decorate with lipsticked kisses the shining bald head of the 103rd's colonel—who had gone to sleep, as was his habit, after the fifth drink. Half the band were following Baker's band leader in the "Tennessee Waltz" while the other half played something unidentifiable but certainly not the "Tennessee Waltz." As a finishing touch, three Marine observers within armlength of Baker and Pellati were defiantly bellowing "Zamboanga." It was quite a party.

"Why, yes," Baker said, "it is a little noisy."

With common consent, they picked up a bottle of Calvados from the bar and sought quieter surroundings. "Oops," Pellati said at the first door they tried and backed hurriedly out. "Occupied," he said briefly. They wandered down a long hall and found an alcove housing an ex-window, now ventilated agreeably by the fresh evening air. They sat down on the window ledge with the bottle between them.

"Yes, sir, that was a nice action," Baker said. Something that had been lurking in the back of his mind all day came to the fore. "Were you in Korea?" he asked.

"I was at Inchon. That's where we first used von Neumann's mathematics to evaluate a large-scale operation. Worked pretty good."

"That was before my time. I got there just in time to be right in the middle when the raid hit and the gooks climbed all over us. That's what I was thinking about; this afternoon, I was thinking, 'Boy, I'll bet this learns you buggers a good lesson, I've been saving this twenty years for you.'"

He sucked gently at the bottle. "Did you say you were in Evaluation at Inchon?" he asked suddenly. "Didn't know they had anything like that then."

"Well, it was pretty crude stuff," the major said. "Experimental. Half mathematics and half good guessing."

"It still looks like magic to me."

"It isn't. Tactics isn't an art any more, or even science. It's just engineering. If your intelligence is good, and you know what you've got to work with, all you have to do is work up the equations. With those savages we were fighting today, you don't even have to make allowances for independent thought, they don't think, just react like machines. Once you know the basic pattern of that reaction, you can just about predict every move they'll make for the next six months. Then it's just a question of being in the right place at the right time."

"Did you see that raider flier this afternoon?" he asked abruptly.

Baker nodded.

"Those are the ones we'll have to sweat for," the major said.

"Well," Baker said piously, "I hope

to live to see the day, but I don't know; they've got a pretty big edge on us in weapons—"

"Weapons don't mean a thing, colonel. Disparity in armament is simply one of the factors to which we assign weights in the tactical and strategic equations." He took a cigar from his pocket and lit it carefully, staring cross-eyed down his long nose.

"Twenty years ago, we put *our* faith in gadgets—radar and guns and engines and nuclear explosives—and you remember what happened. We learned our lesson. There's always somebody with bigger and better stuff. So now we learn to use what we do have with maximum effect, and stick to simple weapons we know won't fail us. Our hole card is the infantryman walking on his own two legs with good solid steel in his hands.

"We can't lose, because we don't depend on tools, we depend on knowing what *people* are going to do with tools, and adapt our own action to the circumstances. With the Latin-Americans we used a combination of force and economic and moral action. With the British, we used economic and

political means. With these gooks, we use force at the moment, it's cheaper to kill them than to educate them. I don't know just what we'll use with the Raiders, but we'll take them, don't ever doubt that, all in good time, after we've cleaned our own house and have this planet organized.

"I worked on the initial evaluation, right after the raid, we had plenty of material to work up, and we learned enough even then to show they had weaknesses. Our biggest unit is still working on it, every time somebody comes up with a new refinement they work it down a little finer, every time we get new data it goes into the mill. The pictures we got of that fellow this afternoon are on the way back already. That's what we want now, little things, which side the pilot sits on, what part of the battle interested them, anything to fill in the picture.

"Some day, they'll land, get close enough for us to get our hands on them, and we'll be ready for them."

The major took the cigar out of his mouth and spat.

The watch chief socio-technician was monitoring reports by radio-fax, television, and voice; and keeping up a running fire of commentary for the evaluators and calculators who were screening the material and feeding it into the machines.

"Raider landing as predicted," he said, "near major urban center—Chicago. Bless *Bess*, what a ship, big as the *Queen Mary*—"

Machines clicked and chattered and hummed smoothly.

"Plan Sugar-fourteen, modification three on basis current information, just initiated."

"Somebody's dragging their feet," one of the calculators said. "I just cranked out modification five, and mod-4 was acknowledged by Field control at 2113."

"Log it," the watch chief advised. "They'll try to bounce it on us, they're always wrong but they keep hoping."

"Mod-4 coming up," he added. "Only three and a half minutes late, they're outdoing themselves today. That's old Fatso running to the ship instead of walking—Which stupid knothead took my coffee cup?"

On a balcony overlooking the control center, the commanding officer was explaining the operation to some high brass.

"Well, I can see you have a nice operation here," a general said. "Very smooth. But what I don't understand is how you Evaluation people are so sure the Raiders don't have something equivalent to our own Strategic and Tactical Evaluation. If they do, what are we going to do then?"

"They can't have," the CO said positively. "Remember, we've been evaluating these people for fifty years.

"In order to have STE, you have to have a basic science of human mo-

tivation. And they don't have it. The Raid itself is our basic evidence for that. There's no indication that they had anything whatever to gain from the raid, they did it to save us from self-destruction.

"A race that can destroy half a planet's population, forcibly impose its will on an alien race, not for the legitimate aim of self-preservation but because it wants to play God, can't possibly understand even the first rudiments of social control. That type of thinking is authoritarian, symptomatic of egotistic atomism.

"No, we'll take them all right. We have to. The universe isn't safe with people like that running loose, living in an insane world of subjective surrealism, but acting on men who live and die in the real world of objective events.

"They're like idiot children playing with a machine gun."

THE END

THE ANALYTICAL LABORATORY

It appears that you tend to agree with M. C. Pease that humanity could do worse, even if it isn't doing too good a job on getting along with itself. There was the usual scattering of votes, but—this was the August issue, and my request for votes on the articles appeared in the September issue—very few comments on the articles. The article comments are just beginning to come in now, as we close the August issue votes.

Any effort to make a coherent pattern from the votes on one issue is, as a matter of fact, quite useless. That first line comment is interesting, but only by looking at the long-term trends of what gets voted first place can I have any hope of predicting what sort of yarn you'll want for the January issue. And the January 1954 issue. *Et seq.* But there are long-term trends; that's why the Lab is important to me, and why your votes are useful.

Here's the August issue score.

Place	*Story*	*Author*	*Points*
1.	Love Thy Neighbor	M. C. Pease	2.05
2.	The Face of the Enemy	Thomas Wilson	2.41
3.	Cold Awakening	Walter M. Miller, Jr.	2.76
4.	The Conqueror	Mark Clifton	3.76
5.	No Place Like Home	Lester del Rey	4.00

THE EDITOR.

THE THINGS TO COME

BY GENE L. HENDERSON

***For the** information of those who don't know the publishing business, an editor very frequently never meets an author. For instance, I've never met Mr. Henderson. . . .*

Despite the intriguing sound of glasses tinkling from the kitchen, Wade examined his surroundings with no little curiosity. The spacious living room shone with a military neatness that matched his own trim navy uniform. Suddenly feeling the unnecessary warmth of the wool coat, he took it off and carefully folded it across the back of a straight chair.

He made his way to a large table, its cracked, painted surface not only out

Illustrated by van Dongen

of place in the room but also the contents on top—all types of magazines and books, many of the former in lurid covers.

"Why so quiet?" yelled the voice of Cap Parker from the kitchen. "Here I've been buried for weeks and planned on hearing all of the latest scuttlebutt when you arrived." His good-natured voice broke off as he entered the room, a tall glass in each hand. His pudgy face went blank for a moment, then he grinned.

"Don't tell me you're studying for lieutenant commander already," he chided. "Here, take this."

Wade took the glass and sipped appreciatively for a moment, reveling in the welcome coolness after the searing heat of the desert outside.

"Quite some shack the Defense Department squandered on you," he commented. He tried to cover up his puzzlement with light tones but flushed at the mocking grin on his friend's face. "All right," he admitted, "I'll grant you that I've been wondering why my orders should read to report to you instead of an activity. I didn't even have time to grab my khakies."

"You can borrow some of mine until yours catch up with you," offered the rotund and short Cap merrily.

"Ha!" was Wade's only reference to his own stocky over-six-foot body. "You still haven't answered my question."

"That's easy enough. I asked for you."

"Oh, sure. For some reason you get paid high for laying around in the desert and reading that stuff over there." He pointed contemptuously at the table load of magazines, one in particular making him squirm uneasily as it portrayed an utterly impossible creature chasing a frightened but beautiful and scantily-clad girl.

"Don't tell me you've outgrown that college-day liking for science fiction?"

"Well . . . maybe not completely but I've not had time for it and the brass hasn't seen fit to pay me twice a month to indulge myself during work hours."

"You'll get plenty of time for it here. In fact, it'll be part of your duties and expected of you." Cap still grinned, but a slight wrinkle and war gleam shone from his eyes and reminded Wade of many another person who had been deceived by the deceptive good nature and seemingly soft body of his friend. The words soaked in finally and he set the glass down slowly before exclaiming:

"You mean my assignment is to sit around and just read fiction?" he demanded.

"At first, perhaps," admitted Cap, "but it's not going to be just that easy. Been keeping up on the stuff lately?"

"No-o-o, like I said—"

"All right, all right," impatiently, "we've been over that before." At the impatient tones coming so unexpectedly from Cap, Wade flushed and

stiffened. His friend caught the movement instantly and relaxed, coming over to lay a conciliatory hand on Wade's shoulder.

"I'm sorry," he apologized. "It's just that the project has almost made me start seeing the BEM's I've been reading up on." Wade started to speak but Cap held up a hand for silence, his quick smile taking any possible sting out of the gesture.

"Just a moment and I'll give you a quick sketch since we've got to work fast. Have you read enough to know about the new reactor the navy's going to start using for power in some of our newer subs?"

"Sure," enthusiastically. "Here we'd all thought it was several years away yet, then they spring it on the public."

"'They', yes, and our job is to find out whom 'They' might happen to be."

"I don't get it. I thought the labs were working on it from scratch."

"That's right. Just a moment and I'll show you something." He went to the table and rummaged around until he found a magazine. It fell open at a spot that seemed to denote it had been opened at that place many times previously. He held it out to Wade, instructing,

"Here, skim through that as quickly as you can while I mix up a couple more."

Wade frowned but complied. In spite of himself, he became engrossed and finally, at the end, looked up to find Cap sitting across from him, moodily inspecting the ceiling.

"I thought the reactor was top-secret stuff," Wade said, in answer to the raised eyebrows of the other. "It's described so well here that I could almost build one myself if I had the technical training."

"That's right."

"Then another country could do the same thing if they happen to run across the story?"

"Score another one."

"Then where was the leak, how did the author get the info?"

"Look at the date of the magazine." Wade did so, then looked up incredulously.

"But that can't be right," he protested. "This story was printed almost a year before the reactor was brought out."

"Bright boy. Someone on the project read the story several months ago and thought all of the theory was faked. Just for fun he tried it out. We'd still be trying to build a reactor, but for him."

"Now don't tell me that—"

"That's exactly what I'm telling you. The author was way ahead of our researchers, even with a couple of tough formulas."

"Then it seems as if—"

Again he was forestalled as Cap grinned wryly and said, "I know. Drag in the writer and find out how he knew so much, that part was easy.

The story was handled by an agent and came to him from some little mountain town. We checked there and no one had heard of anyone by that name. There didn't even appear to be anyone in town who could do more than write his own name, let alone do a lot of fiction writing, so a pen name is out. We even checked with the one druggist in town and he's never been able to sell one of what he calls 'them there fairy tales.' So, it hardly seems possible that anyone's writing stuff like that in the town when he doesn't even read it."

Wade looked at the stack of magazines with renewed interest. "Are there any more items like that?" he wanted to know.

"Some. I've got them all marked if you'd like to brush over them while I'm fixing up something to eat. Save more time than if we went down to the cafeteria. This is one of the most heavily-guarded research centers in the country and we'd probably have to explain your presence to a dozen or more guards. They know all of the permanent duty personnel by sight. They've been mighty touchy since all of this broke out in official circles. Lucky the public hasn't got onto it yet."

The next few hours passed quickly and, so absorbed had Wade become in the stories Cap had designated with red pencil, that he looked unbelievingly at his watch when Cap called.

"Couldn't wait any longer," explained his friend. "Chow was getting cold."

Once the big edge of his appetite had been worn off, Wade asked, "Are you sure that all of the gadgets in those stories are actually in the labs now?"

"Positive, why?"

"Some of them sound pretty fantastic."

Cap shrugged. "Funny part of it is we were already working on them but were stumped until the stories came out. That seems to be part of the pattern. Anything we're working on, a story seems to come out with the solution but no new ideas. Once or twice we thought the rule had been broken but Intelligence found out later that some other country had been working on it. Also, none of the projects were intended primarily for weapons, just stuff that could be used in industry; although, of course, the reactor will be used in warships."

"Then sending for me doesn't make sense. It sounds as if the ground's already been gone over pretty thoroughly."

"By straight sleuthing, yes, but we have to go deeper than that now. They dumped it in my lap with a blank check for money and personnel and I remembered how well we used to work together in college. Also, that you had a pretty analytical mind which is to be the new phase of operation—analysis. I think if we study all

of this stuff over and over, there might be a point that reoccurs that'll give us a clue either to whom is doing the writing or where it's actually being done. Oh yes, did you notice one other fact about the stories that seemed to hold true in all of them? Besides the science, I mean?"

Wade thought intently and finally shook his head. "Afraid you've got me there, although there were a lot of BEM's in all of them. Nothing unusual in that, though."

Cap grinned triumphantly. "Right, but did you catch onto the treatment the author gave them?"

"Well-l-l, he did have them portrayed as pretty good Joes, even the ones that looked horrible according to our standards."

"Good," said Cap with satisfaction, "I see we're both thinking along the same lines anyway. That was about all the analysts came up with after reviewing everything they could and then throwing it at me. Now then, what we'll have to do is find out if there's anything significant about it. Maybe someone who was oppressed here in the United States, or someone so deformed that he looks like a monster."

"Perhaps a freak in a circus?"

"Hm-m-m, could be. That hadn't occurred to me but it's worth looking into." He pushed back from the table reluctantly and announced, "Tell you what. Much as it goes against the grain, I'll clean up everything tonight while you do some more reading to catch up with me. That way we can get an early start tomorrow."

"Tomorrow, but I thought there'd be at least a day or two to catch up on it."

"Nope," said Cap with finality. "So far, I think the United States is the only one onto all of this but I can imagine what would happen if one or two other countries were to suddenly come to life and see what's going on."

"I don't know," differed Wade. "Maybe if everyone had the important stuff, all of them might be afraid to start anything. Especially if it were known that the other countries had them."

"That's getting too deep for me," said Cap, picking up a load of dishes and carrying them to the sink. "That comes under the heading of politics or policy, out of bounds for us."

Wade settled into a big, easy-chair with a stack of magazines on the floor beside him, and began reading. Occasionally he glanced up at the television set a short distance away.

"How you coming?" yelled Cap from the kitchen. "You about finished?"

"Almost. I've read all the stuff you had marked. About all we can do is compare notes and see if we come to the same conclusions."

Wade changed the TV set to another channel and, when he noted what was

on, called out, "Say, I suppose you've been watching TV shows, movies and the radio programs?"

"Sure," affirmed Cap. "That's been easier than the magazines due to the competition among script writers. Most of it's by name writers although there was one radio script writer we never did run down. He had his characters spilling top secret data all over the place."

"What about the rocket launching site right here?" asked Wade. "How much has been given out on it?"

"Nothing, why?" Cap appeared in the kitchen doorway, wiping his hands on a dishcloth.

"This TV thriller is showing a rocket launching and it's either a No. 1 model set or someone got some good movie reels of the place."

"What!" yelled Cap, rushing in. "But they couldn't, we haven't even allowed official films to be taken of it for fear they'd fall into the wrong hands." He stopped and glanced briefly at the program, then dashed to the phone. In a moment he was talking to Security and hung up.

"They're tracing it right away," he told Wade. "Lucky you saw it, maybe we can run something down before the trail gets cold. Usually we hear about it afterwards."

"It's following the old formula," remarked Wade. "Hero in trouble and all, rocket about to blow up."

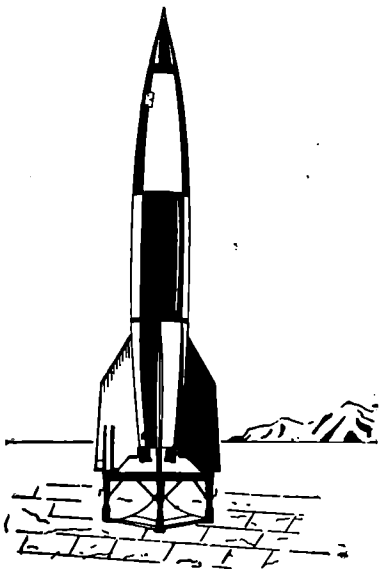
There was silence from Cap and he turned around to see what was wrong. He saw the other staring fascinated at the screen, much as if he were hypnotized.

Alarmed, Wade said sharply, "Cap, what's wrong?"

"That rocket pilot," said Cap hoarsely, "he's the dead image of Thompson."

"So he's the dead image of Thompson," remarked Wade dryly. "And who is Thompson?"

The wild light died out of Cap's eyes and he wiped the perspiration from his forehead. "I'm sorry," he apologized. "You probably knew we've sent out a couple of manned rockets?" Wade nodded. "Well, Thompson was in the first one sent out almost two months ago. He just disappeared and nothing was ever found of the rocket."



"If he'd gone horizontal, there was enough fuel to shoot him into the Pacific, wasn't there?"

"Sure, but it's getting so that even a sea gull can't fly faster than usual or people turn in Flying Saucer alarms. And the day that Thompson vanished is one of the few days that no reports were turned in. Someone would've been sure to see him. But I'd swear that that's Thompson."

They both looked at the screen and saw the hero in another and seemingly alien spaceship. He was talking earnestly to a tall, slender creature that stood easily on three legs. Its head was nothing more than a slight bulge of flesh from which waved five eyestalks.

Cap fidgeted from one foot to the other. "I'm glad that Intelligence is on it," he remarked. "They're undoubtedly shooting film so we can go back over it later."

The Earthman and alien were both peering into their ship's observation port and the picture dissolved into one that allowed the television audience to see through it.

"Pretty realistic shot of Earth," commented Wade. "At least I'd say it was, from the few photos released to the papers from the V-2 rocket series."

"That could be mocked up fairly easy anyway," said Cap. "Maybe we'll get a good lead out of this if it's one of the same series. See how fast they're dropping? Nothing we've got today could come in so fast, even from that far out, and still not crash."

"There!" cried out Wade. "There's the rocket site again, the one they showed at the beginning of the program."

Cap leaned closer. "I can't understand how they could get such pictures," he said in a low voice. "There just weren't any made." They both stared as the ground rushed up so rapidly that they could soon spot details.

"That settles that," Cap remarked grimly. "I thought for a moment that a high flying airplane might've taken obliques with a telephoto lens but look at that small building in the lower right-hand corner of the picture." Wade moved closer.

"I see it," he said, "but, of course, that wouldn't mean anything to me."

"It's my quarters, right where we're at now. And on the screen, it's directly down. No one could've taken a picture from there and got away with it, no matter how fast or high they were flying. Even if there were a practical reason for it."

"Looks like a happy ending anyway," pointed out Wade. The alien and his Earth friend had again come into view. The Earthman had an arm around the alien and they were both walking towards the quarters Cap had said was a replica of his. Then the screen faded out but before either man could say anything, the telephone began ringing raucously.

Both started. "Getting nervous, I guess," laughed Cap as he picked up the phone. "Hello, yes. That's right, we just finished watching it, it's over now." There was a slight pause as he listened and Wade could see his face grow blank with astonishment. "What?" roared Cap. "You mean you didn't get even a single frame of it?" There was another pause, then he slowly hung up.

"Trouble, I take it," sympathized Wade.

"Right, and as if we didn't have enough. Those fools over at the photo lab are supposed to be all set and ready for something like this but they couldn't even get the program, let alone photograph it. They said Channel 9 just had a musical variety show, nothing serious at all."

"Channel 9!" exclaimed Wade. "I'm afraid I'm to blame if everything didn't go right then. I was watching 13."

Cap lost his usual easy-going nature and rushed to the now blank TV set to see for himself. He turned to Wade, "That does it."

"What do you mean?"

"I mean that there's no station within four hundred miles that uses Channel 13; all except 9 are dead."

"And those characters were supposedly marching right up to our door," whispered Wade, almost breathlessly.

The two stared at each other, a growing tenseness tightening their faces. Then, breaking the dead silence of the room, there came a heavy and methodical knocking at the door—

THE END

Statement of the Ownership, Management, and Circulation required by the Act of Congress of August 24, 1912, as amended by the Acts of March 3, 1933, and July 2, 1946 (Title 39, United States Code, Section 233) of Astounding Science Fiction published monthly, at New York, N. Y., for October 1, 1952.

1. The names and addresses of the publisher, editor, managing editor, and business managers are: *Publishers*, Street & Smith Publications, Inc., 575 Madison Avenue, New York 22, N. Y.; *editor*, John W. Campbell, Jr., 575 Madison Avenue, New York 22, N. Y.; *managing editor*, none; *business manager*, none.

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An ASF Factual Article

OIL FOR TOMORROW

BY WALLACE WEST

***Ours is** a power civilization—and power depends on energy supply. Compact, convenient, plentiful energy supplies. Atomic energy supply is compact; the engine using it is not. Oil is the best we know—and finding it as fast as we use it is more and more important.*

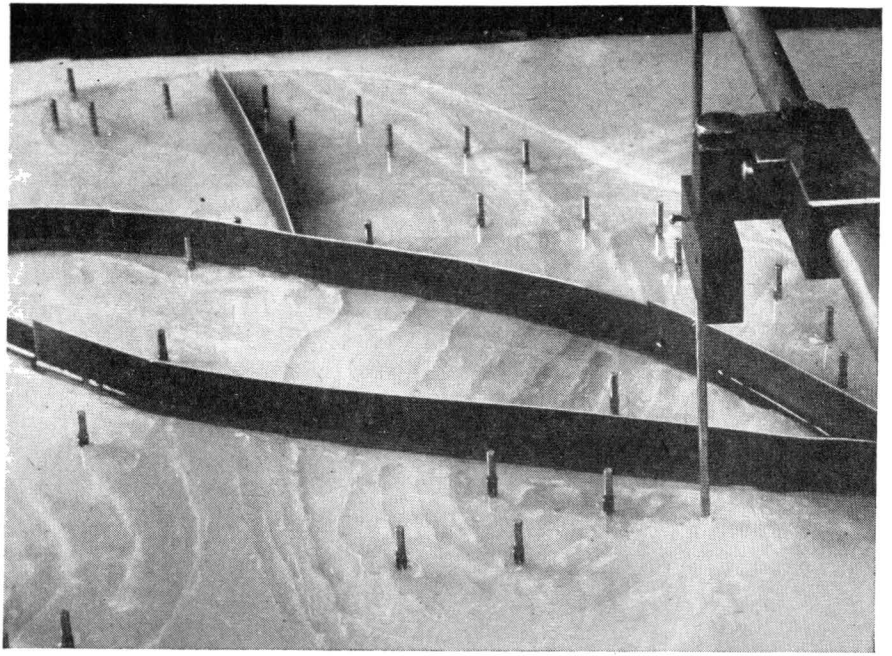
An "electronic brain" made of wet cardboard, a battery, some wire and a few pins is just one of the ingenious devices used by a small army of modern explorers which is combing the continental United States and its coastal waters in search of oil. (Fig. 1.)

The thickness, shape and slope of the blotter represents a stratum of porous rock thousands of feet underground. The salt water with which it is dampened takes the place of crude oil and natural gas that geologists believe are trapped there. Pins stuck into the paper show the location of completed or proposed wells. The electric current is a "stand-in" for the petroleum in the rock and the tremendous gas or water pressures which alone can push oil toward the wells.

By studying the way in which the current flows between the pins, laboratory technicians determine with remarkable accuracy the best locations for wells, optimum methods for maintaining underground pressures and the amount of oil available.

A much more elaborate field model comes complete with dials, knobs, recording tape and a pretty girl operator. (Fig. 2.) It still depends on the analogy that electrical conductivity equals permeability. And it can predict the behavior of a new field for the twenty to thirty years of its life.

Finding oil would be simple if geologists, geophysicists, geochemists and similar specialists really knew the shape of things underground. They have only the haziest idea of what goes on down



Standard Oil Co. (N. J.)

Fig. 1. This simple gadget made of wet cardboard and a group of electrodes can give a surprisingly accurate picture of the future performance of an oil reservoir thousands of feet underground PROVIDED that geologists have made fairly accurate estimates of the shape and size of the field. Before such a working model can be constructed, months, years and sometimes decades of surface, aerial and subsurface exploratory work must be done with seismographs, gravity meters, magnetometers and other delicate electronic instruments.

there, however, though theirs is probably the most heavily financed work in the field of mineralogy. (A very sizable chunk of the billion and a half dollars that oil companies plan to invest in wells and equipment this year will be spent on exploration.) Before a blotter can be cut to an approximate fit and before a guesswork geological map of the area can be drawn, almost endless exploration has to be conducted from the air, on the surface and even beneath the surface. It took more than thirty years of such painstaking work before the first successful well was brought in last year from the potentially-rich Williston Basin in North Dakota.

Early oil men had little use for geologists and their ilk, although they did go in for divining rods, complicated and incomprehensible "doodlebugs,"

dreams, hunches and even spiritualistic mediums. The most successful had a rule of thumb that served reasonably well in the oil-rich farmlands of western Pennsylvania. It was: "Go out near a cemetery, sail your hat into the air and drill where it lights. But, under no circumstances drill near a swamp."

Oddly enough, that old superstition still makes some sense. Cemeteries usually are placed on well-drained ground. Such land is likely to be located where rock strata bulge toward the surface. And it is under such bulges, or anticlines, that oil has a tendency to become trapped in recoverable quantities in the pores of sedimentary rocks.

As the search for oil intensified and spread to Ohio, Indiana, Texas, Oklahoma and on to the West Coast, geolo-

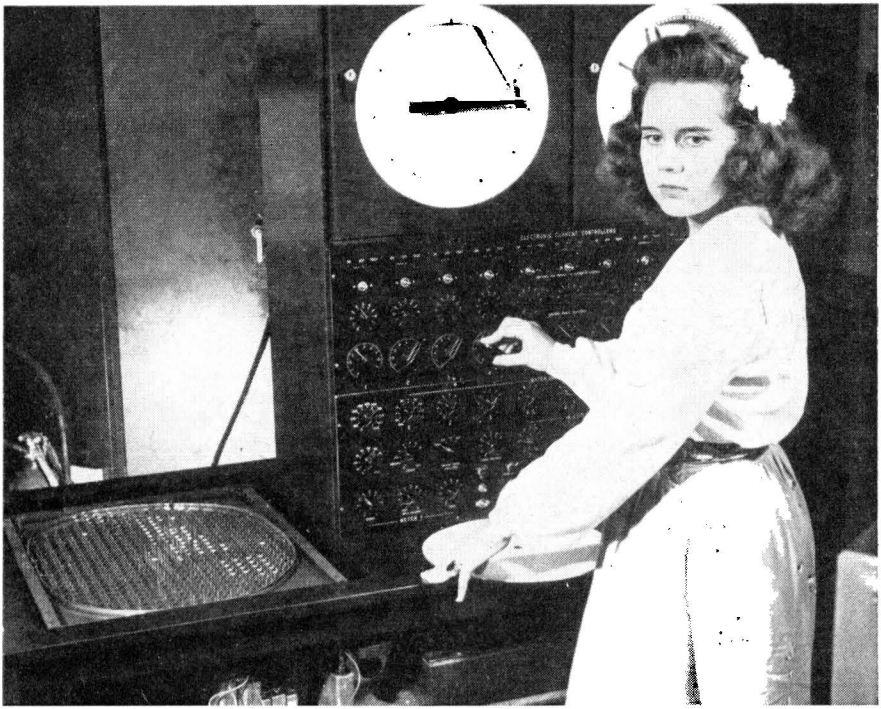


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Fig. 2. The Reservoir Behavior Analyzer, a refinement of the oil field model shown in Fig. 1. Using the analogy that electrical conductivity equals the permeability of a sedimentary rock stratum which holds oil in its pores, the analyzer can predict the behavior of a new field for the two or three decades of its estimated life. The big "if" involved is that the shape of the analyzer must conform with reasonable accuracy to the actual shape of the oil reservoir.

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Fig. 3. A gravity meter in operation near the Mackenzie River in Canada. A delicate spring inside this instrument measures the gravity pull of sub-surface geological structures. The readings are so minute that they must be viewed through a microscope. Because the gravity meter is so simple to operate, it is used more than any other device to locate structures without boring test wells and taking cores from them for laboratory analysis.

gists came into their own. They brought with them stadia rods, plane tables, alidades and Brunton compasses with which they could survey large areas. They chipped at the rocks with hammers. Later they made good use of gravity meters to measure the varying pulls and slopes of sub-surface structures. They devised portable rigs with which they could drill series of "shot

Fig. 4. A reflection seismograph record of a series of "shot hole" explosions is being inspected by an operator. Final interpretation of this record is made in the computing offices of the oil company conducting the survey.

holes." These holes were loaded with dynamite charges and exploded under the watchful eyes of those old earthquake trackers, the seismographs. Resulting squiggles on recording tapes exposed many of Mother Earth's secrets and allowed oil supply to keep pace with demand in pre-war days.

Such methods of exploration are agonizingly slow, however, even when jeeps and trucks are substituted for pack mules and wagon trains. They no longer can keep up with an oil demand that has increased twenty-nine per cent since the end of World War II and which runs now around two and a half billion barrels every year.

Laboratory research provided part of the answer. Today thousands of experts employed by hundreds of competitive producing companies constantly study cores of rock obtained from wells in the process of drilling. (Fig. 5.) They check those cores for evidence of marine fossils and other factors to determine if and why they are oil-bearing. The scientists pore over electric logs that picture geological conditions in the various strata penetrated. They analyze samples of weird mixtures of crude oil and natural gas brought up in sealed containers from

the bottoms of wells thousands of feet deep where the heat is intense and pressures exceed two thousand pounds per square inch.

Then they develop the best patterns for well drilling that permit the largest amounts of oil to be tapped by the fewest possible number of expensive holes. During the course of the years they have inaugurated scores of highly successful conservation practices. One is the repressuring of fields with the salt water and gas that comes to the surface with crude petroleum and that once were considered waste products. Repressuring of supposedly worn out fields has provided such a bountiful "second harvest" of oil that it is becoming common practice to do everything possible to *maintain* pressure in new fields. This is done by reinjecting gas and water and by holding the flow of wells to their maximum efficient rate (M.E.R.), the rate at which

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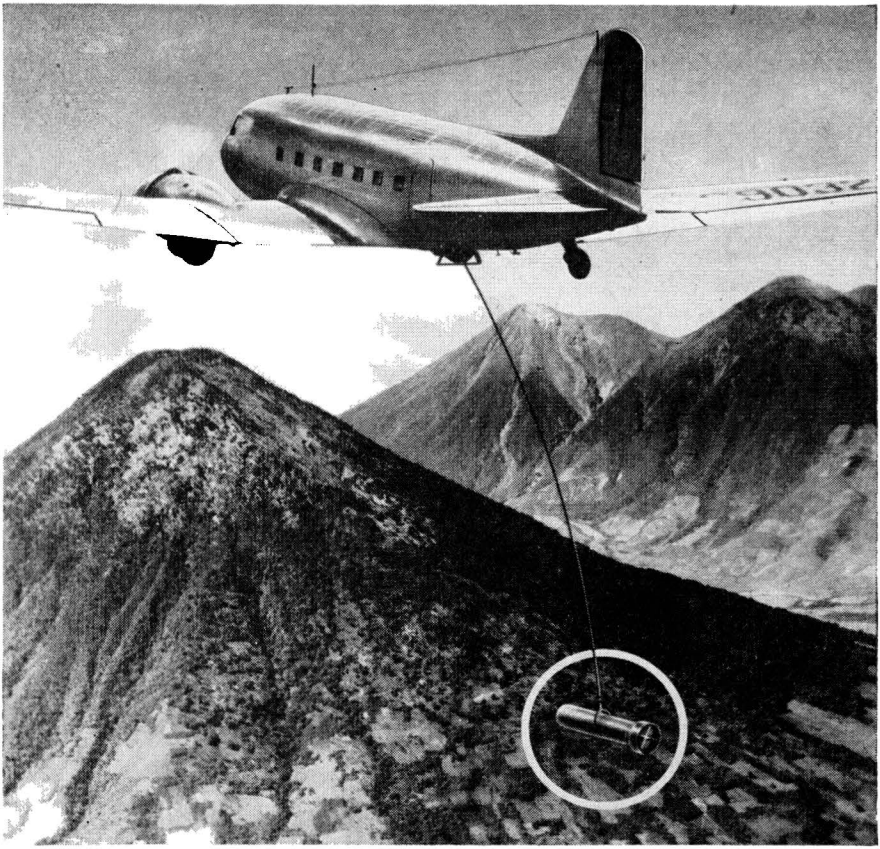
Fig. 5. Readings from electronic instruments are supplemented, wherever possible, by careful study of cores of rock removed from exploratory or "wildcat" wells drilled in virgin oil territory. The fossils and the oil droplets they contain tell geologists whether the well is likely to strike a reservoir or turn out to be a "duster." In somewhat similar fashion, sealed containers holding samples of oil and gas are removed from the bottoms of wells and sent to laboratories for examination. Much data about underground conditions can be obtained from such samples.

the maximum amount of oil can be obtained during the life of the field.

Such methods have expanded America's known, or "proved" underground reserves by boosting the amounts of oil recoverable from fields already located. Thus, in the 1920s, drillers expected to recover only about twenty per cent of the crude in a field before pressures fell so low that no more of it would be forced into the well bottoms. Today, in many fields, they can expect



American Petroleum Institute

Fig. 6. The flying magnetometer, newest proved aid in the search for underground oil. First developed by an oil company and perfected by the United States Navy and Air Force during World War II as an instrument for locating submerged Nazi submarines, the magnetometer is the ultimate in sensitivity.

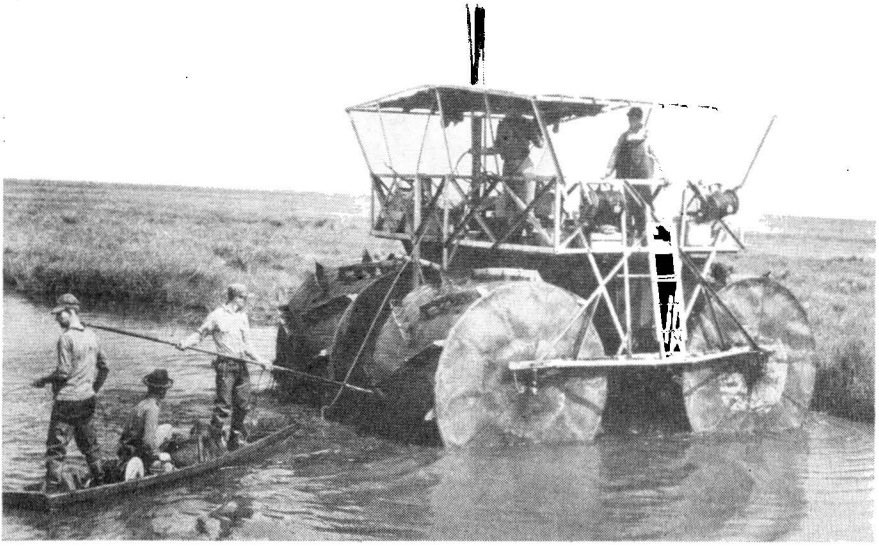


Fig. 7. Seismograph operations in the bayous of Louisiana call for all sorts of weird equipment—bateaux, quarter and repair boats, skiffs, great reels of seismograph cable for laying under water, pickup phones and amplifiers, light drilling units, pirogues to carry coupled drill stem lengths, and, weirdest of all, the lumbering marsh buggies. These can travel over land, swamp or water with equal ease. Marsh buggies carry supplies and tow the pirogues.

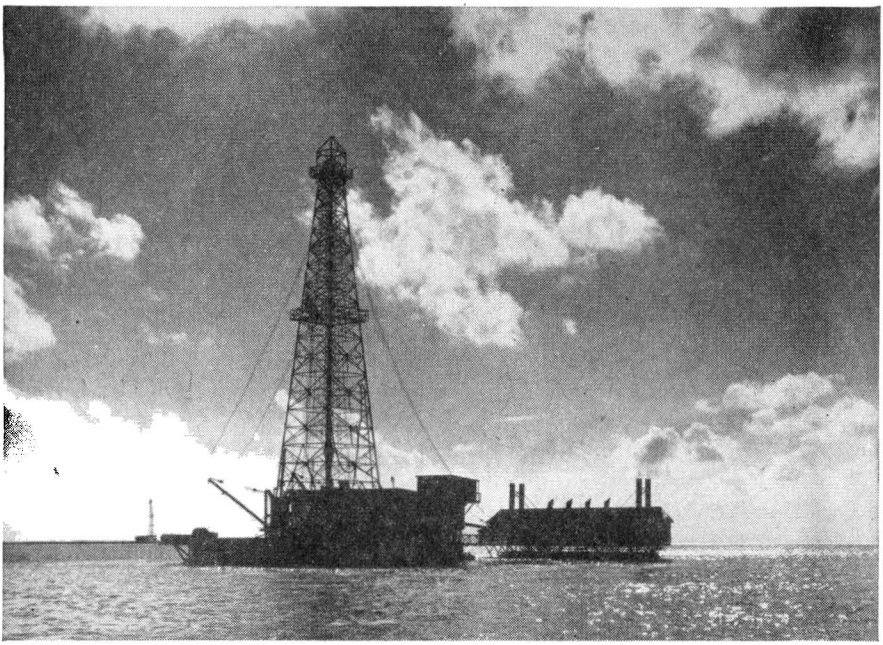
as much as eighty per cent recovery.

Despite these research achievements, however, new fields must be found—and found at greater depths and in inaccessible terrain as the older, shallower fields become exhausted. This year, for example, the oil industry's expansion program calls for the drilling of fifty-five thousand new wells, an increase of ten thousand over 1951. The airplane, teamed with the magnetometer, is playing a big role in determining where those wells can be drilled to greatest advantage.

The flying magnetometer is a sensitive electronic instrument developed by an oil company for exploration purposes and perfected during the war when it was used tensively in the search for German submarines. It measures variations in the earth's magnetic attraction caused by different types of sub-surface formations. Present practice is to tow a magnetometer on a long cable behind a plane flying back and forth on parallel paths over an area being investigated. (Fig. 6.) Readings are recorded on tape for analysis in field or base laboratories.

Aerial surveys are not intensive, of course, but they can be extensive and fast. This year, for instance, several companies joined forces and made a magnetometer survey of Northwestern Canada, from Alberta to the Arctic Circle. Findings were turned over to ground crews. As soon as the treacherous muskeg swamps are frozen hard enough to permit passage of men and vehicles, the crews will start intensive exploration in localities where the magnetometer tapes say that chances of finding oil are best. Helicopters will be used to drop supplies to explorers in this rugged territory and to keep them in close contact with their home offices.

The extension, in recent years, of oil exploration into the Louisiana bayous and under lakes, swamps and the so-called tidelands extending for miles off the Gulf and Pacific coasts has called for development of other unique techniques. Seismographic crews laying



American Petroleum Institute

Fig. 8. One of the huge, hurricane-proof drilling platforms used in the search for oil far from shore in the Gulf of Mexico. As many as six curved wells can be drilled from one derrick on such a platform. In this way a wide area of oil-bearing sand can be tapped without moving the platform. Crews often live in comfortable barracks attached to such platforms. They are always taken to shore when a storm threatens.

underwater dynamite charges live on comfortable houseboats and work from barges, powerboats, big-wheeled "marsh buggies." Actual drilling is done from platforms of all shapes and sizes. (Fig. 7.)

The marsh buggies, looking like conveyances from Venus or some other watery world, carry crews to locations which otherwise are reachable only by helicopter. Often the men work waste-deep in snake-infested water as they put down their shot holes and take their instrument readings.

Drill platforms range from the small affairs used in shallow water to the tremendous affairs complete with living quarters, Diesel motors and towering steel derricks which are needed several miles offshore. (Fig. 8.) The latter are built to withstand winds and waves of hurricane force, but crews are always removed in advance of a heavy storm. Oil companies working in the area maintain an elaborate weather forecasting service which supplements that supplied by the United States Weather Bureau. They also have an extensive network of ship-to-shore ultra-shortwave radio stations for the dispatching and protection of men, information and equipment.

Oil explorers are not resting on their oars these days, despite the enviable showing they have made in helping to push proved underground reserves of the United States to the record height of 32.5 billion barrels of liquid hydrocarbons. They are giving serious consideration to a recent report by the President's Materials Policy Commission in Washington and are setting their sights accordingly. The Commission predicts that, by 1975, the nation's oil requirements will be one hundred and ten per cent higher than they were in 1950. And that means that the oil business will have to find, produce, refine, transport and market fantastic amounts of new oil if it is to maintain its ninety-three-year record of always having filled the nation's needs, both in peace and in war. Oil men feel sure that they can meet the challenge.

Many of the techniques being developed to meet America's future requirements are still in the experimental stage. They range from methods for squeezing more oil out of a cubic foot of sandstone or limestone to those for squeezing more btu's out of a barrel of crude. All show promise but many are not economically feasible at the present moment.

In the experimental stage, for example, is a geochemical method for locating underground oil by the study of plants, soil and rock overlaying the deposit. This is based on the scientific premise that nothing is impermeable. Just as filterable viruses pass through procelain or glass so, it is believed, a tiny fraction of any oil, even though it may be tens of thousands of feet down, seeps to the surface. Soil in such an area should have a few parts per million of that oil in its structure.

Experts have spent a lot of money on such analyses. They also have employed a somewhat similar technique by sending electric currents through the ground between stations located several miles apart. The theory is that presence of an oil field would affect the current flow. No real proof of either theory has yet been obtained but the scientists keep working away. If the idea can be made to work, it can be of tremendous value because it will be the first direct method ever developed for finding oil.

The American Petroleum Institute, in co-operation with the Scripps Institution of Oceanography, is conducting fundamental research in an effort to determine what petroleum actually is. Until an answer is found many supplementary research programs are hamstrung. (It hasn't been too many decades since the best guess was that oil was the blood of a wild animal which prowled around underground. In fact, early court cases involving ownership of oil were determined according to the ancient English Common Law dealing with the capture of wild animals. If a man had oil under his farm but a neighbor drilled the first well and obtained most of it, the original owner could have no redress. His "beastie" had escaped. It belonged to the first person who could catch it!)

Today sub-surface rights are prorated on an equitable basis. And it is pretty well agreed that oil resulted from the decomposition, under heat and pressure, of plant and marine life that died in shallow seas and later was covered with silt. But no oil man will swear on a stack of Bibles that the stuff didn't fall out of the sky originally!

Other experiments under way seek to explore the earth vertically rather than horizontally. They are aimed at drilling deeper than the four miles which is about the present limit and at opening up "tight" and currently unproductive sands. (Photographs of such experimental equipment naturally are not available.)

At present the workaday answer to deeper drilling is to use bigger, heavier and, therefore, more expensive equipment. (Some deep wells have cost a million dollars and "wildcatters," as exploratory drillers are called, keep right on putting them down although chances of bringing in a commercially successful well in virgin oil territory is only one out of forty-four.) Very considerable progress has been made, however, in getting the bugs out of a so-called jet drill bit which is hanging up records for faster and deeper drilling without the necessity for heavier surface equipment. The term "jet bit" or "turbo bit" is a misnomer, however. The bit itself has the usual grinding teeth. But the chemical mixture—called "mud" by oil men—which cools and lubricates the teeth, washes out the cuttings and seals the hole against cave-ins, is forced through downward-pointing holes in the bit at

tremendous pressure. The big drawback to such bits at present is that they do not wear as well as conventional types in some kinds of rock. There is no value in a bit that cuts two or three times as fast as the standard brand if it has to be dragged to the surface and replaced two or three times as often. New and tougher steel alloys now being developed are expected to overcome this drawback.

Down-the-hole drilling is also being tried in the field. It makes use of a turbine at the bottom of a well. This is driven by the force of the mud mentioned before or is turned by an electric motor. Two bugs have to be eliminated: At present such turbines or motors cannot be made sufficiently heavy to put enough weight on the drill bits under them; and they wear out rapidly because they work submerged in sandy fluid.

Bacteria are being used in some experiments to loosen up tight sands and induce oil to flow into well bottoms. This works very well in the laboratory under controlled conditions. The bacteria can extract every drop of oil out of a piece of sandstone in a test tube. But no satisfactory way has yet been found to put the culture thousands of feet underground at just the proper place or to make it migrate between wells, mushing up the stone as it travels. At present the older techniques of dynamiting tight structures or treating them with hydrochloric acid remain more effective.

Much work is being done to find economical ways of drilling horizontal channels in various directions from the bottom of a well in order to induce greater oil flow. (This is different from the proved technique of drilling curved or dog-leg wells from one opening on the surface. The latter has been found very successful in working from a drilling platform in the Gulf or in seeking out an oil deposit under a mountain, a swamp or, even more unusual, under the Oklahoma State Capitol building.) A device has now been developed which can drill almost at right angles to the well bore. There also has been some talk of "mining for oil" but the costs of digging large shafts to great depths makes this out of the question.

Efforts are under way to "melt" oil wells into the ground with a sort of super-flame thrower. (No progress at

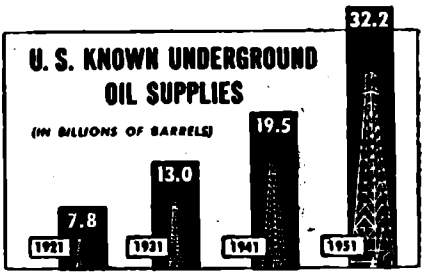


Fig. 9. But here is the final answer: Unending exploration has pushed known underground oil supplies in this country from 7.8 billion barrels in 1921 to 32.2 billion barrels in 1951.

this writing.) It has been proposed that heating elements be sunk into fields to make their oil flow faster. (Ditto.) Some work is being done on techniques for burning oil and gas underground. This is theoretically but not economically feasible.

Exploration also is going on in another field—that of the production of liquid fuels from natural gas, oil shale and coal. This is now being done on a pilot plant scale. We can rest assured that, if petroleum reserves eventually run low, the changeover to synthetics may be accomplished without causing a serious ripple in our economic life. Long before that becomes necessary we may be obtaining most of our heat and power from the sun, or from the atom.

Meanwhile, it remains a truism that, no matter how hard the explorers may work with their blotters, their seismographs, gravity meters, magnetometers and all the rest, only the drill finds oil. The expansion of our oil supplies and our reserves depends primarily on the drillers and their roughneck helpers who actually punch holes in the ground. Do their efforts pay off? Take a look at Iverson No. 1, the discovery well near Tioga, North Dakota, which opened up the vast new Williston Basin oil area in the Dakotas last year. Wells like that are responsible for pushing the nation's known underground oil supplies to heights which are the envy of the world. (Fig. 9.)

THE END

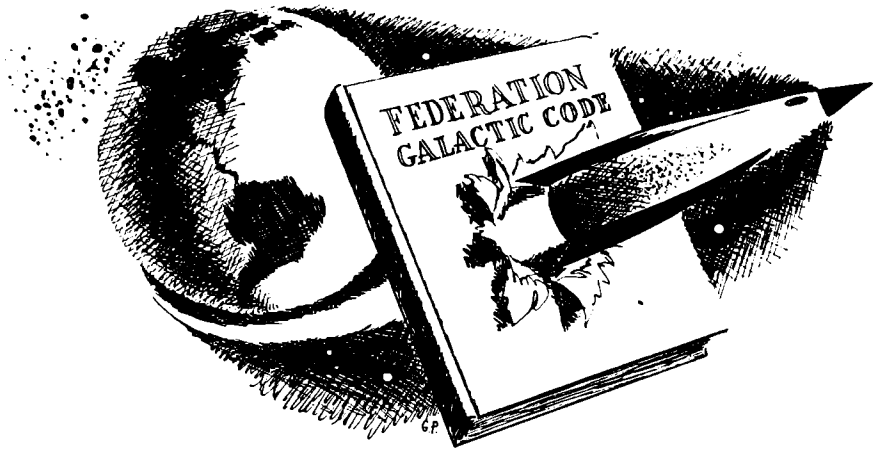
IN TIMES TO COME

Next issue leads off with the yarn by Raymond F. Jones which was promised for this month but just wouldn't fit in. It has one of the neatest kickers I've seen in some while. It's a point that will, I think, raise some high-power bull-session discussions. And, in its own little way, quite a snide point, too!

With it is an article; articles we don't ordinarily mention in In Times To Come; this one is an article of the not-to-miss category, however. It's titled "The Tiniest Time Traveler," and concerns a new theory with respect to the positron. The article, when I read it, led me to send a note to the author asking whether he could tell me what type of crystal had the greatest reflection power for electrons. It looks like maybe we'll get a crystal ball that works, one of these days! And maybe Asimov's positronic brained robots won't work after all; they'd get everything backwards! But then, maybe he can figure out the molecular structure of thiotimoline after all, if his robots don't work.

Hm-m-m—doesn't seem to make sense, does it? Well, it will after you've read the article!

THE EDITOR.



THE HIGH PURPOSE

BY ALGIS BUDRYS

A man can't feel he is truly a man because he has hopes, or plans, or ideas—but only when he knows that he can, in real fact, make those plans live. If he can't do that—he'll doubt himself.

Illustrated by Pawelka

The question has been raised as to why the offices of Federation government seem to be largely filled by descendants of the inhabitants of the Solar System. Discerning observers have also noted that the balance of power within the Federation has shifted from Eglis to Earth.

The explanation lies in the historical past, at the time when, in accordance with the then existing Federation policy, the inhabitants of the Solar System were contacted just before they achieved space flight independently."

"The Doctrine of 'Manifest Destiny' as Applied to Galactic Government"
Simon O'Terra,
New York, 5184

Garrison turned on the radio, and they stood around listening to it,

smoking, walking up and down on the concrete floor of the bunker, sitting on their cots, getting up again, grinding one cigarette into a brown smear on the floor, and lighting another. They spent the whole morning that way, until the reports began to get repetitious, and then they walked out of the bunker into the New Mexico sunshine and stood looking at each other. Nobody switched off the radio, and it kept babbling about visitors from another star until somebody kicked the door shut.

Finally, Garrison spoke. "Well?" he said.

"Well, what?" Collins asked bitterly.

"I wonder if there's room for a certified reaction-drive spacecraft pilot in the Federation navy," Ayers said to nobody in particular. He spat in the direction of the take-off stand and the gleaming hulk that surmounted it.

Carrulli laughed. "Me, I'm going down to New York's East Side and peddle bananas out of a reaction-drive pushcart. Can't tell—maybe they haven't got bananas on Eglis. Might become a big man in the export-import business." He laughed again.

"What're you gonna do, Davey?" Collins asked. "Go back to taking baby pictures?"

David looked at him uneasily. For the first time since training had begun, he was in exactly the same boat as the genuine technicians in the crew. The usual degree of condescension was missing in Collins' voice. "Might be safer than falling into craters, at that. I'll think about it," he said at last.

Carrulli turned suddenly and flung his cigarette to the ground. "But why now?" He clenched his fists and stared at the upflung bulk of the suddenly obsolete rocket. "Couldn't they hold off for a week? A *week!* Is it so long they couldn't wait?"

"Wonder what it's like to fly a Third Order drive," Ayers said quietly. Garrison nodded.

"And we've been sweating to get up to ten m.p.s.!" Collins put in.

They all lit new cigarettes and stared at the rocket flying in the sunshine. The red cross-hatching of the gantry crane enfolded it and threw a meshwork of shadows over its satiny finish. A billion dollars in metal stood useless in the sunshine.

"D'ja hear what Thomas said over the radio? He said the dinghy the Eglin ambassadors landed in was twice as big as that hunk of tin," Collins said.

David looked at him. "So what?"

"Huh?" They all turned to face him. Once more, he was the outsider, the passenger whose deep-space camera barely gave him the right to tag along. David thrust his hands into his pockets and wished he'd kept his mouth shut.

"I said 'so what?'," he repeated slowly. "What if they do fly around in spaceships a mile long? What if they do have this cozy comfy Federation?

Does that make us nothing? How long has it been since we didn't even have airplanes—sixty years? We did all right."

"So?" Garrison said.

"What do you mean?" David said uncomfortably.

"I mean what do *you* mean? What's your point?"

"Yeah, shutterbug, what's your pitch?" Ayers added.

"No pitch. I was just talking." David's hands twisted at his belt.

"Don't hand *me* that!" Garrison spoke fiercely. "You're thinking what I'm thinking, only I've got nerve enough to say it." He swung around and faced them all. "What Eagle Eye means is he wants us to take the ship up anyway. And that's been the point behind all this sad chatter of ours, hasn't it?" he demanded.

The others looked at him. They took shaky drags on their cigarettes and nodded, one by one. Garrison pulled his lips back. "O.K., now we've all bared our little bosoms. What are we going to do about it?"

"What *can* we do about it?" Carrulli asked nervously. "This is no Model T we're taking out for a Sunday joy ride. It's not up to us to decide."

"We decided *not* to take it up, didn't we? What's wrong with changing our minds?"

"*We* decided? The government—"

"Did we get an order?"

"That phone call—"

"Phone call. Phone call! You got a written order? You got a flimsy from the Secretary?"

"It's coming through. You know that."

"I don't know a thing! Show me an order that says for us to collect our time and go home, and I'll call it off. Meanwhile, we do it on schedule," Garrison barked. "Or am I outvoted or something?" he asked scornfully. He glared from one man to another.

Collins shrugged. "O.K. by me."

David nodded. Carrulli looked back to the ship for a moment. He said, "You guys can't go without me to tend your pushbuttons for you, and who am I to stand in the path of heroes?"

Ayers simply turned and ran back into the bunker. Over the mutter of the still excited radio, they heard him calling the fueling crew on the intercom. David grinned.

But when it was two days out, the ship swayed a bit beneath his feet as it corrected course. The only thought in his mind, for an instant, was that something had gone wrong. Then he thought of how they would look strewn over the dispassionate moon. The gaunt metal of the bulkheads held him like a gauntleted fist curled over a fly.

On the bridge, Garrison took his blunt hands from the firing keys and sank back into his chair. He turned to Carrulli with a disgusted look on his face. "Those stinkin' fuel technicians must have thrown a pint of Mescal

into the tanks to top 'em off. Slave months to plot an orbit and one little cough in a steering tube throws you!" He shook his head.

"Well, we're dead on again, Ed," Carrulli replied from behind his radarscope. "Old Looney's right where she should be." He checked a list of projected target readings for various positions along the trajectory. "Yep. Can't miss."

"Unless we take a meteor aboard, or throw a jet, or crack a seam, that is," Collins said from behind them.

"Hello, Gloomy. When'd you wake up?"

"Couple of minutes ago. Ayers'll be right here."

"It's time that sack rat came up here and did some work for a change," Garrison said. "How's our supercargo holding out?"

"If you mean the Kodak Kid, he was turning purple from seasickness—or is it spacesickness?—last time I saw him."

"I'll feed him some pills on my way down," Carrulli said. "They had no business at all picking a kid like that for this job, even if he is a good man with a camera."

"He'll do," Garrison said. "Wait'll he settles down a little."

"I didn't say he wouldn't. This was his idea in the first place, wasn't it?" Carrulli answered. "Which reminds me—the Secretary's still squirting frantic messages for us to turn around and come home." They all laughed derisively. Home would have to wait.

A seam loosened in Number Four compartment. In his cubicle, David heard the alarms and clapped his hands to his ears. The trembling of his arms smashed against him in rolling drumbeats. He shut his eyes.

Carrulli, Ayers, and Collins clattered down the narrow Bow Access companionway, the torch dolly skidding along behind them. They reached the door to the compartment and stopped to clamp helmets to their suits.

"Watch that!" Collins yelled. Carrulli had undogged the hatch, and the air blasting down the companionway behind them almost tore them loose from the deck. They scrambled inside and slid the door hastily shut. "Must be mighty close to no air in here," Collins remarked. "That must be some leak."

They clumped over to the spot where the last vestiges of air in the compartment were trickling out and surveyed it glumly.

"Insulation's crumpled up around it," Ayers said. "Looks like that self-sealing goo isn't much good if the insulation collapses and won't give it room to get at the leak."

"O.K., O.K., structural engineer, let's hurry it up!" Collins said. He flopped down on his stomach and began prying away insulation. "Leak is almost at deck level," he muttered. "There we go. Lovely little hole, isn't

it? Buckled the whole plate, too." He cursed mellifluously for a few moments. "Hand me that sledge, will you?" He began pounding on the plate. "That goo's sure not having any trouble flowing now, is it? Got it all over my hands." He swung the sledge with one hand while pushing bubbles of the black gunk out of his way. "Can't see what I'm doing here." Finally, he stood up. "O.K.! Let's get that torch fired up and weld this thing."

Carrulli knelt down beside the leak and began building a patch over it. Collins stood watching, holding his hands, which were splotched with the sealing compound, away from his sides and cursing.

"That's got it," Carrulli said. He snapped off the torch. Collins inspected the patch critically.

"Looks like she'll hold. Brother, I'd sure have hated to have a little thing like this wreck us, especially with everybody on Earth calling us fools for going at all. Bet those Eglins would bust a blood vessel laughing if we cracked up."

"Let's get the insulation back on before we drown in this stuff," Ayers said, looking at the black globules that were drifting around the compartment and breaking against their suits. He wiped uselessly at a blotch of the stuff that obscured half his faceplate.

"Sure, sure," Collins said. "Toss me that sledge again, will you? Got a bump here needs ironing out."

David opened his eyes.

Two men came up the companionway, carrying a folded raincoat by the arms and legs. The folded thing—*where* had they found a raincoat?—was twisted like washing before it is taken out of the basket and out to the line.

"Collins," they said.

David clamped his fingers around a strut. "Who?" he asked.

"Collins," they repeated patiently. The sledge had flicked from a stiff, slippery glove. Over the radios, it had sounded like a dropped bulb.

"What?" he asked quietly.

"The helmet." They spoke in unison. "It sounded . . . it went . . . plop! . . . and—"

All the air in Collins' body had gone out through the broken face-plate, out through the walls of his chest first, and tearing away his larynx and his teeth in the violence that exploded the teeth out of his clenched jaw.

Like a little rubber balloon that had been touched by the head of a pin.

A bit of frozen stuff on the raincoat thawed and splashed to the deck.

David looked at his hand. It was bloody, and there was a blotched place on the strut where he had been pounding it. The working party had gone off somewhere a while ago, carrying the thing tenderly, shuffling over the trail they left. Of course! They had gone to hang it up to dry.

They were about to land. "David.

Hey, Davey, come on up to the bridge!" rattled from his intercom speaker. He unstrapped himself from his bunk and weakly slid his feet into his boots. His face in the metal shaving mirror was pale, and his eyes were bloodshot. "Dave? You coming?"

He shuffled up the companionway and reached to open the hatch. It swung away, and he pulled himself through.

The first thing he saw was the moon.

It leered through the bubble turret, cold and bilious, and they were very close. He tilted his head back and looked at this blob of curdled frozen custard they had wanted to conquer merely because it was there, as the quotation put it. He shook himself.

"Sit here," Garrison said, and strapped him in. "How you feelin'?"

"Fine, fine. Never felt better."

"Yeah. Now look, we're gonna need your help. When I yell, close this switch, and keep it closed until Ayers spins that wheel. Got me?"

David nodded.

"Good. Now, the minute Ayers hits the last stop on that wheel, open the switch and get your hand away from it. Hit those two studs over there, and if that meter goes over two sixty, scream bloody murder. I'll try and do something about it before the jets burn off. Can you remember that?"

David looked at him. He was sitting in Collins' chair, he suddenly realized. He nodded again. Garrison went back to his seat behind the master board, and Ayers grinned at David from beside him. Carrulli waved from across the bridge.

The bulk of the rocket stuck out before them, jets and fins first, dribbling flame back over their lips, pointed at the airless clod.

And the board was ringing and winking, and Garrison yelled and Ayers spun his wheel and the flame gave Luna her duelling scars; the struts screamed; the hull drummed; the lights flickered; the bells rang.

They landed.

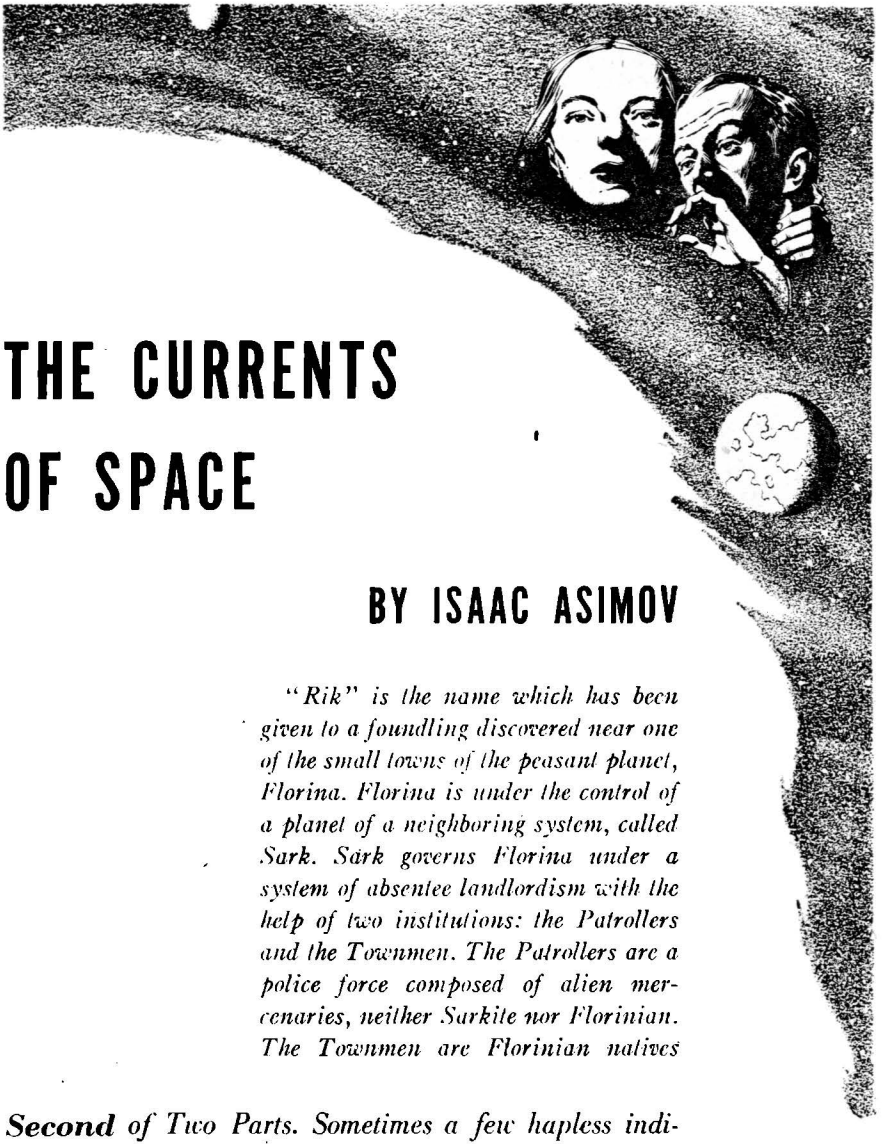
Garrison's fingers ticked off the switches on the board, *click*, *click*, *click*, and the battery lights went on. The air conditioners purred alone.

They clambered down the ladder, and walked on the moon.

Garrison stepped out on the pumice. He threw his head back and looked at the stars.

"Now," he said, "*now* we'll join your Federation."

THE END



THE CURRENTS OF SPACE

BY ISAAC ASIMOV

"Rik" is the name which has been given to a foundling discovered near one of the small towns of the peasant planet, Florina. Florina is under the control of a planet of a neighboring system, called Sark. Sark governs Florina under a system of absentee landlordism with the help of two institutions: the Patrollers and the Townmen. The Patrollers are a police force composed of alien mercenaries, neither Sarkite nor Florinian. The Townmen are Florinian natives

***Second** of Two Parts. Sometimes a few hapless individuals get caught in an eddy—a point of turbulence—between immense social currents in Space . . .*

Illustrated by van Dongen

who are given a bit of education and some privileges in return for controlling various Florinian towns on behalf of the Sarkite "Squires."

Rik is a full-grown adult when discovered, mindless and helpless, by a group of boys. The local Townman, Myrlyn Terens, takes him in charge and passes him over to Valona March, a young peasant girl, who, thereafter, feeds and cares for him, and grows to have a profound affection for him.

Slowly, Rik recovers from whatever shock he has been subjected to and begins remembering things. Almost the first thing he remembers is that he once had a job "analyzing Nothing" and that some terrible danger hangs over the planet, Florina. When Rik had first begun the ascent out of mindlessness, when he had learned to talk again, Valona had secretly taken him to a doctor, who recognized in him the symptoms of having been treated with a psycho probe, an instrument designed to eradicate portions of the memories, passions, unconscious motivations et cetera of the mind. Before he can report this, however, the doctor dies in a traffic accident.

Valona, with the knowledge of the psycho-probing, is perplexed by Rik's stories of danger to Florina and takes the problem to Townman Terens who has helped her out in the past. Terens is immediately interested, and in an attempt to follow the matter further decides to take Rik to the city library in the hope of stimulating his new-found memories.

The City, on Florina, is divided in two, horizontally. Lower City is the habitat of the Florinian proletariat, a depressed and impoverished population. Upper City, built on a cementalloy platform that covers Lower City, is the home of the Sarkite "Squires" who live in luxury and well-being.

The library to which Rik and the Townman go is in Upper City. There, after consulting the encyclopedia, Rik realizes that he was once a spatioanalyst, a profession which is engaged in analyzing the elementary composition of the rarefied gas that fills space between the stars, i.e. *he analyzes Nothing. An attempt to follow this up by consulting texts on spatioanalysis results in trouble. The texts concerned are on the reserved list and the librarian insists on their waiting while she obtains them.*

The Townman, suspecting trouble, tries to leave, but is stopped by a Patroller. The Patroller, however, is knocked unconscious by Valona March, who in her anxiety for her beloved Rik has secretly followed Rik and the Townman first to the city, then to the library. Since an attack on a Patroller by Florinians is a capital offense, the three must depart instantly. They flee to Lower City, are followed by Patroller squad cars, and when capture seems imminent they are rescued by "The Baker" a Florinian of Lower City who apparently makes a hobby of rescuing men in trouble with Patrollers.

For some reason, the Townman does not trust the Baker. That night, the

Townman leaves the security of the secret room in the Baker's bakery but tells Valona he will return. The Baker appears immediately afterward, apparently amused at the Townman's antics, and warns Valona that, though she might leave too, if she wishes, she was to make no attempt to remove Rik, who, apparently, is the individual the Baker is chiefly interested in.

Meanwhile, Selim Junz, a high official of the Interstellar spatioanalytic Bureau (I.S.B.), a supranational body, has spent nearly a year searching for a missing spatioanalyst. He only knows that the spatioanalyst in question radioed a message to the effect that he had discovered a terrible danger of Galactic importance hanging over Florina, and was never thereafter heard of again.

Junz does not take the story of "danger" very seriously as spatioanalysts in general are an insecure, neurotic group of people, uncomfortable on planets and happy only in the isolation of space. Most of them come from Earth, a planet with a radioactive crust, whose population would naturally feel safer and more secure in space. However, he becomes offended at the social system prevailing in the two worlds of Sark and Florina. He is angry that the Sarkites should so control Florina's people and her unique textile crop, kyrt.

Junz enlists the aid of Ludigan Abel, Trantorian ambassador to Sark. Trantor is the largest political grouping in the galaxy. Nearly half the inhabited worlds of the galaxy owe it allegiance and it is at the point of establishing a Galactic Empire. Abel agrees to help Junz, but, secretly, determines to do it in his own way and for his own purposes.

Junz, having heard of the affair in the city library on Florina and aware of the application for texts on spatioanalysis—he has arranged that all spatioanalytic texts in libraries be placed on reserve and that he be informed of any non-Sarkite seeker after those books—demands that the Sarkite government turn Rik over to him. The government informs him in turn that Rik is in the hands of the Baker whom they know as a Trantorian agent and whom, for the sake of the delicate interstellar situation, they will not touch.

Junz returns furiously to Abel, who admits that the Baker is one of his men but who explains that nevertheless he cannot turn Rik over to Junz since the Baker has been killed by a Patroller and Rik has disappeared.

This is indeed exactly what has happened. The Baker had fitted Rik and Valona with new non-Florinian clothes, an other-planet passport, and had prepared to send them away from Florina to the safety of Trantorian territory, when just as the three left the bakery, the Baker was shot down by a Patroller.

Rik and Valona run away and on Rik's suggestion manage to get to the city's spaceport where they stow away on a handy ship. They are able to do this because the normal complement of Patroller guards has been stripped to nothing because of the disturbances in

the city.

It is only after they are well out in space that Rik realizes he may have done the wrong thing. Thinking back on the incident of the killing of the Baker, he suddenly realizes that the "Patroller" who killed him had not been a Patroller at all, but the Townman in Patroller uniform.

Part 2.

Samia of Fife was five feet tall, exactly, and all sixty inches of her were in a state of quivering exasperation. She weighed one and a half pounds per inch and, at the moment, each of her ninety pounds represented sixteen ounces of solid anger.

She stepped quickly from end to end of the room, her dark hair piled in high masses, her spiked heels lending a spurious height and her narrow chin, with its pronounced cleft, quivering.

She said, "Oh, no. He wouldn't do it to me. He *couldn't* do it to me. Captain!"

Her voice was sharp and carried the weight of authority. Captain Racety bowed with the storm. "My lady?"

To any Florinian, of course, Captain Racety would have been a "Squire." Just that. To any Florinian, all Sarkites were Squires. But to the Sarkites there were two classes, Squires and *real* Squires. The captain was simply a Squire. Samia of Fife was a *real* Squire; or the feminine equivalent of one, which amounted to the same thing.

"My lady?" he asked.

She said, "I am not to be ordered about. I am of age. I am my own mistress. I choose to remain here."

The captain said, carefully, "Please to understand, my lady, that no orders of mine are involved. My advice was not asked. I have been told plainly and flatly what I am to do."

He fumbled for the copy of his orders half-heartedly. He had tried to present her with the evidence twice before and she had refused to consider it, as though by not looking she could continue, with a clear conscience, to deny where his clear duty lay.

She said once again, exactly as before, "I am not interested in your orders."

She turned away with a ringing of her heels and moved rapidly away from him.

He followed and said softly, "The orders include directions to the effect that if you are not willing to come, I am, if you will excuse my saying so, to have you carried to the ship."

She whirled. "You wouldn't dare do such a thing."

"When I consider," said the captain, "who it is who has ordered me to do it, I would dare anything."

She tried cajolery. "Surely, captain, there is no real danger. This is quite ridiculous; entirely mad. The

city is peaceful. All that has happened is that one Patroller was knocked down yesterday afternoon in the library. Really!"

"Another Patroller was killed this dawn, again by Florinian attack."

That rocked her, but her olive skin grew dusky and her black eyes flashed. "What has that to do with me? I am not a Patroller."

"My lady, the ship is being prepared right now. It will leave shortly. You will have to be on it."

"And my work? My research? Do you realize— No, you wouldn't realize."

The captain said nothing. She had turned from him. Her gleaming dress of copper *kyrt*, with its strands of milky silver, set off the extraordinary warm smoothness of her shoulders and upper arms. Captain Racety looked at her with something more than the bald courtesy and humble objectivity a mere Sarkite owed such a great lady. He wondered why such an entirely desirable bite-size morsel should choose to spend her time in mimicking the scholarly pursuits of a University don.

Samia knew well that her earnest scholarship made her an object of mild derision to people who were accustomed to thinking of the aristocratic ladies of Sark as devoted entirely to the manufacture of the glitter of polite society and, eventually, acting as incubators for at least, but not more than, two future Squires of Sark. She didn't care.

They would come to her and say, "Are you really writing a book, Samia?" and ask to see it, and giggle.

Those were the women. The men were even worse, with their gentle condescension and obvious conviction that it would only take a glance from themselves or a man's arm about her waist to cure her of her nonsense and turn her mind to things of real importance.

It began as far back, almost, as she could remember, because she had always been in love with *kyrt*, whereas most people took it for granted. *Kyrt!* The king, emperor, *god* of fabrics. There was no metaphor strong enough.

Chemically, it was nothing more than a variety of cellulose. The chemists swore to that. Yet with all their instruments and theories they had never yet explained why on Florina, and only on Florina in all the galaxy, cellulose became *kyrt*. It was a matter of the physical state; that's what they said. But ask them exactly in what way the physical state varied from that of ordinary cellulose and they were mute.

She learned ignorance originally from her nurse.

"Why does it shine, Nanny?"

"Because it's *kyrt*, Miakins."

"Why don't other things shine so, Nanny?"

"Other things aren't *kyrt*, Miakins."

There you had it. A two-volume

monograph on the subject had been written only three years before. She had read it carefully and it could all have been boiled down to her Nanny's explanation. *Kyrt* was *kyrt* because it was *kyrt*. Things that weren't *kyrt*, weren't *kyrt* because they weren't *kyrt*.

Of course, *kyrt* didn't really shine of itself, but properly spun it would gleam metallically in the sun in a variety of colors or in all colors at once. Another form of treatment could impart a diamond-sparkle to the thread. It could be made, with little effort, completely impervious to heat up to 600 Centigrade, and quite inert to almost all chemicals. Its fibers could be spun finer than the most delicate synthetics and those same fibers had a tensile strength no steel alloy known could duplicate.

It had more uses, more versatility than any substance known to man. If it were not so expensive it could be used to replace glass, metal, or plastic in any of infinite industrial applications. As it was, it was the only material used for cross-hairs on optical equipment, as molds in the casting of hydrochrons used in hyperatomic motors, and as light-weight, long-lived webbing where metal was too brittle or too heavy or both.

But this was, as said, small-scale use, since use in quantity was prohibitive. Actually, the *kyrt* harvest of Florina went into the manufacture of cloth that was used for the most fabulous garments in Galactic history. Florina clothed the aristocracy of a million worlds, and the *kyrt* harvest of the one world, Florina, had to be spread thin for that. Twenty women on a world might have outfits in *kyrt;* two thousand more might have a holiday jacket of the material, or perhaps a pair of gloves. Twenty million more watched from a distance and wished.

The million worlds of the galaxy shared a slang expression for the snob. It was the only idiom in the language that was easily and exactly understood everywhere. It went: "You'd think she blows her nose in *kyrt!*"

When Samia was older, she went to her father.

"What is *kyrt*, daddy?"

"It's your bread-and-butter, Mia."

"Mine?"

"Not just yours, Mia. It's Sark's bread-and-butter."

Of course! She learned the reason for that easily enough. Not a world in the galaxy but had tried to grow *kyrt* on their own soil. At first, Sark had applied the death-penalty to anyone, native or foreign, caught smuggling *kyrt* seed out of the planet. That had not prevented successful smuggling, and as the centuries passed, and the truth dawned on Sark, they abolished that law. Men from anywhere were welcome to *kyrt* seed at the price, of course—weight for weight—of finished *kyrt* cloth.

They might have it, because it turned out that *kyrt* grown anywhere

in the galaxy, *but* on Florina, was simply cellulose—white, flat, weak, and useless; not even honest cotton.

Was it something in the soil? Something in the characteristics of the radiation of Florina's sun? Something about the bacterial makeup of Florinian life? It had all been tried. Samples of Florinian soil had been taken. Artificial arc lights duplicating the known spectrum of Florina's sun had been constructed. Foreign soil had been infected with Florinian bacteria. And always the *kyrt* grew white, flat, weak and useless.

There was so much to be said about *kyrt* that had never been said. Material other than that contained in technical reports or in research papers or even in travel books. For five years, Samia had been dreaming of writing a real book about the story of *kyrt;* of the land it grew on and of the people that grew it.

It was a dream surrounded by mocking laughter, but she held to it. She had insisted on traveling to Florina. She was going to spend a season in the fields and a few months in the mills. She was going to—

But what did it matter what she was going to do? She was being ordered back.

With the sudden impulsiveness that marked her every act she made her decision. She would be able to fight this on Sark. Grimly, she promised herself she would be back on Florina in a week.

She turned to the captain and said, coolly, "When do we leave, sir?"

Samia remained at the observation port for as long as Florina was a visible globe. It was a green, springlike world, much pleasanter than Sark in climate. She had looked forward to studying the natives. She didn't like the Florinians on Sark, sapless men who dared not look at her but turned away when she passed in accordance with the law. On their own world, however, the natives, by universal report, were happy and carefree. Irresponsible, of course, and like children, but they had charm.

Captain Racety interrupted her thoughts. He said, "My lady, would you retire to your room?"

She looked up, a tiny, vertical crease between her eyes. "What new orders have you received, captain? Am I a prisoner?"

"Of course not. Merely a precaution. The space field was unusually empty before the take-off. It seems that another killing had taken place, again by a Florinian and the field's Patroller contingent has joined the rest on a manhunt through the City."

"And the connection of that with myself?"

"It is only that under the circumstances, which I ought to have reacted to by placing a guard of my own—I do not minimize my own offense—unauthorized persons may have boarded the ship."

face regarded her aloofly for a moment. He said, "The radiation is equivalent to that which would be given off by two ordinary people."

"Or a heating unit someone forgot to turn off."

"There is no drain on our power supply, my lady. We are ready to investigate, my lady, and ask only that you first retire to your room."

"For what reason?"

"I could not say, but scarcely to do our pleasure."

"You are romancing, captain."

"I am afraid not, my lady. Our energometrics were, of course, useless within planetary distance of Florina's sun, but that is not the case now and I am afraid there is definite excess heat radiation from Emergency Stores."

"Are you serious?"

The captain's lean, expressionless

She nodded silently and left the room. Two minutes later, his calm voice spoke unhurriedly into the communi-tube, "Break into Emergency Stores."

Myrlyn Terens, had he released his taut nerves the slightest, might easily, and even thankfully, have gone into hysteria. He had been a trifle too late in returning to the bakery. They had already left it and it was only by

good fortune that he met them in the street. His next action had been dictated; it was in no way a matter of free choice; and the Baker lay quite horribly dead before him.

Afterward, with the crowd swirling, Rik and Valona melting into the crowd and the air-cars of the Patrollers, the *real* Patrollers beginning to put in their vulture appearance, what could he do?

His first impulse to race after Rik he quickly fought down. It would do no good. He would never find them, and there was too great a chance that the Patrollers would not miss him. He scurried in another direction, toward the bakery.

His only chance lay in the Patroller organization itself. There had been generations of a quiet life. At least there had been no Florinian revolts to speak of in two centuries. The institution of the Townman—he grinned savagely at the thought—had worked wonders and the Patrollers had only perfunctory police duties since. They lacked the fine-pointed teamwork that would have developed under more strenuous conditions.

It had been possible for him to walk into a Patroller station at dawn, where his description must have already been sent, though obviously it had not been much regarded. The lone Patroller on duty was a mixture of indifference and sulkiness. Terens had been asked to state his business, but his business included a plastic two-by-four he had wrenched from the side of a crazy hovel at the outskirts of town.

He had brought it down upon the Patroller's skull, changed clothing and weapons. The list of his crimes was already so formidable that it did not bother him in the least to discover that the Patroller had been killed, not stunned.

Yet he was still at large and the rusty machinery of Patroller justice had so far creaked after him in vain.

He was at the bakery. The Baker's elderly helper, standing in the doorway in a vain attempt to peer knowledge of the disturbance into himself, squeaked thinly at the sight of the dread black-and-silver of Patrollerhood and oozed back into his shop.

The Townman lunged after him, crumpling the man's loose, floury collar into his pudgy fist and twisting. "Where was the Baker going?"

The old man's lips yawned open, but no sound came.

The Townman said, "I killed a man two minutes ago. I don't care if I kill another."

"Please. Please. I do not know, sir."

"You will die for not knowing."

"But he did not tell me. He made some sort of reservations."

"If you overheard so much, what else did you overhear?"

"He mentioned Wotex once. I think the reservations were on a spaceship."

Terens thrust him away.

He would have to wait. He would have to let the worst of the excitement outside die. He would have to risk the arrival of real Patrollers at the bakery.

But not for long. Not for long. He could guess what his erstwhile companions would do. Rik was unpredictable, of course, but Valona was an intelligent girl. From the way they ran, they must have taken him for a Patroller indeed and Valona was sure to decide that their only safety lay in continuing the flight that the Baker had begun for them.

The Baker had made reservations for them. A spaceship would be waiting. They would be there.

And he would have to be there first.

There was this about the desperation of the situation. Nothing more mattered. If he lost Rik, if he lost that potential weapon against the tyrants of Sark, his life was a small additional loss.

So when he left, it was without a qualm, though it was broad daylight, though the Patrollers must know by now it was a man in Patroller uniform they sought, and though two air-cars were in easy sight.

Terens knew the spaceport that would be involved. There was only one of its type on the planet. There were a dozen tiny ones in Upper City for the private use of space-yachts and there were hundreds all over the planet for the exclusive use of the ungainly freighters that carried gigantic bolts of *kyrt* cloth to Sark and machinery and simple consumer goods back. But among all those there was only one spaceport for the use of ordinary travelers; for the poorer Sarkites, Florinian civil servants and the few foreigners that managed to obtain permission to visit Florina.

The Florinian at the port's entry gate observed Terens' approach with every symptom of lively interest. The vacuum that surrounded him had grown insupportable.

"Greetings, sir," he said. There was a slyly eager tone in his voice. After all, Patrollers were being killed. "Considerable excitement in the City, isn't there?"

Terens did not rise to the bait. He had drawn the arced visor of his hat low and buttoned the uppermost button of the tunic.

Gruffly, he snapped, "Did two persons, a man and a woman, enter the port recently en route to Wotex."

The gatekeeper looked startled. For a moment he gulped and then, in a considerably subdued tone, said, "Yes, officer. About half an hour ago. Maybe less."

He reddened suddenly. "Is there any connection between them and—" Officer, they had reservations which were entirely in order. I wouldn't let foreigners through without proper authority."

Terens ignored that. Proper au-

thority! The Baker had managed to establish that in the course of a night. Galaxy, he wondered, how deeply into the Sarkite administration did the Trantorian espionage organization go?

"What names did they give?"

"Gareth and Hansa Barne."

"Has their ship left? Quickly!"

"N-no, sir."

"What berth?"

"Seventeen."

Terens forced himself to refrain from running, but his walk was little short of that. Had there been a real Patroller in sight that rapid, undignified half-run of his would have been his last trip in freedom.

A spaceman in officer's uniform stood at the ship's main air lock.

Terens panted a little. He said, "Have Gareth and Hansa Barne boarded ship?"

"No they haven't," said the spaceman, phlegmatically. He was a Sarkite and a Patroller was only another man in uniform to him. "Do you have a message from them."

With cracking patience, Terens said, "They *haven't* boarded!"

"That's what I've said. And we're not waiting for them. We leave on schedule, with or without them."

Terens turned away.

He was at the gatekeeper's booth again, "Have they left?"

"Left? Who, sir?"

"The Barnes. The ones for Wotex. They're not on board ship. Did they leave?"

"No, sir. Not to my knowledge."

"What about the other gates?"

"They're not exits, sir. This is the only exit."

"Check them, you miserable idiot."

The gatekeeper lifted the communitube in a state of panic. No Patroller had ever spoken to him so in anger and he dreaded the results. In two minutes, he put it down.

He said, "No one has left, sir."

Terens stared at him. Under his black hat, his sandy hair was damping against his skull and down each cheek there was the gleaming mark of perspiration.

He said, "Has any ship left the port since they entered?"

The gatekeeper consulted the schedule. "One," he said, "the liner *Endeavor*."

Volubly he went on, eager to gain favor with the angry Patroller by volunteering information. "The *Endeavor* is making a special trip to Sark to carry the Lady Samia of Fife back from Florina."

He did not bother to describe exactly by what refined manner of eavesdropping he managed to acquaint himself with the "confidential report."

But to Terens now, nothing mattered.

He backed slowly away. Eliminate the impossible and whatever remained, however improbable, was the truth. Rik and Valona had entered the spaceport. They had not been cap-

tured or the gatekeeper would certainly have known about it. They were not simply wandering about the port, or they would by now have been captured. They were not on the ship for which they had tickets. They had not left the field. The only object that had left the field was the *Endeavor*. Therefore, on it, possibly as captives, possibly as stowaways, were Rik and Valona.

And the two were equivalent. If they were stowaways, they would soon be captives. Only a Florinian peasant girl and a mind-wrecked creature would fail to realize that one could not stowaway on a modern spaceship.

And of all spaceships to choose among, they chose that which carried the daughter of the Squire of Fife.

The Squire of Fife!

IX.

The Squire of Fife was the most important individual on Sark and for that reason did not like to be seen standing. Like his daughter, he was short, but unlike her he was not perfectly proportioned, since most of the shortness lay in his legs. His torso was even beefy, and his head was undoubtedly majestic, but both were fixed upon short legs that were forced into a ponderous waddle to carry their load.

So he sat behind a desk and except for his daughter and personal servants and, when she was alive, his wife, none saw him in any other position.

There he looked the man he was. His large head, with its wide, nearly lipless mouth; broad, large-nostriled nose; and pointed, cleft chin could look benign and inflexible in turn, with equal ease. His hair, brushed rigidly back and, in careless disregard for fashion, falling nearly to his shoulders, was blue-black, untouched by gray. A shadowy blue marked the regions of his cheeks, lips and chin where his Florinian barber twice daily battled the unwearying inroads of facial hair.

The Squire was posing and he knew it. He had schooled expression out of his face and allowed his hands, broad, strong, and short-fingered, to remain loosely clasped on a desk whose smooth, polished surface was completely bare. There wasn't a paper on it, no communi-tube, no ornament. By its very simplicity, the Squire's own presence was emphasized.

He spoke to his pale, fish-white secretary with the special lifeless tone he reserved for mechanical appliances and Florinian civil servants. "I presume all have accepted?"

He had no real doubt as to the answer.

His secretary replied in a tone as lifeless, "The Squire of Bort stated that the press of previous business arrangements prevented his attending earlier than three."

"And you told him?"

"I stated that the nature of the present business made any delay inadvisable."

"The result?"

"He will be here, sir. The rest have agreed without reservation."

Fife smiled. Half an hour this way or that would have made no difference. There was a new principle involved, that was all. The Great Squires were too touchy with regard to their own independence, and such touchiness would have to go.

He was waiting, now. The room was large, the places for the others was prepared. The large chronometer, whose tiny powering spark of radioactivity had not failed nor faltered in a thousand years, said two twenty-one.

What an explosion in the last two days! The old chronometer might yet witness events equal to any in the past.

Yet that chronometer had seen many in its millennium. When it had counted its first minutes, Sark had been a new world of hand-hewn cities with doubtful contacts among the other, older worlds. It had been in the wall of an old brick building then, the very bricks of which had since become dust. It counted its even tenor through three short-lived Sarkite "empires" when the undisciplined soldiers of Sark managed to govern, for a longer or shorter interval, some half a dozen surrounding worlds. Its radioactive atoms had exploded in strict statistical sequence through two periods when the fleets of neighboring worlds dictated policy on Sark.

Five hundred years ago it had marked cool time as Sark discovered that the world nearest to it, Florina, had a treasure in its soil past counting. It moved evenly through two victorious wars and recorded solemnly the establishment of a conqueror's peace. Sark abandoned its empires, absorbed Florina tightly, and became powerful in a way that Trantor itself could not duplicate.

Trantor wanted Florina and other powers had wanted it. The centuries had marked Florina as a world for which hands stretched out through space, groping and reaching eagerly. But it was Sark whose hand clasped it and Sark, sooner than release that grasp, would allow Galactic war.

Trantor knew that! Trantor knew that!

It was as though the rhythmic silence of the chronometer set up the little singsong in the Squire's brain.

It was two twenty-three.

Nearly a year before, the five Great Squires of Sark had met. Then, as now, it had been here, in his own hall. Then, as now, the Squires, scattered over the face of the planet, each on his own continent, met in trimensic personification.

In a bald sense, it amounted to three-dimensional television in life-size with sound and color. The dupli-

cate could be found in any moderately well-to-do private home on Sark. Where it went beyond the ordinary was in the lack of any visible receiver. Except for Fife, the Squires present were present in every possible way but reality. The wall could not be seen behind them; they did not shimmer; yet a hand could have been passed through the most vital part of their body without their slightest awareness of the fact.

The true body of the Squire of Rune was sitting in the antipodes, his continent the only one upon which, at the moment, night prevailed. The cubic area immediately surrounding his image in Fife's office had the cold, white gleam of artificial light, dimmed by the brighter daylight about it.

Gathered in the one room, in body or in image, was Sark itself. It was a queer and not altogether heroic personification of the planet. Rune was bald and pinkly fat, while Balle was gray and dryly wrinkled. Steen was powdered and rouged, wearing the desperate smile of a wornout man pretending to a life-force he no longer had, and Bort carried indifference to creature comforts to the unpleasant point of a two-days growth of beard and dirty fingernails.

Yet they were the five Great Squires.

They were the topmost of the three rungs of ruling powers on Sark. The lowest rung was, of course, the Florinian civil service that remained steady through all the vicissitudes that marked the rise and fall of the individual noble houses of Sark. It was they who actually greased the axles and turned the wheels of government. Above them were the ministers and department heads appointed by the hereditary—and harmless—Chief of State. Their names and that of the chief himself were needed on state papers to make them legally binding, but their only duties consisted of signing their names.

The highest rung was occupied by these five, each tacitly allowed a continent by the remaining four. They were the heads of the families that controlled the major volume of the *kyrt* trade, and the revenues therefrom derived. It was money that gave power and eventually dictated policy on Sark, and these had it. And of the five, it was Fife that had the most.

The Squire of Fife faced them that day, nearly a year ago, and said, generally, to the other masters of the galaxy's second richest single planet—second richest after Trantor which, after all, had half a million worlds to draw upon, rather than two—:

"I have received a curious message."

They said nothing. They waited.

Fife handed a slip of metallite film to his secretary, who stepped from one seated figure to another, holding it well up for each to see, lingering just long enough for each to read.

To each of the four who attended the conference in Fife's office, he, himself, was real, and the others, including Fife, only shadows. The metallite film was a shadow as well. They could only sit and observe the light rays that focused across vast world-sectors from the Continent of Fife to those of Balle, Bort, Steen and to the island continent of Rune. The words they read were shadows on shadow.

Only Bort, direct and ungiven to subtleties, forgot that fact and reached for the message.

His hand extended to the edge of the rectangular image-receptor and cut off. His arm ended in a featureless stump. In his own chambers, Fife knew, Bort's arm had succeeded merely in closing upon nothingness and passing through the filmed message. He smiled; and so did the others. Steen giggled.

Bort reddened. He drew back his arm and his hand reappeared, as whole as ever.

Fife said, "Well, you have each seen it. If you don't mind, I will now read it aloud so that you may consider its significance."

He reached upward, and his secretary, by hastening his steps, managed to hold the film in the proper position for Fife's grasp to close upon it without an instant's groping.

Fife read mellowly, imparting drama to the words as though the message were his own and he enjoyed delivering it.

He said, "This is the message: 'You are a Great Squire of Sark and there is none to compete with you in power and wealth. Yet that power and wealth rests on a slender foundation. You may think that a planetary supply of *kyrt*, such as exists on Florina, is by no means a slender foundation, but ask yourself, how long will Florina exist? Forever?

" 'No! Florina may be destroyed tomorrow. It may exist for a thousand years. Of the two, it is more likely to be destroyed tomorrow. Not by myself, to be sure, but in a way you cannot predict or foresee. Consider that destruction. Consider, too, that your power and wealth are already gone, for I demand the greater part of it. You will have time to consider, but not too much time.

" 'Attempt to take too much time and I shall announce to all the galaxy and particularly to Florina, the truth about the waiting destruction. After that, there will be no more *kyrt*, no more wealth, no more power. None for me, but then I am used to that. None for you, and that would be extremely serious, since you are born to great wealth.

" 'Turn over most of your estates to myself in the amount and in the manner which I shall dictate in the near future and you will remain in secure possession of what remains. Not a great deal will be left you by your present standards, to be sure, but it will be more than the nothing that will otherwise be left you. Do not sneer at the fragment you will retain, either. Florina *may* last your lifetime and you will live, if not lavishly, at least comfortably.' "

Fife had finished. He turned the film over and over in his hand, then folded it gently into a silvery translucent cylinder through which the stenciled letters merged into a reddish blur.

He said in his natural voice, "It is an amusing letter. There is no signature and the tone of the letter, as you heard, is stilted and pompous. What do you think of it, Squires?"

Rune's ruddy face was set in displeasure. He said, "It's obviously the work of a man not far removed from the psychotic. He writes like a historical novel. Frankly, Fife, I don't see that such rubbish is a decent excuse to disrupt our traditions of continental autonomy by calling us together. And I don't like all this going on in the presence of your secretary."

"My secretary? Because he is a Florinian? Are you afraid his mind will be unsettled by such things as this letter? Nonsense." His tone shifted from one of mild amusement to the unmodulated syllables of command. "Turn to the Squire of Rune."

The secretary did so; his eyes were discreetly lowered and his white face was uncreased by lines and unmarred by expression. It almost seemed un-

touched by life.

"This Florinian," said Fife, careless of the man's presence, "is my personal servant. He is never away from me; never with others of his kind. But it is not for that reason that he is absolutely trustworthy. Look at him. Look at his eyes. Isn't it obvious to you that he has been under the psycho probe? He is incapable of any thought which is disloyal to myself in the slightest degree. With no offense attended, I can say that I would sooner trust him than any of you."

Bort chuckled. "I don't blame you. None of us owes you the loyalty of a probed Florinian servant."

Steen giggled again and writhed in his seat as though it were growing gently warm.

Not one of them made any comment on Fife's use of a psycho probe for personal servants. Fife would have been tremendously astonished, had they done so. The use of the psycho probe for any reason other than the correction of mental disorders or the removal of criminal impulses was forbidden. Strictly speaking, it was forbidden even to the Great Squires.

Yet Fife probed whenever he felt it necessary, particularly when the subject was a Florinian. The probing of a Sarkite was a much more delicate matter. The Squire of Steen, whose writhings at the mention of the probing Fife did not miss, was well-reputed to make use of probed Florinians.

"Now," Fife put his blunt fingers together, "I did not bring you all together for the reading of a crackpot letter. That, I hope, is understood. Actually, I am afraid we have an important problem on our hands. First of all, I ask myself, why bother only with myself. To be sure, I am the wealthiest of the Squires, but alone, I control only a third of the *kyrt* trade. Together the five of us control it all. It is easy to make five cello-copies of a letter, as easy as it is to make one."

"You use too many words," muttered Bort. "What do you want?"

Balle's withered and colorless lips moved in a dull gray face. "He wants to know, my Lord of Bort, if we have received copies of this letter."

"Then let him say so."

"I thought I was saying so," said Fife, evenly. "Well?"

They looked at one another, doubtfully or defiantly, as the personality of each dictated.

Rune spoke first. His pink forehead was moist with discrete drops of perspiration and he lifted a soft square of *kyrt* to mop the dampness out of the creases that lay between the folds of fat that ran semicircles from ear to ear.

He said, "I wouldn't know, Fife. I can ask my secretaries, who are all Sarkites, by the way. After all, even if such a letter had reached my office, it would have been considered a . . . what is it we say? . . . a crank letter.

It would never have come to me. That's certain. It's only your own peculiar secretarial system that kept you from being spared this trash yourself."

He looked about and smiled, his gums gleaming wetly between his lips above and below artificial teeth of chrome steel. Each individual tooth was buried deeply, knit to the jawbone, and stronger than any tooth of mere enamel could ever be. His smile was more frightening than his frown could possibly be.

Balle shrugged. "I imagine that what Rune has just said can hold for all of us."

Steen tittered. "I never read mail. Really, I never do. It's such a bore, and such loads come in that I just wouldn't have any *time*." He looked about him earnestly, as though it were really necessary to convince the company of this important fact.

Bort said, "Nuts. What's wrong with you all? Afraid of Fife? Look here, Fife, I don't keep any secretary because I don't need anyone between myself and my business. I got a copy of that letter and I'm sure these three did, too. Want to know what I did with mine? I threw it into the disposal chute. I'd advise you to do the same with yours. Let's go home. I'm tired."

His hand reached upward for the toggle switch that would cut contact and release his image from its presence in Fife.

"Wait, Bort." Fife's voice rang out harshly. "Don't do that. I'm not done. You wouldn't want us to take measures and come to decisions in your absence. Surely you wouldn't."

"Let us linger, Squire Bort," urged Rune, in his softer tones, though his little, fat-buried eyes were not particularly amiable. "I wonder why Squire Fife seems to worry so about a trifle."

"Well," said Balle, his dry voice scratching at their ears, "perhaps Fife thinks our letter-writing friend has information about a Trantorian attack on Florina."

"Pooh," said Fife, with scorn. "How would he know, whoever he is? Our Secret Service is adequate, I assure you. And how would he stop the attack if he received our properties as bribe? No, no. He speaks of the destruction of Florina as though he meant physical destruction, and not political destruction."

"It's just too *insane*," said Steen.

"Yes?" said Fife. "Then you don't see the significance of the events of the last two weeks?"

"Which particular events?" asked Bort.

"It seems a spatioanalyst has disappeared. Surely you've heard of that."

Bort looked annoyed and in no way soothed. "I've heard from Abel of Trantor about it. What of it? I know nothing of spatioanalysts."

"At least you've read a copy of the

last message to his base on Sark before he turned up missing."

"Abel showed it to me. I paid no attention to it."

"What about the rest of you?" Fife's eyes challenged them one by one. "Your memory goes back a week?"

"I read it," said Rune. "I remember it, too. Of course! It spoke of destruction also. Is that what you're getting at."

"Look here," Steen said, shrilly, "it was full of nasty hints that made no sense. Really, I do hope we're not going to discuss it now. I could scarcely get rid of Abel, and it was just before dinner, too. Most distressing. Really."

"There's no help for it, Steen," said Fife, with more than a trace of impatience. (What could one do with a thing like Steen?) "We must speak of it again. The spatioanalyst spoke of the destruction of Florina. Coincident with his disappearance, we receive messages also threatening the destruction of Florina. Is that coincidence?"

"You are saying that the spatioanalyst sent the blackmailing message?" whispered old Balle.

"Not likely. Why say it first in his own name, then anonymously?"

"When he spoke of it at first," said Balle, "he was communicating with his district office, not with us."

"Even so. A blackmailer deals with no one but his victim if he can help it."

"Well, then?"

"He has disappeared. Call the spatioanalyst honest. But he broadcast dangerous information. He is now in the hands of others who are *not* honest and they are blackmailers."

"What others?"

Fife sat grimly back in his chair, his lips scarcely moving. "You ask me seriously? Trantor."

Steen shivered. "Trantor!" His high-pitched voice broke.

"Why not? What better way to gain control of Florina. It's one of the prime aims of their foreign policy. And if they can do it without war, so much the better for them. Look here, if we accede to this impossible ultimatum, Florina is theirs. They offer us a little," he brought two fingers close together before his face, "but how long shall we keep even that?

"On the other hand, suppose we ignore this, and, really, we have no choice. What would Trantor do then? Why, they will spread rumors of an imminent end of the world to the Florinian peasants. As their rumors spread, the peasants will panic, and what can follow but disaster? What force can make a man work if he thinks the end of the world will come tomorrow. The harvest will rot. The warehouses will empty."

Steen lifted a finger to smooth the coloring on one cheek, as he glanced at a mirror in his own apartments, a mirror that was out of range of the

receptor cube.

He said, "I don't think that would harm us much. If the supply goes down, wouldn't the price go up? Then after a while it would turn out that Florina was still there and the peasants would go back to work. Besides, we could always threaten to clamp down on exports. Really, I don't see how any cultured world could be expected to live without *kyrt*. Oh, it's King *Kyrt* all right. I think this is a fuss about nothing."

He threw himself into an attitude of boredom, one finger placed delicately upon his cheek.

Balle's old eyes had been closed through all of this last. He said, "There can be no price increases now. We've got them at absolute ceiling height."

"Exactly," said Fife. "It won't come to serious disruption anyway. Trantor waits for any sign of disorder on Florina. If they could present the galaxy with the prospect of a Sark that was unable to guarantee *kyrt* shipments, it would be the most natural thing in the universe for them to move in to maintain what they call order and to keep the *kyrt* coming. And the danger would be that the free worlds of the galaxy would probably play along with them for the sake of the *kyrt*. Especially, if Trantor agreed to break the monopoly, increase production, and lower prices. Afterward it would be another story, but meanwhile, they would get their support.

"It's the only logical way that Trantor could possibly grip Florina. If it were simple force, the free galaxy outside the Trantorian sphere of influence would join us in sheer self-protection."

Rune said, "How does the spatioanalyst fit in this? Is he necessary? If your theory is adequate, it should explain that."

"I think it does. These spatioanalysts are unbalanced for the most part, and this one has developed some"—Fife's fingers moved, as though building a vague structure—"some crazy theory. It doesn't matter what. Trantor can't let it come out, or the Spatioanalytic Bureau would quash it. To seize the man and learn the details would, however, give them something which would probably possess a surface validity to nonspecialists. They could use it; make it sound real. The Bureau is a Trantorian puppet, and their denials, once the story is spread by way of scientific rumor-mongering, would never be forceful enough to overtake the lie."

"It sounds too complicated," said Bort. "Nuts. They can't let it come out, but then again they will let it come out."

"They can't let it come out as a serious scientific announcement, or even reach the Bureau as such," said Fife, patiently. "They can let it leak out as a rumor. Don't you see that?"

"Why's old Abel wasting his time looking for the spatioanalyst then?"

"You expect him to advertise the fact that he's got him. What Abel does and what Abel seems to be doing are two different things."

"Well," said Rune, "if you're right, what are we to do?"

Fife said, "We have learned the danger, and that is the important thing. We'll find the spatioanalyst if we can. We must keep all known agents of Trantor under strict scrutiny without really interfering with them. From their actions we may learn the course of coming events. We must suppress thoroughly any propaganda on Florina to the effect of the planet's destruction. The first faint whisper must meet with instant counteraction of the most violent sort.

"Most of all, we must remain united. That is the whole purpose of this meeting, in my eyes; the forming of a common front. We all know about continental autonomy and I'm sure there is no one more insistent upon it than I am—that is, under ordinary circumstances. These are not ordinary circumstances. You see that?"

More or less reluctantly, for continental autonomy was not a thing to be abandoned lightly, they saw that.

"Then," said Fife, "we will wait for the second move."

That had been a year ago. They had left and there had followed the strangest and completest fiasco ever to have fallen to the lot of the Squire of Fife in a moderately long and a more than moderately audacious career.

No second move followed. There were no further letters to any of them. The spatioanalyst remained unfound, while Trantor maintained a desultory search. There was no trace of apocalyptic rumors on Florina, and the harvesting and processing of *kyrt* continued its smooth pace.

The Squire of Rune took to calling Fife at weekly intervals.

"Fife," he would call, "anything new?" His fatness would quiver with delight and thick chuckles would force its way out of his gullet.

Fife took it bleakly and stolidly. What could he do? Over and over again, he sifted the facts. It was no use. Something was missing. Some vital factor was missing.

And then it all began exploding at once, and he had the answer. He *knew* he had the answer, and it was what he had *not* expected.

He had called a meeting once again. The chronometer now said two twenty-nine.

They were beginning to appear now. Bort first; lips compressed and a rough hang-nailed finger rasping against the grain of his grizzly-stubbled cheek. Then Steen, his face freshly washed clear of its paint and presenting a pallid, unhealthy appearance. Balle, indifferent and tired;

his cheeks sunken, his armchair well-cushioned, a glass of warm milk at his side. Lastly Rune, two minutes late, wet-lipped and sulky, sitting in the night once again. This time his lights were dimmed to the point where he was a hazy bulk sitting in a cube of shadow which Fife's lights could not have illuminated though they had had the power of Sark's sun.

Fife began. "Squires! Last year, I speculated on a distant and complicated danger. In so doing, I fell into a trap. The danger exists, but it is not distant. It is near us, very near. One of you already knows what I mean. The others will find out shortly."

"What *do* you mean?" asked Bort, shortly.

"High treason!" shot back Fife.

X.

Myrlyn Terens was not a man of action. He told himself that as excuse for now, leaving the spaceport, he found his mind paralyzed.

He had to pick his pace carefully. Not too slowly, or he would seem to be dawdling. Not too quickly, or he would seem to be running. Just briskly, as a Patroller would walk, a Patroller who was about his business and ready to enter his ground-car.

If only he could enter a ground-car! Driving one, unfortunately, did not come within the education of a Florinian, not even a Florinian Townman, so he tried to think as he walked and could not. He needed silence and leisure.

And he felt almost too weak to walk. He might not be a man of action but he *had* acted quickly now for a day and a night and another day. It had used up his lifetime's supply of nerve.

Yet he dared not stop.

If it were night, he might have had a few hours to think. But it was early afternoon.

If he could drive a ground-car, he could put the miles between himself and the City. Just long enough to think a bit before deciding on the next step. But he had only his legs.

If he could think. That was it. If he could think. If he could suspend all motion, all action. If he could catch the Universe between instants of time, order it to halt, while he thought things through. There must be some way.

He plunged into the welcome shade of Lower City. He walked stiffly, as he had seen the Patrollers walk. He swung his shock-stick in a firm grip. The streets were bare. The natives were huddling in their shacks. So much the better.

The Townman chose his house carefully. It would be best to choose one of the better ones; one with patches of colored plastic briquettes and polarized glass in the windows. The lower orders were sullen. They had less to lose. An "upper-man" would be falling over himself to help.

He walked up a short path to such a house. It was set back from the street, another sign of affluence. He knew he would have no need of pounding the door or breaking it in. There had been a noticeable movement at one window as he walked up the ramp. (How generations of necessity enabled a Florinian to smell the approach of a Patroller.) The door would open.

It did open.

A young girl opened it, her eyes white-rimmed circles. She was gawky in a dress whose frills showed a determined effort on the part of her parents to uphold their status as something more than the ordinary run of "Florinian trash." She stood aside to let him pass, her breath coming quickly between parted lips.

The Townman motioned to her to shut the door. "Is your father here, girl?"

She screamed, "Pa!", then gasped, "Yes, sir!"

"Pa" was moving in apologetically from another room. He came slowly. It was no news to him that a Patroller was at the door. It was simply safer to let a young girl admit him. She was less apt to be knocked down out of hand than he himself was, if the Patroller happened to be angry.

"Your name?" asked the Townman.

"Jacof, if it please you, sir."

The Townman's uniform had a thin-sheeted notebook in one of its pockets. The Townman opened it, studied it briefly, made a crisp check mark and said, "Jacof! Yes! I want to see every member of the household. Quickly!"

If he could have found room for any emotion but one of hopeless oppression, Terens would almost have enjoyed himself. He was not immune to the seductive pleasures of authority.

They filed in. A thin woman, worried, a child of about two years wriggling in her arms. Then the girl who had admitted him and a younger brother.

"That's all?"

"Everyone, sir," said Jacof, humbly.

"Can I tend the baby?" asked the woman, anxiously. "It's her naptime. I was putting her to bed." She held the young child out as though the sight of young innocence might melt a Patroller's heart.

The Townman did not look at her. A Patroller, he imagined, would not have, and he was a Patroller. He said, "Put it down and give it a sugar sucker to keep it quiet. Now, you! Jacof!"

"Yes, sir."

"You're a responsible boy, aren't you?" A native of whatever age was, of course, a "boy."

"Yes, sir." Jacof's eyes brightened and his shoulders lifted a trifle. "I'm a clerk in the food-processing center. I've had mathematics, long division. I can do logarithms."

Yes, the Townman thought, they've shown you how to use a table of logarithms and taught you how to pronounce the word.

He knew the type. The man would be prouder of his logarithms than a Squireling of his yacht. The polaroid in his windows was the consequence of his logarithms and the tinted briquettes advertised his long division. His contempt for the uneducated native would be equal to that of the average Squire for all natives and his hatred would be more intense since he had to live among them and was taken for one of them by his betters.

"You believe in the law, don't you, boy, and in the good Squires?" The Townman maintained the impressive fiction of consulting his notebook.

"My husband is a good man," burst in the woman, volubly. "He hasn't ever been in trouble. He doesn't associate with trash. And I don't. No more do the children. We always—"

Terens waved her down. "Yes. Yes. Now look, boy, I want you to sit right here and do what I say. I want a list of everyone you know about on this block. Names, addresses, what they do, and what kind of boys they are? Especially the last. If they're one of these trouble-makers, I want to know. We're going to clean up. Understand?"

"Yes, sir. Yes, sir. There's Husting first of all. He's down the block a way. He—"

"Not like that, boy. Get him a piece of paper, you. Now you sit there and write it all down. Every bit. Write it slowly because I can't read native chicken-tracks."

"I have a trained writing-hand, sir."

"Let's see it, then."

Jacof bent to his task, hand moving slowly. His wife looked over his shoulder.

Terens spoke to the girl who had let him in. "Go to the window and let me know if any other Patrollers come this way. I'll want to speak to them. Don't *you* call them. Just tell me."

And then, finally, he could relax. He had made a momentarily secure niche for himself in the midst of danger.

Except for the noisy sucking of the baby in the corner, there was reasonable silence. He would be warned of the enemy's approach in time for a fighting chance at escape.

Now he could think.

In the first place, his role as Patroller was about over. There were undoubtedly roadblocks at all possible exits from the town, and they knew he could use no means of transportation more complicated than a diamagnetic scooter. It would not be long before it would dawn on the search-rusty Patrollers that only by a systematic quartering of the town, block by block and house by house, could they be sure of their man.

When they finally decided that, they would undoubtedly start at the outskirts and work inward. If so, this house would be among the first to be entered, so his time was particularly limited.

Until now, despite its black and silver conspicuousness, the Patroller uniform was useful. The natives themselves did not question it. They did not stop to see his pale Florinian face; they did not study his appearance. The uniform was enough.

Before long, the pursuing hounds would find that fact dawning upon them. It would occur to them to broadcast instructions to all natives to hold any Patroller unable to show proper identification, particularly one with a white skin and sandy hair. Temporary identifications would be passed out to all legitimate Patrollers. Rewards would be offered. Perhaps

only one native in a hundred would be courageous enough to tackle the uniform no matter how patently false the occupant was. One in a hundred would be enough.

So he would have to stop being a Patroller.

That was one thing. Now another. He would be safe nowhere on Florina from now on. Killing a Patroller was the ultimate crime and for fifty years, if he could elude capture so long, the chase would remain hot. So he would have to leave Florina.

How?

Well, he gave himself one more day of life. This was a generous estimate. It assumed the Patrollers to be at maximum stupidity and himself in a state of maximum luck.

In one way, this was an advantage. A mere twenty-four hours of life was not much to risk. It meant he could take chances no sane man could possibly take.

He stood up.

Jacof looked up from his paper, "I'm not quite done, sir. I'm writing very carefully."

"Let me see what you have written."

He looked at the paper handed him, and said, "It is enough. If other Patrollers should come, don't waste their time saying that you have already made a list. They are in a hurry and may have other tasks for you. Just do as they say. Are there any coming now?"

The girl at the window said, "No, sir. Shall I go out in the street and look."

"It's not necessary. Let's see now. Where is the nearest elevator?"

"It's about a quarter of a mile to the left, sir, as you leave the house. You can—"

"Yes, yes. Let me out."

A squad of Patrollers turned into the street just as the door of the elevator ground into place behind the Townman. He could feel his heart pound. The systematic search was probably starting, and they were at his heels.

A minute later, heart beat still drumming, he stepped out of the elevator into Upper City. There would be no cover here. No pillars. No cementalloy hiding him from above.

He felt like a moving black dot among the glare of the garish buildings. He felt visible for two miles on every side and for five miles up in the sky. There seemed large arrows pointing to him.

There were no Patrollers in view. The Squires who passed looked through him. If a Patroller was an object of fear to a Florinian, he was an object of nothing-at-all to a Squire. If anything would save him, that would.

He had a vague notion of the geography of Upper City. Somewhere in this section was City Park. The most logical step would have been to ask directions; the next most logical to have entered any moderately tall

building and looked out from several of the upper-story terraces. The first alternative was impossible. No Patroller could possibly need directions. The second was too risky. Inside a building, a Patroller would be more conspicuous. Too conspicuous.

He simply struck out in the direction indicated by his memory of the maps of Upper City he had seen on occasion. It served well enough. It was unmistakably City Park that he came across in five minutes' time.

City Park was an artificial patch of greenery about one hundred acres in area. On Sark itself, City Park had an exaggerated reputation for many things from bucolic peace to nightly orgies. On Florina, those who had vaguely heard of it imagined it ten to a hundred times its actual size and a hundred to a thousand times its actual luxuriance.

The reality was pleasant enough. In Florina's mild climate it was green all year round. It had its patches of lawn, wooded areas and stony grottoes. It had a little pool with decorative fish in it and a larger pool for children to paddle in. At night, it was aflame with colored illumination till the light rain started. It was between twilight and the rain that it was most alive. There was dancing, trimensional shows, and couples losing themselves along the winding walks.

Terens had never actually been inside it. He found its artificiality repellent when he entered the park. He knew that the soil and rocks he stepped on, the water and trees around him, all rested on a dead-flat cementalloy bottom and it annoyed him. He thought of the *kyrl* fields, long and level, and the mountain ranges of the south. He despised the aliens who had to build toys for themselves in the midst of magnificence.

For half an hour, Terens tramped the walks aimlessly. What he had to do would *have* to be done in City Park. Even here it might be impossible. Elsewhere it *was* impossible.

No one saw him. No one was conscious of him. He was sure of that. Let them ask the Squires and Squirettes who passed him, "Did you see a Patroller in the park yesterday?"

They could only stare. They might as well be asked whether they had seen a tree-midge skitter across the path.

The park was *too* tame. He felt panic begin to grow. He made his way up a staircase between boulders and began descending into the cuplike hollow circled by small caves designed to shelter couples caught in the nightly rainfall.

And then he saw what he was looking for.

A man! A Squire, rather; stepping back and forth quickly. Smoking the stub of a cigarette with sharp drags, cramming it into an ash recess, where it lay quietly for a moment, then vanished with a quick flash. Consulting a pendant watch.

There was no one else in the hollow. It was a place made for the evening and night.

The Squire was waiting for someone. So much was obvious. Terens looked about him. No one was following him up the stairs.

There might be other stairs. There were sure to be. No matter. He could not let the chance go.

He stepped down toward the Squire. The Squire did not see him, of course, until Terens said, "If you'll pardon me?"

It was respectful enough, but a Squire is not accustomed to having a Patroller touch the crook of his elbow in however respectful a fashion.

"What do you want?" he demanded.

Terens abandoned neither the respect nor the urgency in his tone. (Keep him talking. Keep his eyes on yours for just half a minute!) He said, "This way, sir. It is in connection with the city-wide search for the native murderer."

"What are you talking about?"

"It will take just a moment."

Unobtrusively, Terens had drawn his neuronic whip. The Squire never saw it. It buzzed a little and the Squire strained into rigor and toppled.

The Townman had never raised a hand against a Squire before. He was surprised at how sick and guilty he felt.

There was still no one in sight. He dragged the wooden body, with its glazed and staring eyes, into the nearest cave. He dragged it to the cave's shallow end.

He stripped the Squire, yanking clothing off the stiffened arms and legs with difficulty. He stepped out of his own dusty, sweat-stained Patroller uniform and climbed into the Squire's underclothing. For the first time, he felt *kyrt* fabric with any part of himself but the fingers.

Then the rest of the clothing, and the Squire's skullcap. The last was necessary. Skullcaps were not entirely fashionable among the younger set but some wore them, this Squire, luckily, among them. To Terens it was a necessity as otherwise his light hair would make the masquerade impossible. He pulled the cap down tightly, covering ears and all.

Then he did what had to be done. The killing of a Patroller was, he suddenly realized, not the ultimate crime after all.

He adjusted his blaster to maximum dispersion and turned it on the unconscious Squire. In ten seconds, only a charred mass was left. It would delay identification; confuse the pursuers.

He reduced the Patroller's uniform to a powdery white ash with the blaster and clawed out of the heap blackened silver buttons and buckles. That, too, would make the chase harder. Perhaps he was buying only an additional hour, but that, too, was worth it.

And now he would have to leave

without delay. He paused a moment just outside the mouth of the cave to sniff. The blaster worked cleanly. There was only the slightest odor of burnt flesh and the light breeze would clear it in a few moments.

He was walking down the steps when a young girl passed him on the way up. For a moment, he dropped his eyes out of habit. He lifted them in time to see that she was young and quite good-looking, and in a hurry.

His jaws set. She wouldn't find him, of course. But she was late, or he wouldn't have been staring at his watch so. She might think he had grown tired of waiting and had left. He walked a trifle faster. He didn't want her returning, pursuing him breathlessly, asking if he had seen a young man.

He left the park, walking aimlessly. Another half hour passed.

What now? He was no longer a Patroller; he was a Squire.

But what now?

He stopped at a small square in which a fountain was centered in a plot of lawn. To the water a small quantity of detergent had been added so that it frothed and foamed in gaudy iridescence.

He leaned against the railing, back to the Western sun, and, one by one, slowly, he dropped blackened silver into the fountain.

He thought of the girl who had passed him on the steps as he did so. She had been very young. Then he thought of Lower City and the momentary spasm of remorse left him.

The silver remnants were gone and his hands were empty. Slowly, he began searching his pockets, doing his best to make it seem casual.

The contents of the pockets were not particularly unusual. A booklet of key slivers, a few coins, an identification card, (Holy Sark! Even the Squires carried them. But then, they didn't have to produce it for every Patroller that came along.)

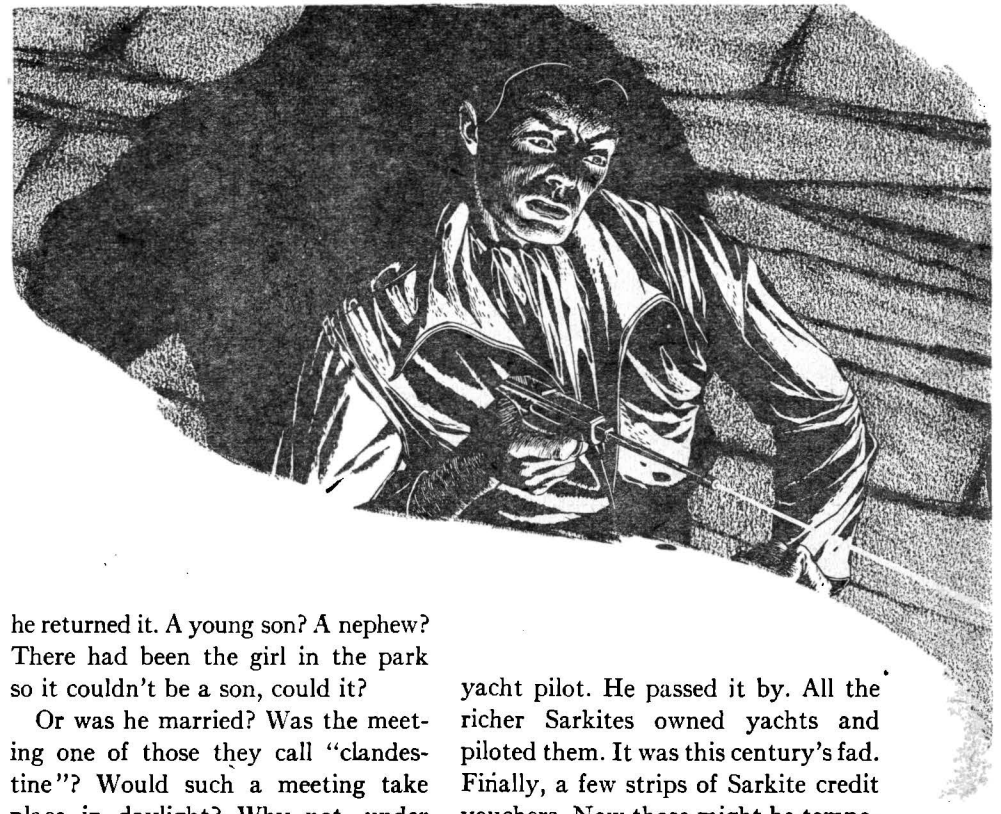
His new name, apparently, was Alstare Deamone. He hoped he wouldn't have to use it. There were only ten thousand men, women, and children in Upper City. The chances of his meeting one among them who knew Deamone personally was not large, but it wasn't insignificant either.

He was twenty-nine. Again he felt a rising nausea as he thought of what he had left in the cave, and fought it. A Squire was a Squire. How many twenty-nine-year-old Florinians had been done to death at their hands or by their directions? How many nine-year-old Florinians?

He had an address, too, but it meant nothing to him. His knowledge of Upper City geography was quite rudimentary.

Say!

A color portrait of a young boy, perhaps three, in pseudo-trimension. The colors flashed as he drew it out of its container, faded progressively as



he returned it. A young son? A nephew? There had been the girl in the park so it couldn't be a son, could it?

Or was he married? Was the meeting one of those they call "clandestine"? Would such a meeting take place in daylight? Why not, under certain circumstances?

Terens hoped so. If the girl were meeting a married man, she would not quickly report his absence. She would assume he had not been able to evade his wife. That would give him time.

No, it wouldn't. Instant depression seized him. Children playing hide-and-seek would stumble on the remains and run screaming. It was bound to happen within twenty-four hours.

He turned to the pocket's contents once more. A pocket-copy license as yacht pilot. He passed it by. All the richer Sarkites owned yachts and piloted them. It was this century's fad. Finally, a few strips of Sarkite credit vouchers. Now those might be temporarily useful.

It occurred to him that he hadn't eaten since the night before at the Baker's place. How quickly one could grow conscious of hunger.

Suddenly, he turned back to the yacht license. Wait, now, the yacht wasn't in use now; not with the owner dead. And it was *his* yacht. Its hangar number was 26, at Port 9. Well—

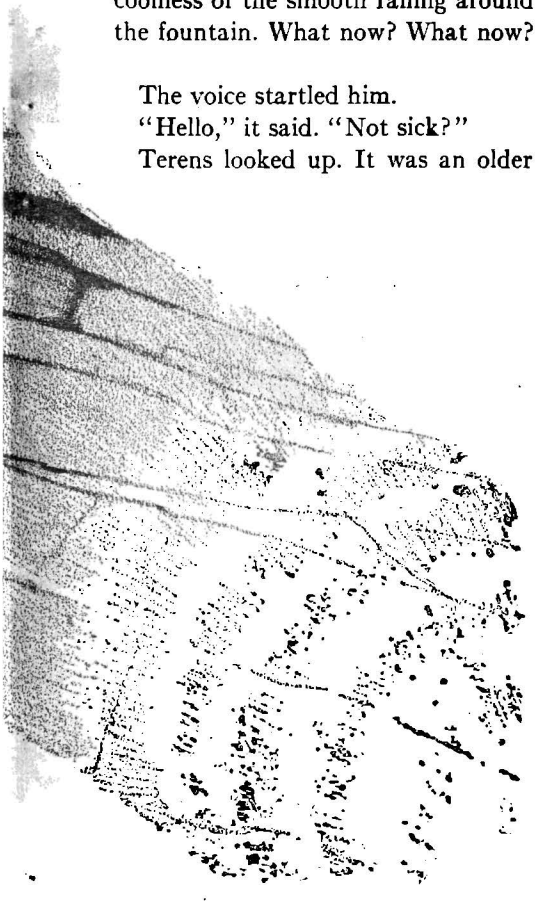
Where was Port 9? He hadn't the slightest notion.

He leaned his forehead against the coolness of the smooth railing around the fountain. What now? What now?

The voice startled him.

"Hello," it said. "Not sick?"

Terens looked up. It was an older



Squire. He was smoking a long cigarette containing some aromatic leaf while a green stone of some sort hung suspended from a gold wristband. His expression was one of kindly interest that astonished Terens into a moment of speechlessness, until he remembered. He was one of the clan himself, now. Among themselves, Squires might well be decent human beings.

The Townman said, "Just resting. Decided to take a walk and lost track of time. I'm afraid I'm late for an appointment now."

He waved his hand in a wry gesture. He could imitate the Sarkite accent fairly well from long association but he didn't make the mistake of trying to exaggerate it. Exaggeration was easier to detect than insufficiency.

The other said, "Stuck without a skeeter, hey?" He was the older man, amused by the folly of youth.

"No skeeter," admitted Terens.

"Use mine," came the instant offer. "It's parked right outside. You can set the controls and send it back here when you're through. I won't be needing it for the next hour or so."

To Terens, that was almost ideal. The skeeters were fast and skittery as chain-lightning, could outspeed and outmaneuver any Patroller groundcar. It fell short of ideal only in that Terens could no more drive the skeeter than he could fly without it.

"From here to Sark," he said. He knew that piece of Squire slang for "thanks," and threw it in. "I think I'll walk. It isn't far to Port 9."

"No, it isn't far," agreed the other.

That left Terens no better off than before. He tried again. "Of course, I wish I were closer. The walk to Kyrt Highway is healthy enough by itself."

"Kyrt Highway? What's that got to do with it."

Was he looking queerly at Terens. It occurred to the Townman, suddenly, that his clothing probably lacked the proper fitting. He said, quickly, "Wait! I'm twisted at that. I've got myself crossed-up walking. Let's see now." He looked about vaguely.

"Look. You're on Recket Road. All you have to do is go down to Triffis and turn left, then follow it into the port." He had pointed automatically.

Terens smiled. "You're right. I'm going to have to stop dreaming and start thinking. From here to Sark, sir."

"You can still use my skeeter."

"Kind of you, but—"

Terens was walking away, a bit too quickly, waving his hand. The Squire stared after him.

Perhaps tomorrow, when they found the corpse in the rocks and began searching, the Squire might think of this interview again. He would probably say, "There was something queer about him, if you know what I mean. He had an odd turn of phrase and didn't seem to know where he was. I'll swear he never heard of Triffis Avenue.

But that would be tomorrow.

He walked in the direction that the Squire had pointed out. He came to the glittering sign "Triffis Avenue," almost drab against the iridescent orange structure that was its background. He turned left.

Port 9 was alive with youth in yachting costume, which seemed to feature high-peaked hats and hip-bellying breeches. Terens felt conspicuous but no one paid attention to him. The air was full of conversation spiced with terms he did not understand.

He found Booth 26 but waited for minutes before approaching it. He wanted no Squire remaining persistently in its vicinity; no Squire who happened to own a yacht in a nearby booth who would know the real Alstare Deamone by sight and would wonder what a stranger was doing about his ship.

Finally, with the booth's neighborhood apparently safe, he walked over. The yacht's snout peered out from its hangar into the open field about which the booths were placed. He craned his neck to stare at it.

Now what?

He had killed three men in the last twelve hours. He had risen from Florinian Townman to Patroller; from Patroller to Squire. He had come from Lower City to Upper City and from Upper City to a spaceport. To all intents and purposes he owned a yacht, a vessel sufficiently spaceworthy to take him to safety on any inhabited world in this sector of the galaxy.

There was only one catch.

He could not pilot a yacht.

He was tired to the bone, and hungry to boot. He had come this far, and now he could go no farther. He

was on the edge of space but there was no way of crossing the edge.

By now the Patrollers must have decided he was nowhere in Lower City. They would turn the search to Upper City as soon as they could get it through their thick skulls that a Florinian would *dare*. Then the body would be found and a new direction would be taken. They would look for an impostoring Squire.

And here he was. He had climbed to the farthest niche of the blind alley and with his back to the closed end, he could only wait for the faint sounds of pursuit to grow louder and louder until eventually the bloodhounds would be on him.

Thirty-six hours ago, the greatest opportunity of his life was in his hands. Now the opportunity was gone and his life would soon follow.

XI.

It was the first time, really, that Captain Racety found himself unable to impose his will upon a passenger. Had that passenger been one of the Great Squires themselves, he might still have counted on co-operation. A Great Squire might be all-powerful on his own continent, but on a ship he would recognize that there could be only one master; the captain.

A woman was different. Any woman. And a woman who was the daughter of a Great Squire was completely impossible.

He said, "My lady, how can I allow you to interview them in private?"

Samia of Fife, her dark eyes snapping, said, "Why not? Are they armed, captain?"

"Of course not. That's not the point."

"Anyone can see they're only a pair of very frightened creatures. They're half scared to death."

"Frightened people can be very dangerous, my lady. They can't be counted on to act sensibly."

"Then why do you keep them frightened?" She had the tiniest stammer when she was angry. "You've got three tremendous sailors standing over them with blasters, poor things. Captain, I'll not forget this."

No she wouldn't, the captain thought. He could feel himself beginning to give way.

"If your ladyship pleases, will you tell me exactly what it is that you want?"

"It's simple. I've told you. I want to speak to them. If they're Florinians, as you say they are, I can get tremendously valuable information from them for my book. I can't do that, though, if they're too frightened to speak. If I could be with them alone, it would be fine. Alone, captain! Can you understand a simple word? *Alone!*"

"And what would I say to your father, my lady, if he discovers that I allowed you to remain unguarded in the presence of two desperate criminals."

"Desperate criminals! Oh, Great Space! Two poor fools that tried to escape their planet and had no more sense than to board a ship going to Sark! Besides, how would my father know?"

"If they hurt you, he would know."

"Why should they hurt me?" Her small fist lifted and vibrated, while she put every atom of force she could find into her voice. "I *demand* it, captain."

Captain Racety said, "How about this then, my lady? I will be present. I shall not be three sailors with blasters. I shall be one man with no blaster in view. Otherwise"—and in his turn he put every atom of force he could find into his voice—"I must refuse your demand."

"Very well, then." She was breathless. "Very well. But if I can't get them to speak because of you, I will personally see to it that you captain no more ships."

Valona put her hand hastily over Rik's eyes as Samia entered the brig.

"What's the matter, girl?" asked Samia, sharply, before she could remember that she was going to speak to them comfortingly.

Valona spoke with difficulty. She said, "He is not bright, lady. He wouldn't know you were a lady. He might have looked at you. I mean without intending any harm, lady."

"Oh, goodness," said Samia. "Let him look."

She went on, "Must they stay here, captain?"

"Would you prefer a stateroom, my lady?"

Samia said, "Surely you could manage a cell not quite as grim."

"It is grim to you, my lady. To them, I am sure this is luxury. There is running water here. Ask them if there was any in their hut on Florina."

"Well, tell those men to leave."

The captain motioned to them. They turned, stepping out nimbly.

The captain set down the light aluminum folding chair he had brought with him. Samia took it.

He said brusquely to Rik and Valona, "Stand up."

Samia broke in instantly. "No! Let them sit. You're not to interfere, captain."

She turned to them, "So you are a Florinian, girl."

Valona shook her head. "We're from Wotex."

"You needn't be frightened. It doesn't matter that you're from Florina. No one will hurt you."

"We're from Wotex."

"But don't you see that you've practically admitted you're from Florina, girl. Why did you cover the boy's eyes?"

"He's not allowed to look at a lady."

"Even if he's from Wotex?"

Valona was silent.

Samia let her think about it. She tried to smile in a friendly way. Then she said, "Only Florinians aren't al-

lowed to look at ladies. So you see you've admitted that you're a Florinian."

Valona burst out, "*He's* not."

"Are *you?*"

"Yes, I am. But he's not. Don't do anything to him. He *really* isn't a Florinian. He was just found one day. I don't know where he comes from, but it's not Florina." Suddenly, she was almost voluble.

Samia looked at her with some surprise. "Well, I'll speak to him. What's your name, boy?"

Rik was staring. Was that how women Squires looked? So small, and friendly-looking. And she smelled so nice. He was very glad she had let him look at her.

Samia said again, "What's your name, boy?"

Rik came to life but stumbled badly in the attempt to shape a monosyllable.

"Rik," he said. Then he thought, Why, that's not my name. He said, "I think it's Rik."

"Don't you know?"

Valona, looking woebegone, tried to speak, but Samia held up a sharply restraining hand.

Rik shook his head. "I don't know."

"Are you a Florinian?"

Rik was positive here. "No. I was on a ship. I came here from somewhere else." He could not bare to look away from Samia but he seemed to see the ship co-existing with her—a small and very friendly and homelike ship.

He said, "It was on a ship that I came to Florina and before that I lived on a planet."

"What planet?"

It was as though the thought were forcing its way painfully through mental channels too small for it. Then Rik remembered and was delighted at the sound his voice made, a sound so long forgotten.

"Earth! I come from Earth!"

"Earth?"

Rik nodded.

Samia turned to the captain. "Where is this planet, Earth?"

Captain Racety smiled briefly. "I never heard of it. Don't take the boy seriously, my lady. A native lies the way he breathes. It comes naturally to him. He says whatever comes first into his mind."

"He doesn't *talk* like a native." She turned to Rik again. "Where is Earth, Rik?"

"I—" He put a shaking hand to his forehead. Then he said, "It's in the Sirius Sector." The intonation of the statement made it half a question.

Samia said to the captain, "There is a Sirius Sector, isn't there?"

"Yes, there is. I'm amazed he has that right. Still, that doesn't make Earth any more real."

Rik said, vehemently, "But it is. I remember, I tell you. It's been so long since I remembered. I can't be wrong now. I can't."

He turned, gripping Valona's elbows and clawing at her sleeve. "Lona, tell them I come from Earth. I do. I do."

Valona's eyes were wide with anxiety. "We found him one day, lady, and he had no mind at all. He couldn't dress himself or talk or walk. He was nothing. Ever since then he's been remembering little by little. So far, everything he's remembered has been so." She cast a quick, fearful glance at the bored face of the captain. "He may really have come from Earth, Squire. No contradiction intended."

The last was a long-established conventional phrase that went with any statement that seemed in contradiction to a previous statement by a superior.

Captain Racety grunted. "He may have come from the center of Sark for all that story proves, my lady."

"Maybe, but there's something queer about all this," insisted Samia, making up her mind flatly, womanwise, on the side of romance. "I'm sure of it. What made him so helpless when you found him, girl? Had he been hurt?"

Valona said nothing at first. Her eyes darted helplessly back and forth. First to Rik, whose fingers clutched at his hair, then to the captain who was smiling without humor, finally to Samia, who waited.

"Answer me, girl," said Samia.

It was a hard decision for Valona to make, but no conceivable lie could substitute for the truth in this place and at this time. She said, "A doctor once looked at him. He said m . . . my Rik was psycho-probed."

"Psycho-probed!" Samia felt a slight wash of repulsion well over her. She pushed her chair away. It squeaked against the metal floor. "You mean he was psychotic?"

"I don't know what that means, lady," said Valona, humbly.

"Not in the sense you're thinking of, my lady," said the captain, almost simultaneously. "Natives aren't psychotic. Their needs and desires are too simple. I've never heard of a psychotic native in my life."

"But then—"

"It's simple, my lady. If we accept this fantastic story the girl tells, we can only conclude that the boy had been a criminal, which is a way of being psychotic, I suppose. If so, he must have been treated by one of those quacks who practice among the natives, nearly killed and was then dumped in a deserted section to avoid detection and prosecution."

"But it would have to be someone with a psycho probe," protested Samia. "Surely you wouldn't expect natives to be able to use them."

"Perhaps not. But then you wouldn't expect an authorized medical man to use one so inexpertly. The fact that we arrive at a contradiction, proves the story to be a lie throughout. If you will accept my suggestion, my lady, you will leave these creatures to our handling. You see that it's useless to expect anything out of them."

Samia hesitated. "Perhaps you're right."

She rose and looked uncertainly at Rik. The captain stepped behind her, lifted the little chair and folded it with a snap.

Rik jumped to his feet. "Wait!"

"If you please, my lady," said the captain, holding the door open for her. "My men will quiet him."

Samia stopped at the threshold. "They won't hurt him?"

"I doubt if he'll make us go to extremes. He will be easy handling."

"Lady! Lady!" Rik called. "I can prove it. I'm from Earth."

Samia stood irresolute for a moment. "Let's hear what he has to say."

The captain said, coldly, "As you wish, my lady."

She returned, but not very far. She remained a step from the door.

Rik was flushed. With the effort of remembering, his lips drew back into the caricature of a smile. He said, "I remember Earth. It was radioactive. I remember the Forbidden Areas and the blue horizon at night. The soil glowed and nothing would grow in it. There were just a few spots men could live on. That's why I was a spatioanalyst. That's why I didn't mind staying in space. My world was a dead world."

Samia shrugged, "Come along, captain. He's simply raving."

But this time it was Captain Racety who stood there, openmouthed. He muttered, "A radioactive world!"

She said, "You mean there *is* such a thing."

"Yes." He turned wondering eyes on her. "Now where could he have picked *that* up."

"How could a world be radioactive and inhabited."

"But there *is* one. And it *is* in the Sirius sector. I don't remember its name. It might even be Earth."

"It *is* Earth," said Rik, proudly and with confidence. "It is the oldest planet of the galaxy. It is the planet on which the whole human race originated."

The captain said, softly, "That's so!"

Samia said, mind whirling, "You mean the human race originated on this Earth?"

"No, no," said the captain, abstractedly. "That's superstition. It's just that that's how I came to hear about the radioactive planet. It claims to be Man's home planet."

"I didn't know we were supposed to have a home planet."

"I suppose we started somewhere, my lady, but I doubt that anyone can possibly know on what planet it happened."

With sudden decision, he walked toward Rik. "What else do you remember?"

He almost added "boy," but held it back.

"The ship mostly," said Rik, "and spatioanalysis."

Samia joined the captain. They stood there, directly before Rik, and

Samia felt the excitement returning. "Then it's all true? But then how did he come to be psycho-probed?"

"Psycho-probed!" said Captain Racety, thoughtfully. "Suppose we ask him. Here you, native or outworlder or whatever you are, how did you come to be psycho-probed?"

Rik looked doubtful. "You all say that. Even Lona. But I don't know what the word means?"

"When did you stop remembering, then?"

"I'm not sure." He began again, desperately. "I was on a ship."

"We know that. Go on."

Samia said, "It's no use barking, captain. You'll drive out what few wits are left him."

Rik was entirely absorbed in wrenching at the dimness within his mind. The effort left no room for any emotion. It was to his own astonishment that he said, "I'm not afraid of him, lady. I'm trying to remember. There was danger. I'm sure of that. Great danger to Florina, but I can't remember the details about it."

"Danger to the whole planet?" Samia cast a swift glance at the captain.

"Yes. It was in the currents."

"What currents?" asked the captain.

"The currents of space."

The captain spread his hands and let them drop. "This is madness."

"No, no. Let him go on." The tide of belief had shifted to Samia again. Her lips were parted, her dark eyes gleamed and little dimples between cheek and chin made their appearance as she smiled, "What are the currents of space?"

"The different elements," said Rik, vaguely. He had explained that before. He didn't want to go through that again.

He went on rapidly, nearly incoherently, speaking as the thoughts came to him, driven by them. "I sent a message to the local office on Sark. I remember that very clearly. I had to be careful. It was a danger that went beyond Florina. Yes. Beyond Florina. It was as wide as the Milky Way. It had to be handled carefully."

He seemed to have lost all real contact with those who listened to him, to be living in a world of the past before which a curtain was tearing away in places. Valona placed a soothing hand upon his shoulder and said, "Don't!" but he was unresponsive even to that.

"Somehow," he went on, breathlessly, "my message was intercepted by some official on Sark. It was a mistake. I don't know how it happened."

He frowned. "I'm sure I sent it to the local office on the Bureau's own wave length. Do you suppose the sub-ether could have been tapped?" He did not even wonder that the word "sub-ether" came so easily to him.

He might have been waiting for an answer, but his eyes were still unsee-

ing. "Anyway, when I landed on Sark, they were waiting for me."

Again a pause, this time long and meditative. The captain did nothing to break it; he seemed to be meditating himself.

Samia, however, said, "Who was waiting for you? Who?"

Rik said, "I . . . I don't know. I can't remember. It wasn't the office. It was someone of Sark. I remember speaking to him. He knew about the danger. He spoke of it. I'm sure he spoke of it. We sat at a table together. I remember the table. He sat opposite me. It's as clear as space. We spoke for quite a while. It seems to me I wasn't anxious to give details. I'm sure of that. I would have had to speak to the office first. And then he—"

"Yes?" prompted Samia.

"He did something. He— No, nothing more will come. *Nothing will come!*"

He screamed the words and then there was silence, a silence that was anticlimactically broken by the prosaic buzz of the captain's wrist communo.

He said, "What is it?"

The answering voice was reedy and precisely respectful. "A message to the captain from Sark. It is requested that he accept it personally."

"Very well. I will be at the subetherics presently."

He turned to Samia, "My lady, may I suggest that it is, in any case, dinner time."

He saw that the girl was about to protest her lack of appetite, to urge him to leave and not to bother about her. He continued, more diplomatically, "It is also time to feed these creatures. They are probably tired and hungry."

Samia could say nothing against that. "I must see them again, captain."

The captain bowed silently. It might have been acquiescence. It might not.

Samia of Fife was thrilled all through. Her studies of Florina satisfied a certain aspiration to intellect within her, but the Mysterious Case of the Psycho-probed Earthman—she thought of the matter in capitals—appealed to something much more primitive and much more demanding. It roused the sheer animal curiosity in her.

It was a mystery!

There were three points that fascinated her. Among these was not the perhaps reasonable question—under the circumstances—of whether the man's story was a delusion or a deliberate lie, rather than the truth. To believe it anything other than truth would spoil the mystery and Samia could not allow that.

The three points were therefore these: 1) What was the danger that threatened Florina, or, rather, the entire galaxy? 2) Who was the person who had psycho-probed the Earth-

man? 3) Why had the person used the psycho probe?

She was determined to sift the matter to her own thorough satisfaction. No one is so modest as not to believe himself a competent amateur sleuth, and Samia was far from modest.

As soon after dinner as she could politely manage, she hurried down to the brig.

She said to the guard, "Open the door!"

The sailor remained perfectly erect, staring blankly and respectfully ahead. He said, "If your ladyship pleases, the door is not to be opened."

Samia gasped. "How dare you say so? If you do not open the door instantly, the captain shall be informed."

"If your ladyship pleases, the door is not to be opened. That is by the strict order of the captain."

She stormed up the levels once more, bursting into the captain's stateroom like a tornado compressed into sixty inches.

"Captain!"

"My lady?"

"Have you ordered the Earthman and the native woman to be kept from me?"

"I believe, my lady, it was agreed that you were to interview them only in my presence."

"Before dinner, yes. But you saw they were harmless?"

"I saw that they *seemed* harmless."

Samia simmered, "In that case, I order you to come with me now."

"I cannot, my lady. The situation has changed."

"In what way?"

"They must be questioned by the proper authorities on Sark and until then I think they should be left alone."

Samia's lower jaw dropped, but she rescued it from its undignified position almost immediately. "Surely you are not going to deliver them to the Bureau of Florinian Affairs."

"Well," temporized the captain, "that was certainly the original intention. They have left their village without permission. In fact, they have left their planet without permission. In addition, they have taken secret passage on a Sarkite vessel."

"The last was a mistake."

"Was it?"

"In any case, you knew all their crimes before our last interview."

"But it was only at the interview that I heard what the so-called Earthman had to say."

"So-called. You said yourself that the planet Earth existed."

"I said it might exist. But, my lady, may I be so bold as to ask what you would like to see done with these people?"

"I think the Earthman's story should be investigated. He speaks of a danger to Florina and of someone on Sark who has deliberately attempted to keep knowledge of that danger from the proper authorities. I think it is even a case for my father. In fact, I would take him to my father,

when the proper time came."

The captain said, "The cleverness of it all!"

"Are you being sarcastic, captain?"

The captain flushed, "Your pardon, my lady. I was referring to our prisoners. May I be allowed to speak at some length."

"I don't know what you mean by 'some length,'" she retorted angrily, "but I suppose you may begin."

"Thank you. In the first place, my lady, I hope you will not minimize the importance of the disturbances on Florina."

"What disturbances?"

"You cannot have forgotten the incident in the library."

"A Patroller killed! Really, captain!"

"And a second Patroller killed the morning after, my lady, and a native as well. It is not very usual for natives to kill Patrollers and here is one who has done it twice, and yet remains uncaught. Is he a lone hand? Is it an accident? Or is it all part of a carefully-laid scheme?"

"Apparently you believe the last."

"Yes, I do. The murdering native had two accomplices. Their description is rather like that of our two stowaways."

"You never said so!"

"I did not wish to alarm your ladyship. You'll remember, however, that I told you repeatedly that they could be dangerous."

"Very well. What follows from all this?"

"What if the murders on Florina were simply side shows intended to distract the attention of the Patroller squadrons while these two sneaked aboard our ship?"

"That sounds so silly."

"Does it? Why are they running away from Florina? We haven't asked them. Let us suppose they are running away from the Patrollers since that is certainly the most reasonable assumption. Would they be running to Sark of all places? And on a ship that carries your ladyship? And then he claims to be a spatioanalyst."

Samia frowned. "What of that?"

"A year ago a spatioanalyst was reported missing. The story was never given wide publicity. I knew, of course, because my ship was one of those that searched near space for signs of his ship. Whoever is backing these Florinian disorders has undoubtedly seized on that fact, and just knowing that the matter of the missing spatioanalyst is known to them shows what a tight and unexpectedly efficient organization they have."

"It might be that the Earthman and the missing spatioanalyst have no connection."

"No real connection, my lady, undoubtedly. But to expect no connection at all is to expect too much of coincidence. It is an impostor we are dealing with. That is why he claims to have been psycho-probed."

"Oh?"

"How can we prove he *isn't* a spatio-analyst? He knows no details of the planet Earth beyond the bare fact that it is radioactive. He cannot pilot a ship. He knows nothing of spatio-analysis. And he covers up by insisting he was psycho-probed. Do you see, my lady?"

Samia could make no direct answer. "But to what purpose?" she demanded.

"So that you might do exactly what you said you intended to do, my lady."

"Investigate the mystery?"

"No, my lady. Bring the man to your father."

"I still see no point."

"There are several possibilities. At the best, he could be a spy upon your father, either for Florina or possibly for Trantor. I imagine old Abel of Trantor would certainly come forward to identify him as an Earthman, if for no other reason than to embarrass Sark by demanding the truth concerning this fictitious psycho-probing. At the worst, he will be your father's assassin."

"Captain!"

"My lady?"

"This is ridiculous!"

"Perhaps, my lady. But if so, the Department of Security is also ridiculous. You will recall that just before dinner I was called away to receive a message from Sark."

"Yes."

"This is it."

Samia received the thin translucent foil with its red lettering. It said: "Two Florinians are reported to have taken secret, illegal passage on your ship. Secure them immediately. One of them may claim to be a spatio-analyst and not a Florinian native. You are to take no action in this matter. You will be held strictly responsible for the safety of these people. They are to be held for delivery to Depsec. Extreme secrecy. Extreme urgency."

Samia felt stunned. "Depsec," she said. "The Department of Security."

"Extreme secrecy," said the captain. "I stretch a point to tell you this, but you have left me no choice, my lady."

She said, "What will they do to him?"

"I cannot say for certain," said the captain. "Certainly, a suspected spy and assassin cannot expect gentle treatment. Probably his pretense will become partly a reality and he will learn what a psycho probe is really like."

XII.

The four Great Squires regarded the Squire of Fife each in his own way. Bort was angry, Rune was amused, Balle was annoyed, and Steen was frightened.

Rune spoke first. He said, "High treason? Are you trying to frighten us with a phrase? What does it mean?

Treason against you? Against Bort? Against myself? By whom and how? And for Sark's sake, Fife, these conferences interfere with my normal sleeping hours."

"The results," said Fife, "may interfere with many sets of sleeping hours. I don't refer to treason against any of us, Rune. I mean treason against Sark."

Bort said, "Sark? What's that, anyway, if not us?"

"Call it a myth. Call it something ordinary Sarkites believe in."

"I don't understand," moaned Steen. "You men always seem so interested in talking each other down. Really! I wish you'd get all this over with."

Balle said, "I agree with Steen." Steen looked gratified.

Fife said, "I'm perfectly willing to explain immediately. You have heard, I suppose, of the recent disturbances on Florina."

Rune said, "The Depsec dispatches speak of several Patrollers killed. Is that what you mean?"

Bort broke in angrily. "By Sark, if we must have a conference, let's talk about that. Patrollers killed! They deserve to be killed! Do you mean to say a native can simply come up to a Patroller and bash his head in with a two-by-four? Why should any Patroller let any native with a two-by-four in his hand come close enough to use it? Why wasn't the native burned down at twenty paces?

"By Sark, I'd rattle the Patrol Corps from captain to recruit and send every dunderhead out on ship duty. The entire Corps is just an accumulation of fat. It's too easy a life for them down there. I say that every five years we should put Florina under martial law and scrape out the troublemakers. It would keep the natives quiet and our own men on their toes."

"Are you through?" asked Fife.

"For now, yes. But I'll take it up again. It's my investment down there, too, you know. It may not be as big as yours, Fife, but it's big enough for me to worry about."

Fife shrugged. He turned suddenly to Steen. "And have *you* heard of the disturbances?"

Steen jumped. "I have. I mean, I've heard you just saying—"

"You haven't read the Depsec announcements."

"Well, really!" Steen became intensely interested in his long, pointed fingernails with their exquisitely applied coppery coating. "I don't always have time to read *all* the announcements. I didn't know it was required of me. In fact," and he gathered his courage in both hands and looked full at Fife, "I didn't know you were making rules for me. Really!"

"I haven't," said Fife. "Just the same since you, at least, know none of the details, let me summarize it for you. The rest may find it interesting as well."

It was surprising into how few words

the events of forty-eight hours could be put and how flatly they could sound. First, there had been an unexpected reference to spatioanalysis texts. Then a blow on the head of a superannuated Patroller who died of a fractured skull two hours later. Then a pursuit that ended with untouchability in the lair of a Trantorian agent. Then a second Patroller dead at dawn with the murderer tricked out in the Patroller's uniform and the Trantorian agent dead in his turn some hours later.

"If you wish the very latest nugget of news," Fife concluded, "you might add this to this catalogue of apparent trivia. Three hours ago, a body, or rather, the bony remnants of one, was found in City Park on Florina."

"Whose body?" asked Rune.

"No identification yet. Lying next to it, however, was a pile of ash that seemed to be the charred remnants of clothing. Anything of metal had been carefully removed from it, but the ash analysis proved it to be what was left of a Patroller uniform."

"Our impostoring friend?" asked Balle.

"Not likely," said Fife. "Who would kill him in secret?"

"Suicide," said Bort, viciously. "How long did the fool expect to keep out of our hands? I imagine he had a better death this way. Personally, I'd find out who in the Corps were responsible for letting him reach the suicide stage and put a one-charge blaster in *their* hands."

"Not likely," said Fife, again. "If the man committed suicide, he either killed himself first, then took off his uniform, blasted it to ash, removed the buckles and braid, and then got rid of them. Or else, he first removed his uniform, ashed it, removed the buckles and braid, left the cave naked, or perhaps in his underwear, discarded them, came back and killed himself."

"The body was in a cave?" asked Bort.

"In one of the ornamental caves of the park. Yes."

"Then he had plenty of time, and plenty of privacy," said Bort, belligerently. He hated to give up a theory. "He could have taken off the buckles and braid first, then—"

"Ever try to remove braid from a Patroller uniform that hasn't been ashed first?" asked Fife, sarcastically. "And can you suggest a motive, if the body were that of the impostor after suicide. Besides I have a report from the medical examiners who studied the bone structure. The skeleton is that of neither a Patroller nor a Florinian. It is of a Sarkite."

Steen cried, "Really!" Balle's old eyes opened wide. Rune's metal teeth, which, by catching a gleam of light now and then, added a bit of life to the cube of dusk in which he sat, vanished as he closed his mouth. Even Bort was dumfounded.

"Do you follow?" asked Fife. "Now

you see why the metal was removed from the uniform. Whoever killed the Sarkite wanted the ash to be taken for that of the Sarkite's own clothing, removed and ashed before the killing, which we might then take for suicide or for the result of a private feud in no way connected with our Patroller-impostoring friend. What he did not know was that ash analysis could distinguish between the *kyrt* of Sarkite clothing and the cellulite of a Patroller uniform.

"Now given a dead Sarkite and the ash of a Patroller uniform, we can only assume that somewhere in Upper City there is a live Townman in Sarkite clothing. Our Florinian, having posed as a Patroller long enough, and finding the danger too great and growing greater, decided to become a Squire. And he did that in the only way he could."

"Has he been caught?" inquired Bort, thickly.

"No, he hasn't."

"Why not? By Sark, why not?"

"He will be caught," said Fife, indifferently. "At the moment we have more important things to wonder about. This last atrocity is a trifle in comparison."

"Get to the point!" demanded Rune, instantly.

"Patience! First, let me ask you if you remember the missing spatio-analyst of last year."

Steen giggled.

Bort said, with infinite contempt, "That again?"

Steen asked, "Is there a connection? Or are we just going to talk about that horrible affair of last year all over again? I'm tired."

Fife was unmoved. He said, "This explosion of yesterday and day before yesterday began with a request at the Florinian library for reference books on spatioanalysis. That is connection enough for me. Let's see if I can't make it connection for the rest of you as well. I will begin by describing the three people involved in the library incident and please, let me have no interruptions for a few moments.

"First, there is a Townman. He is the dangerous one of the three. On Sark, he had an excellent record as an intelligent and faithful piece of material. Unfortunately, he has now turned his abilities against us. He is undoubtedly the one responsible for four killings now. Quite a record for anyone. Considering that the four include two Patrollers and a Sarkite, it is unbelievably remarkable for a native. And he is still uncaught.

"The second person involved is a native woman. She is uneducated and completely insignificant. However, the last thirty-six hours has seen an extensive search into every facet of this affair and we know her history. Her parents were members of the 'Soul of *Kyrt*' if any of you remember that rather ridiculous peasant conspiracy that was wiped out without trouble

some twenty years ago.

"This brings us to the third person, the most unusual one of the three. This third person was a common mill hand and an idiot."

There was an expulsion of breath from Bort and another high-pitched giggle from Steen. Balle's eyes remained closed and Rune was motionless in the dark.

Fife said, "The word 'idiot' is not used figuratively. Depsec has driven itself mercilessly but his history could not be traced back more than ten and a half months. At that time he was found in a village just outside Florina's main metropolis in a state of complete mindlessness. He could neither walk nor talk. He could not even feed himself.

"Now note first that he made this first appearance some few weeks after the disappearance of the spatioanalyst. Note in addition that, in a matter of months, he learned how to talk and even how to fill a job at a *kyrt* mill. What kind of an idiot could learn so quickly?"

Steen began, almost eagerly, "Oh, really, if he were psycho-probed properly, it could be arranged so—"

His voice trailed off.

Fife said, sardonically, "I can think of no greater authority on the subject. Even without Steen's expert opinion, however, the same thought occurred to me. It was the only possible explanation.

"Now the psycho-probing could have taken place only on Sark or in Upper City on Florina. As a matter of simple thoroughness, doctor's offices in Upper City were checked. There was no trace of any unauthorized psycho-probing. It was then the notion of one of our agents to check the records of doctors who had died since the idiot first made his appearance. I shall see to it that he is promoted for that idea.

"We found a record of our idiot in just one of those offices. He had been brought in for a physical check-up about six months ago by the peasant woman who is the second of our trio. Apparently, this was done secretly since she was absent that day from her job on quite another pretext. The doctor examined the idiot and recorded definite evidence of psycho-probic tampering.

"Now here is the interesting point. The doctor was one of those who kept double-deck offices in Upper City and Lower City. He was one of these idealists who thought the natives deserved first-rate medical care. He was a methodical man and kept duplicate records in full in both his offices to avoid unnecessary elevator travel. Also it pleased his idealism, I imagine, to practice no segregation between Sarkite and Florinian in his files. But the record of the idiot in question was not duplicated, and it was the *only* record not duplicated.

"Why should that be? If, for some reason, he had decided of his own accord not to duplicate that particular

record, why should it have appeared only in the Upper City records, which is where it did appear? Why not only in the Lower City records, which is where it did not appear? After all, the man was a Florinian. He had been brought in by a Florinian. He had been examined in the Lower City office. All that was plainly recorded in the copy we found.

"There is only one answer to that particular puzzle. The record *was* duly entered in both files, but it was destroyed in the Lower City files by somebody who did not realize there would remain another record in the Upper office. Now let's pass on.

"Included with the idiot's examination record, was the definite notation to include the findings of this case with the doctor's next routine report to Depsec. That was entirely proper. Any case of psycho-probing could involve a criminal or even a subversive. But no such report was ever made. Within the week, he was dead in a traffic accident.

"The coincidences pile up past endurance, don't they?"

Balle opened his eyes. The "whites" were an unpalatable yellow. He said, "This is a detective thriller you are telling us."

"Yes," cried Fife, with satisfaction, "a detective thriller. And for the moment, I am the detective."

"And who are the accused?" asked Balle, in a tired whisper.

"Not yet. Let me play the detective for a moment longer."

In the middle of what Fife considered to be the most dangerous crisis that had ever confronted Sark, he suddenly found himself enjoying himself hugely.

He said, "Let's approach the story from the other end. We will, for the moment, forget the idiot and remember the spatioanalyst. The first we hear of him is the notification to the Bureau of Transportation that his ship will soon land. A message received from him earlier accompanies the notification.

"The spatioanalyst never arrives. He is located nowhere in near space. Furthermore, the message sent by the spatioanalyst which had been forwarded to BuTrans had disappeared. The I.S.B. claimed that we were deliberately concealing the message. Depsec believed that they were inventing a fictitious message for propaganda purposes. It now occurs to me that we were both wrong. The message *had* been delivered but it had *not* been concealed by the government of Sark.

"Let us invent someone and, for the moment, call him X. X has access to the records of BuTrans. He learns of this spatioanalyst and his message and has the brains and ability to act quickly. He arranges that a secret subethergram be sent out to the spatioanalyst's ship, directing the man's landing on some small, private field. The spatioanalyst does so and X meets

him there.

"X has taken the spatioanalyst's message of doom with him. There may be two reasons for that. First, it would confuse possible attempts at detection by eliminating a piece of evidence. Second, it would serve, perhaps, to win the confidence of the mad spatioanalyst. If the spatioanalyst felt he could talk only to his own superiors, and he might well feel that, X might persuade him to grow confidential by proving that he was already in possession of the essentials of the story.

"Undoubtedly the spatioanalyst talked. However incoherent, mad, and generally impossible that talk might have been, X recognized it as an excellent handle for propaganda. He sent out his blackmailing letter to the Great Squires, to us. His procedure, as then planned, was probably precisely that which I attributed to Trantor at the time. If we didn't come to terms with him, he intended to disrupt Florinian production by rumors of destruction until he forced surrender.

"But then came his first miscalculation. Something frightened him. We'll consider exactly what that was later. In any case, he decided he would have to wait before continuing. Waiting, however, involved one complication. X didn't believe the spatioanalyst's story, but there is no question that the spatioanalyst himself was madly sincere. X would have to arrange affairs so that the spatioanalyst would be willing to allow his 'doom' to wait.

"The spatioanalyst could not do that unless his warped mind was put out of action. X might have killed him, but I am of the opinion that the spatioanalyst was necessary to him as a source of further information—after all, he knew nothing of spatioanalysis himself and he couldn't conduct successful blackmail on total bluff—and, perhaps, as ransom in case of ultimate failure. In any case, he used a psychoprobe. After treatment, he had on his hands, not a spatioanalyst, but a mindless idiot who would, for a time, cause him no trouble. And after a time, his senses would be recovered.

"The next step? That was to make certain that during the year's wait, the spatioanalyst would not be located, that no one of importance would see him even in his role as idiot. So he proceeded with a masterly simplicity. He carried his man to Florina and for nearly a year the spatioanalyst was simply a half-wit native, working in the *kyrt* mills.

"I imagine that during that year, he, or some trusted subordinate, visited the town where he had 'planted' the creature, to see that he was safe and in reasonable health. On one of these visits he learned, somehow, that the creature had been taken to a doctor who knew a psycho-probing when he saw one. The doctor died and his report disappeared, at least from his Lower City office. That was X's first miscalculation. He never thought a duplicate might be in the office

above.

"And then came his second miscalculation. The idiot began regaining his senses a little too quickly and the village Townman had brains enough to see that there was something more to it than simple raving. Perhaps the girl who took care of the idiot told the Townman about the psycho-probing. That's a guess.

"There you have the story."

Fife clasped his strong hands and waited for the reaction.

Rune supplied it first. The light had turned on in his cubicle some moments earlier and he sat there, blinking and smiling. He said, "And a moderately dull story it was, Fife. Another moment in the dark and I would have been asleep."

"As nearly as I can see," said Balle, slowly, "you have created a structure as insubstantial as the one of last year. It is nine-tenths guesswork."

"Hogwash!" said Bort.

"Who is X, anyway?" asked Steen. "If you don't know who X is, it just doesn't make any sense." And he yawned delicately, covering his small, white teeth with a bent forefinger.

Fife said, "At least one of you sees the essential point. The identity of X is the nub of the affair. Consider the characteristics that X must possess if my analysis is accurate.

"In the first place, X is a man with contacts in the Civil Service. He is a man who can order a psycho-probing. He is a man who thinks he can arrange a powerful blackmailing campaign. He is a man who can take the spatio-analyst from Sark to Florina without trouble. He is a man who can arrange the death of a doctor on Florina. He isn't a nobody, certainly.

"In fact, he is a very definite somebody. He must be a Great Squire. wouldn't you say so?"

Bort rose from his seat. His head disappeared and he sat down again. Steen burst into high, hysterical laughter. Rune's eyes, half-buried in the pulpy fat that surrounded them, glittered feverishly. Balle slowly shook his head.

Bort yelled, "Who in Space is being accused, Fife?"

"No one yet." Fife remained even-tempered. "No one specifically. Look at it this way. There are five of us. Not another man on Sark could have done what X did. Only we five. That can be taken as settled. Now which of the five is it? To begin with, it isn't myself."

"We can take your word for it, can we?" sneered Rune.

"You don't have to take my word for it," retorted Fife. "I'm the only one here without a motive. X's motive is to gain control of the *kyrt* industry. I *have* control of it. I own a third of Florina's land outright. My mills, machine plants and shipping fleets are sufficiently predominant to force any or all of you out of business if I wish. I wouldn't have to resort to com-

plicated blackmail."

He was shouting over their united voices. "Listen to me! The rest of you have every motive. Rune has the smallest continent and the smallest holdings. I know he doesn't like that. He can't pretend he likes it. Balle has the oldest lineage. There was a time when his family ruled all of Sark. He probably hasn't forgotten that. Bort resents the fact that he is always outvoted in Council and cannot therefore conduct business in his territories in quite the whip-and-blaster fashion he would like. Steen has expensive tastes and his finances are in a bad way. The necessity of recouping is a hard-driving one. We have it there. All the possible motives. Envy. Greed for power. Greed for money. Questions of prestige. Now which of you is it?"

There was a gleam of sudden malice in Balle's old eyes, "You don't know?"

"It doesn't matter. Now hear this. I said that something frightened X—let's still call him X—after his first letters to us. Do you know what it was? It was our first conference when I preached the necessity of united action. X was here. X was, and is, one of us. He knew united action meant failure. He had counted on winning over us because he knew that our rigid ideal of continental autonomy would keep us at odds to the last moment and beyond. He saw that he was wrong and he decided to wait until the sense of urgency vanished and he could proceed again.

"But he is still wrong. We will still take united action and there is only one way we can do it safely considering that X is one of us. Continental autonomy is at an end. It is a luxury we can no longer afford, for X's schemes will end only with the economic defeat of the rest of us or the intervention of Trantor. I, myself, am the only one I can trust, so from now on, I head a united Sark. Are you with me?"

They were out of their seats, shouting. Bort was waving his fist. There was a light froth at the corner of his lips.

Physically, there was nothing they could do. Fife smiled. Each was a continent away. He could sit behind his desk and watch them foam.

He said, "You have no choice. In the year since our first conference, I, too, have made my preparations. While you four have been quietly in conference, listening to me, officers loyal to myself have taken charge of the navy."

"Treason!" they howled.

"Treason to continental autonomy," retorted Fife. "Loyalty to Sark."

Steen's fingers intertwined nervously, their ruddy, copper tips the only splash of color upon his skin. "But it's X. Even if X is one of us, there are three innocent. I'm not X." He cast a poisonous glance about him. "It's one of the others."

"Those of you who are innocent

will form part of my government if they wish. They have nothing to lose."

"But you won't say who is innocent," bawled Bort. "You will keep us all out on the story of X, on the . . . on the—" Breathlessness brought him to a halt.

"I will not. In twenty-four hours, I will know who X is. I have not told you. The spatioanalyst we have all been discussing is now in my hands."

They fell silent. They looked at one another with reserve and suspicion.

Fife chuckled. "You are wondering which of you can be X. One of you knows, be sure of that. And in twenty-four hours, we shall all know. Now keep in mind, gentlemen, that you are all quite helpless. The ships of war are mine. Good day!"

His gesture was one of dismissal.

One by one they went out, like stars in the depths of the vacuum being blotted out on the visiplate by the passing and unseen bulk of a wrecked spaceship.

Steen was the last to leave. "Fife," he said, tremulously.

Fife looked up. "Yes? You wish to confess now that we two are alone? You are X?"

Steen's face twisted in wild alarm. "No, no. Really. I just wanted to ask if you're really serious. I mean, continental autonomy and all that. Really?"

Fife stared at the old chronometer on the wall. "Good day."

Steen whimpered. His hand went up to the contact switch and he, too, disappeared.

Fife sat there, stony and unmoving. With the conference over, the heat of the crisis gone, depression seized him. His lipless mouth was a severe gash in his large face.

All calculations began with this fact; that the spatioanalyst was mad, there was no doom. But over a madman, so much had taken place. Would Junz of the I.S.B. have spent a year searching for a madman? Would he be so unyielding in his chase after fairy stories?

Fife told no one this. He scarcely dared share it with his own soul. What if the spatioanalyst had never been mad? What if destruction dangled over the world of *kyrt?*

The Florinian secretary glided before the Great Squire, his voice pallid and dry.

"Sir!"

"What is it?"

"The ship with your daughter has landed."

"The spatioanalyst and the native woman are safe?"

"Yes, sir."

"Let there be no questioning in my absence. They are to be held incommunicado until I arrive. Is there news from Florina?"

"Yes, sir. The Townman is in custody and is being brought to Sark."

TO BE CONCLUDED

THE REFERENCE LIBRARY

BY P. SCHUYLER MILLER

JUNIOR DIVISION

The young occupy an ambiguous place in our technological society—one which the onslaught of Space may clarify, and change.

If you develop the habit of reading tombstones around and about the older portions of our—and I suspect anyone's—country, you will soon find that one hundred, two hundred, three hundred years ago the men and women who were hewing a new world out of the wilderness and a new society out of feudalism were often in their late 'teens or early twenties. Before that they had been doing a long day's work in the fields or in a home craft shop, at wages—if any—and hours which would bring on an instant strike if they were offered to an adult today. Childhood ended pretty soon for these young people, and it still ends as soon or sooner for boys and girls in many parts of this not wholly mechanized planet.

In the last analysis, the hazy dividing line between childhood and adult status is defined more by society—by culture—than by physiology. Over a generation or more we have been prolonging this social or societal childhood well beyond the point where boys and girls are physically men and women. Leave it to the sociologists to explain how and why it happened. Reaction to the slaughter of young men in the first World War—then, suddenly, depression in which the young must be

kept from competing with their elders in the labor market—then, again, world holocaust; things like these, it would seem, wrought the change. But we have a world now in which young men and women, no longer pulled down by malnutrition and disease, come into their physical prime but are held in a kind of suspended animation by a society which can think of nothing useful for them to do except go on being children.

Space is going to change this. The men who pilot rockets among the worlds are going to have to be at top physical pitch, their reaction time at its shortest, their bodies fresh and hard, their minds alert. They'll need judgment and experience, but they'll get it the way the pioneer did when he hacked a house lot out of the forest, put in a crop, raised a cabin and a son or two, and fought off the Indians or, if he was smart, made friends with them. Chances are that they'll find their childhood shortened—early selection tests, relentless screening, intensive psychological and scholastic training, so that a measure of mental maturity and technical knowledge will come at the same time as bodily readiness for Space. Maybe, as at least one of the writers in the new Winston Science-Fiction series suggests, they'll be back on Earth, used up and retired to desk work, at twenty-five. Maybe they'll be in Congress, or in the White House, or the Assembly of the United Nations—a U.N. in which the Moon colony, and Mars, and maybe Venus and the satellites of Jupiter are bidding for membership and a voice in the government of a race suddenly turned young again.

If you have read Robert Heinlein's series of top-notch juvenile science-fiction novels—"Rocket Ship Galileo," "Space Cadet," "Red Planet," "Farmer in the Sky," "Between Planets"—you must have sensed this emphasis on the increasingly important part young people must play in our tomorrows. It is also the unifying theme in at least four of the five books in the new Winston series. These are juvenile books, written about teen-agers for teen-agers, and they can't be as unreservedly recommended to adult readers as can all of the Heinlein series—except perhaps "Rocket Ship Galileo"—or Malcolm Jameson's "Bullard of the Space Patrol," which took the 1952 Science-Fiction Award of the Boys' Clubs of America but which was considered adult enough fare when the episodes originally appeared here in ASF. But they are for the most part well done, by authors who know science fiction, and they can be recommended to any young person who isn't too impatient to claim his—or her—birthright in the stars.

The best of the five books are by top-notch practitioners of science-fiction who are, so far as I know, writing for young people for the first time. They are Lester del Rey's "Marooned on Mars" (John C. Winston Company,

Philadelphia. 1952 210 pp. $2.00) and Raymond F. Jones' "Son of the Stars" (Winston, Ibid.). Of these, the second is made most timely by the renewed flying saucer headlines. Clonar, six-fingered, brown skinned, able to communicate with dogs, is the sole survivor of a wrecked saucer. He is found and befriended by the young people of a small California town, but promptly comes up against the prejudices and fears of the adult community and of the military authorities. After all, how can we assume that an alien from the stars will be anything but an enemy? This is far from the black-and-white, "good guys versus bad guys" plotting of the old-fashioned juveniles on which most of us were weaned—Roy Rockwood and "Tom Swift."

The same touch of reality is in Del Rey's "Marooned on Mars" and Philip Latham's "Five Against Venus" (214 pp.). Chuck Svensen, just under eighteen, is done out of a place on the first Mars expedition by a technicality. He stows away, but when the ship cracks up realizes that this impulsive bit of immaturity is likely to doom the expedition by cutting down its slim margin of food and air. Then native Martians come into the picture, apparently hostile, but Chuck's impulsive willingness to make friends in even the most unlikely places has a profound effect on interplanetary relations.

In the Latham book — and is it a secret that "Philip Latham" is a fictionizing name for R. S. Richardson of Mount Wilson and Palomar?—our protagonists are members of a downrightly ineffectual family who spend more time hoping for miracles than they do working on them. This hasn't quite the smoothness and logic of the first two books, oddly enough: the American family Robinsons' arrival on Venus is about as clumsily and coincidentally explained as Carson Napier's ever was. But indolent, daydreaming Bruce Robinson is no cardboard Tom Swift, and his blunders and half-heroisms are believable.

Milton Lesser's "Earthbound" (208 pp.) is a bit closer to the science fiction of the cartoon books and television shows. Pete Hodges, unjustly broken out of the Solar Academy, goes off in a huff—as he very probably would if he were busted out of West Point or Annapolis under equivalent circumstances today. While the chip is still on his shoulder, he allows himself to be duped into supplying launching data to a gang of space pirates—but again note the modern touch: he's quite obviously a dope from the word go, not the noble but wronged young twerp he would have been a generation ago.

The fifth of the series, Evan Hunter's "Find the Feathered Serpent" (207 pp.) is by a writer I don't know, who has apparently not been willing to do the groundwork on his backgound which the other veteran science-fictioners take on by second nature.

This adds time-travel to the series, which is all to the good, and chooses the Mayan empire in Yucatan as the place to visit—in search of Kukulcan, the white, miracle-working serpent-god of the Mayas and their neighbors. It's a venerable theme, mixing in Norse wanderers with the time-travelers, but it is full of little careless flaws which readers are going to spot, and which are going to give the book and by association the series a bad name for, shall we say, plausibility. Chichen Itza, which Neil Falsen and his friends visit, is by no means a seacoast city—a Rand McNally "Road Atlas" shows it a good sixty miles from the sea, and there are plenty of other, though less publicized cities which would fill the bill. In one of the big payoff scenes the Viking leader, ca. 400 A.D., knows maize and introduces it to the Mayas by salvaging kernels from the rattles of a tribe of sub-civilized barbarians. The rattling you hear comes from the dry bones of generations of archeologists twirling in their crypts—even Le Plongeon would groan at that one, I think.

How does all this add up? Winston is a publisher with long experience in juvenile books. Winston books furnish a solid and reliable core in many a school and public library. These publishers know what young people of junior high and high school age want to read—they know that it is important to get writers who know what they are doing—and they know that you can't grind out the old Victorian brand of formula-yarn any more. As editor of the series they have Cecile Hulse Matschat, writer, artist, and historian, with an assist from an even better-known writer-editor, Carl Carmer. From these people you can count on good books, strikingly attractive jackets, and a brand of story which will pick up young readers from the comics and pass them on with more exacting tastes to Heinlein and the adult magazines and books. The Winston name, coupled with Matschat and Carmer, will get these books acceptance from librarians and parents who never heard of Lester del Rey, Raymond Jones, or R. S. Richardson. The Heinlein books are in a class by themselves, but these five—and the rest which we can hope will keep coming—will probably win more readers to good science fiction, and do more to give it a solid foundation in junior literature, than anything of the kind that has yet appeared.

MURDER IN MILLENNIUM VI, by Curme Gray. Shasta Publishers, Chicago. 1952. 249 pp. $3.00

Science fiction has yet to be successfully blended with the detective story, except in one or two rare short stories, but Shasta has chosen such a hybrid to introduce a new writer who makes an interesting try.

After five thousand seven hundred and two years of unadulterated Matri-

archy, in which immortality has been achieved, men bred into an abject class of domestic pets and drudges, and a fantastic cult of organized ignorance built up to support the status quo, death suddenly reappears in the form of double murder—first of the Matriarch herself, then of a male, with other violence ("irregularity," that is) to follow. Our hero and herione—throwbacks to the physiques and reactions of our own time—have first to puzzle out the most elementary principles of crime and detection before they can make sense out of what is happening.

By detectival standards, all this is unfair to organized readers. The bewildering strangeness of background and relationship make it impossible for the reader to "beat" the plot or outguess the author, or even to guess how the people of the story will act or think under a given stimulus. A new murder method is derived from the setting, but little if any foundation is laid for it—which will not endear the book to Ellery Queen, Anthony Boucher, or the Mystery Writers of America. Still, there is certainly a growing fascination in the situation as it unravels—or rather entangles itself—which is rather effective.

If a setting like that in Fritz Leiber's "Coming Attraction" ("Galaxy Reader of Science Fiction," pp. 30–40)—which can't be beat for unadulterated venomous decadence in a picture of the future—were to be used as the setting for a crime novel, we might for the first time really beat the jinx which hangs over science-fictional detection. That has a subtlety which Gray's story lacks. "Murder in Millennium VI" reminds me more of the preposterously entertaining concoctions with which Harry Stephen Keeler used to amaze and exasperate the faithful.

COAK OF AESIR, by John W. Campbell, Jr. Shasta Publishers, Chicago. 1952. 255 pp. $3.00

John Campbell's first short-story collection—as Don A. Stuart—"Who Goes There?" made the *Arkham Sampler* poll of the seventeen best science fiction books of all time, made an excellent motion picture, and has gone into a second edition. "Cloak of Aesir" is top-notch stuff from the growing-pains period of science fiction, but it isn't as good as its predecessor.

Campbell as "Stuart" was deliberately creating a new style and a new approach to science fiction, while as himself he was rolling out excellent examples of the prevailing mode of crazy-animal or ultra-super-physics yarn. The tales of the Gernsback era had sought to teach science through fiction; the stories of Don A. Stuart offered philosophical quirks on the possible future of man and his works. Some of them tended to be sermons rather than stories, and the triology brought together here as "The Story of the Machine" suffers from this fact. In "The Machine," a seemingly high level of civilization comes crashing

down when the Machine from Space stops running; in "The Invaders" mankind makes a strange sort of comeback under the oppression of alien rule; and in "Rebellion" the circle is complete, or nearly so. The lesson is deftly worked out: the story values a bit less so.

The two shorter stories which open the book present other neat thought-variants on the future of Man. In "Forgetfulness" there is the provoking question: what makes civilization? In "The Escape," which follows, the question is perhaps, "What makes happiness?"

Nearly half the book—the last half—is devoted to the two stories of the Sarn Mother, matriarch of another race of successful invaders of Earth, and the eventual human revolt against Sarn rule. These—"Out of Night" and "Cloak of Aesir"—do seem to me to be in the company of the tales in "Who Goes There?", and good company it is. The pair end in a kind of victory for humanity, but in the earlier stories we have seen victories turn pyrrhic, to say the least.

"Don A. Stuart," says John W. Campbell, Jr., in his introduction, "was an uncomfortable sort of fellow for the dyed-in-the-wool, straight science-fictioner. But the vistas that opened up when you started looking at the other side of the coin—considering whether an accepted tenet of The Eternal Fitness of Things really *did* fit—made for a lot more fun."

THE HAPLOIDS, by Jerry Sohl. Rinehart & Co., New York. 1952. 248 pp. $2.50

If you are up on your biology, the title of this science-fictive mystery by a new writer should just about give away the who and why of the plot.

Actually, it adds up to a pretty good world-menace yarn of the type Sax Rohmer, E. Phillips Oppenheim, J. S. Fletcher, and others made popular in the 1920s, but written with the speed and smoothness of today. Newspaperman Gibson Travis is in a hospital when the first of the doomed males is brought in; victim of a hideous new disease fatal only to his sex. He almost catches the mysterious blonde who slips into the hospital to give the dying man a hypodermic of strychnine. He catches up with her again, and is slugged. Meanwhile the strange new plague is spreading, and new centers of infection are turning up.

Often—as in Curme Gray's "Murder in Millennium VI"—these hybrid science-fiction detective stories are so burdened with atmosphere as to be insoluble to the mere reader. Here you have the two essential clues from the start: the title—which is more than Travis has—and the cryptic symbol left by the first victim, the characters "23X" enclosed in the loop of the old astrological symbol for the planet Venus. From there on it's a standard chase—in which, it so happens, the chased are the chaste.

IMAGINATION UNLIMITED, edited by Everett F. Bleiler & T. E. Dikty. Farrar, Straus and Young, New York. 1952. 430 pp. $3.50

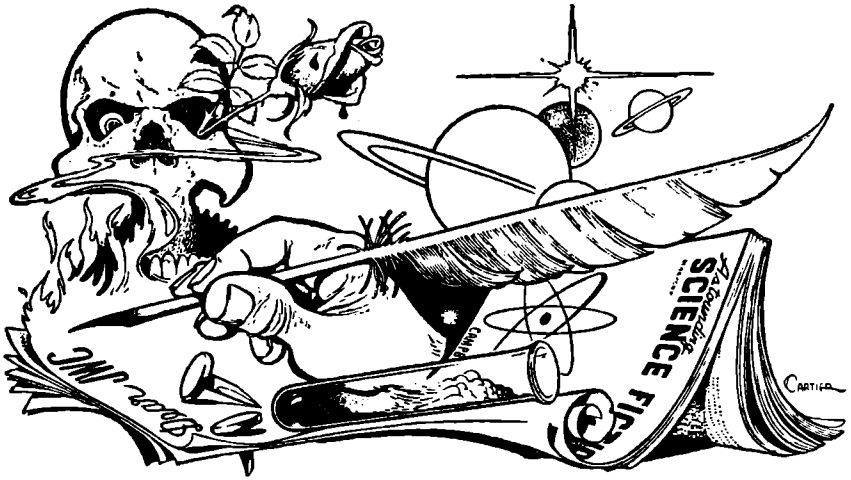
Since it is by now obvious that 1952 will swamp 1951 so far as anthologies are concerned, it is nice to be able to report that some of them are good. Guaranteeing that the stories will be unfamiliar, or even that they won't have been previously anthologized in the last collection but one, something else again.

The reliable Bleiler-Dikty combination is introducing another major publisher to the science-fiction field with a collection built around more or less scientific concepts: two on mathematics and philosophy, four on the physical sciences, three for the biological sciences, and a closing section of four stories for the social sciences. Only three of the lot are from other magazines than this.

Mathematics is represented by Theodore Sturgeon's Mobius strip tale, "What Dead Men Tell," and philosophy by a disturbing little story from Ray Bradbury, "Referent." For geology we find Malcolm Jameson's "Blind Man's Buff," a fascinatingly detailed story of the struggle to map and occupy Venus. Chemistry, toughest of the sciences to turn into fiction, is represented by the poorest of the lot, Ross Rocklynne's "Pressure," and physics by Philip Latham's grim little tale of astronomical inevitability, "The Xi Effect". Astronomy—that is, interplanetary communication—brings one of the two oldest stories in the collection, Raymond Z. Gallun's "Old Faithful" of 1934. This is followed immediately, in the biological pigeonhole, by Harry Bates' memorable and much-reprinted "Alas, All Thinking!" of 1935. Bates' story is followed in turn by the recently published "Dune Roller," by Julian May, standing for biochemistry. A minor de Campian comedy, "Employment," in which assorted extinct creatures are rebuilt from their fossil bones, concludes the biological section pleasantly.

Three of the four stories in the concluding section on the social sciences date from 1951, as might have been expected in view of the trend of current science fiction into this area. Psychology is represented by one slightly older story, Peter Phillips' "Dreams Are Sacred," an entertainment almost in the de Camp-Pratt manner. Kris Neville contributes "Hold Back Tomorrow" for sociology, another of the tormenting little stories of children which this rising star does so well. For linguistics we have John Berryman's "Berom," and for anthropology, "The Fire and the Sword," by Frank Robinson, another of the stories which explore variant humanoid societies.

A good job, well done — as if you needed to be told. These editors haven't slipped yet.



BRASS TACKS

Dear Mr. Campbell:

Allow me to put down a few observations on your editorial "Social Pattern," which appeared in the March issue of Astounding.

First of all, I find that you are somewhat vague and oblique in the use of terms which demand the utmost in precision and clarity of thought. For example: ". . . all of us are theoretically versed in the formulae of our Western Christian Cultural Pattern . . ." Ask a dozen people just what that means, and I have an idea you will get twelve surprising answers. But for the time being, those twelve other people can go catch a bus. The question is: Exactly what is in *your* mind when you say "Western Christian Cultural Pattern"? Talk about communication blocks! Why the blatant assumption that your reader will automatically know *precisely* what you mean? In the exchange of ideas the most effective writer is the one who most accurately reproduces his own thought in the mind of his reader. I am not sure that this can be best accomplished by using such undefined terms as "Socio-cultural Contract," et cetera. Of course it all sounds wonderfully profound until some simpleton comes along and asks what it means.

If it were simply a case of finding little or no meaning in some of the terms you have used, then what I have said would come dangerously close to out and out ridicule. But to ask what a thing means does not necessarily imply that it means nothing. On the contrary, there is an abundance of meaning in the mouth-filling "Western Christian Cultural Pattern." The fact is you have said *too* much. And the paradox of all this is that you seem to ignore completely the very thing with which you say "all of us are theoretically familiar."

You mention "the rules of Society and Culture," and you wonder if they have ever been "derived and set down as a system of postulates." Where does that leave the Ten Commandments, the teachings of Christ, the Apostles, and the early Fathers of the Church? Perhaps I misunderstand what you mean by a "system of postulates." (*But let it be made clear that when you get into this "socio-cultural" business, you also involve moral and ethical problems.*) At any event, "the moral code has not varied for ages. It cannot be perfected; it is, or is not. It can be condensed into a small number of rules which appeared as if by miracle in the four corners of the world at different epochs, and derive from that fact a character of universality transcending experience and human intelligence. These rules must be invariable, and their progress can consist only in their diffusion." (Lecomte du Nouy in "Human Destiny".)

This next I can hardly believe. "Pride is a deadly sin. But pride is a sense of strong respect for one's self and one's own accomplishments," et-cetera. (Frantic signal: "Illogical! Illogical!") Why do you find it necessary to force one meaning into two different contexts? The word "pride" in the first sentence has a *distinctly* different meaning from the word "pride" in the second sentence. And only several paragraphs before you correctly stated that "any given word is a symbol, and has relevance only in context." Don't fool yourself: you're not deriving "basic postulates" from anything. You are merely mixed up in a confusion of definitions—or lack of them.

But more important, let's go back again to "Pride is a deadly sin." A statement like that immediately involves you in a moral problem (pride), and more specifically, a theological problem (sin). And both of these, of course, are areas which are not subject to scientific analysis. In fact, your whole business of attempting to derive systematic postulates from what we *ought to* do—Expressed Code—and what we sometimes *actually* do—Reality Code (they are not *always* at variance) is both contradictory and *un*scientific. For these are areas of human experience which are simply beyond the possibility of scientific determination.

". . . Serious consequences have followed the attempt to treat man as if he could be adequately described in scientific terms. So strong is our present partiality for scientific description that many regard nothing as true, or at least significant, that cannot be said in terms of science, and therefore take science to be the proper method of considering man." (F. Sherwood Taylong in "Concerning Science".)

Consequently, it is my opinion that you have set yourself and your readers a quite impossible task. Take, for example, the following socio-cultural pattern (whatever that means):

"Moral sense is almost completely ignored by modern society. We have, in fact, suppressed its manifestations. All are imbued with irresponsibility. Those who discern good and evil, who

are industrious and provident, remain poor and are looked upon as morons. The woman who has several children, who devotes herself to their education, instead of to her own career, is considered weak-minded. If a man saves a little money for his wife and the education of his children, this money is stolen from him by enterprising financiers. Or taken by the government and distributed to those who have been reduced to want by their own improvidence and the shortsightedness of manufacturers, bankers, and economists. Artists and men of science supply the community with beauty, health, and wealth. They live and die in poverty. Robbers enjoy prosperity in peace. Gangsters are protected by politicians and respected by judges. They are the heroes whom children admire at the cinema and imitate in their games. A rich man has every right. He may discard his aging wife, abandon his old mother to penury, rob those who have entrusted their money to him, without losing the consideration of his friends. Homosexuality flourishes. Sexual morals have been cast aside. There is no difference between wrong and right, just and unjust. Criminals thrive at liberty among the rest of the population. No one makes any objection to their presence. Ministers have rationalized religion. They have destroyed its mystical basis. But they do not succeed in attracting modern men. In their half-empty churches they vainly preach a weak morality. They are content with the part of policemen, helping in the interest of the wealthy to preserve the framework of present society. Or, like politicians, they flatter the appetites of the crowd." (Alexis Carrel in "Man the Unknown".)

Now go ahead and correlate your would-be super-robot to that! Reeking with generalizations? Yes, but wouldn't you have to adapt the robot to generalizations as well as to particulars, and contradicting particulars at that? Remember, Sir Robot is to be *perfectly* correlated. Remember, too, that the above abstract is only a fraction of the total social pattern.

But it all boils down to this: there is in our Judaic-Christian tradition a set code of morals and ethics. They are, despite the disfavor that has lately fallen upon the word, absolute. This is the code we live by, and by which our actions are judged. You and I live by this code every day, whether we admit it or not, and it is directly implied in what you have chosen to call the Expressed Code. Aberrations from this norm are implied in what you have unfortunately termed the Reality Code. "Unfortunate" because you apparently assume that everything we do in the so-called Reality Code is invariably opposed to what is contained in the Expressed Code. As the feller says: "things may be bad, but they aren't *that* bad!"

Now the gigantic paradox you would

impose upon the robot is this: you would adjust him to the ABERRATIONS! The obvious and logical alternative, then, would be to adjust him to the STANDARD. But he wouldn't end up being a robot; if perfectly integrated, he would end up being a saint.

A lot of people today are trying to rationalize themselves to their aberrations. It won't work. In like manner, your hypothetical robot is destined to become a sputtering mass of short circuits and frustrated feedbacks.

It all goes to prove that a man is not a robot. But have fun, anyway.—Thomas P. McDonnell, 106 Brook Road, Milton 87, Massachusetts.

It is precisely those true and absolute rules of the social code, the ethical code, I'm asking for. Will you list them for us? I am well aware of the confusion and lack of definition in the terms of my editorial; the editorial was specifically intended to call attention to the existence of that confusion, not in the editorial alone unfortunately, but in the world at large.

Dear John:

Ah, ha!

Mr. Jack Thomas—gwan, what's his real name—in his story "Next Door" in the March, 1952 Astounding quotes extensively from the works of

the great L. Springe de Tamp. (In another incarnation, I knew that guy.) He quotes him to the effect that a googolplex is a googol to the googolth power. Correct! At least Kasner and Newman who invented the term defined it as such and they should know.

But then he has de Tamp say that a googolplex is $10^{100^{100}}$, or a picayune figure like $10,^{10,000}$. $10,^{10,000}$ aint nuthin'. The number of possible isomers of the nucleoproteins in a length of chromosome 40 microns—i.e. .04 millimeter— is $10^{60,000}$. De Tamp's googolplex fades into literal insignificance.

Now what a googolplex really is by de Tamp's own definition is a googol to the googolth power or: $(10^{100})^{10^{100}}$ which is a horse of another color. This is a number in which you write down a one. Then you write down a hundred zeroes. Then you write down a second hundred zeroes, then a third hundred, then a fourth hundred and so on until you've written down 10^{100} hundreds. In other words you write down a hundred zeroes for every neutron, proton, et cetera in the universe and then keep right on going until you have enough hundreds of zeroes to account for every nuetron, proton, et cetera in a thousand, billion, billion universes the size of ours.

If each zero were the size of a proton, a googolplex written in full would overflow the cosmos. De Tamp's googolplex, on the other hand, that microscopic quantity, $10^{10,000}$, can be written on about four pages of the size present in A.S.F. using its usual print.

Of course, if we view the entire series of natural numbers from one to infinity, we realize that there are far more numbers greater than a googolplex than there are numbers less than a googolplex. Consider that we can start with one googolplex and count: two googolplexes, three googolplexes and so on up to a googolplex googolplexes and beyond—and still not have reached infinity.

We are, therefore, justified in saying that practically all numbers are larger than a googolplex. By sheer chance we happened to be acquainted with a few of the microscopic quantity of numbers that happen to be less than a googolplex.—Isaac Asimov

But infinity is soooooo much easier to write down!

Dear John:

Your appeal, in re literature which is also science fiction, and with special reference to Kipling, strikes a subject that has always been near my heart. In the first place, you overlook three of the Kipling stories, two of which I put in my own anthology, viz.—"Finest Story in the World," "Mark of the Beast" and "Wireless."

But you want new entries. How about André Maurois' "The Thinking Machine"? And Albert Camus' "The Plague," which is perfectly legitimate

science fiction? Lord Birkenhead's "World in 2030" probably can't be called science fiction, because there isn't enough fiction in it but A. Conan Doyle's "Lost World" and "Maracot Deep" certainly can, and should rank high on any list. And W. L. George wrote what is, to my mind at least, one of the best science fiction stories ever produced: "Children of the Morning"—which is completely neglected. Max Pemberton's old "Iron Pirate" will still stand up with many modern jobs and so will Roy Norton's "Vanishing Fleets"; and W. T. Hornaday, the naturalist, wrote a nice and very amusing piece of science fiction many years ago, called "The Man Who Became a Savage."

While on the subject, may I mention that a count over a period of two years, which represents a total of twenty-four books, shows that Book-of-the-Month-Club choices have fallen on science fiction four times, or one out of six.—Fletcher Pratt

Any more nominations?

Dear John:

One evening, Gina and I found a terrestrial creature that would seem to be more indigenous to some other planet. We found a frog obtrusively hopping along the walk outside our house. Gina is always fond of toads, frogs and lizards and snared him with her handkerchief—an unscientific method but effective. In a customary

manner she conveyed him to our bathtub. Science fiction accepted in our house still left us a bit unprepared when we discovered that Hippocrates' counterpart was replete with an extra foreleg, making him quite an unusual five-legged frog.

The extra leg is located under the right foreleg and is fully developed. He employs this leg indiscriminately with the others and swims with all five. Pocrates—rather obvious name—immediately became a hit with the surrounding populace and stories of him were circulated in most of the local papers along with his picture.

The biggest coincidence to us, and as noted in a few of the newspaper articles, is the fact that I've been partial to teratologic creatures as a science-fiction artist. Now I am convinced that some of the unwordly monsters that I have depicted are not only possible but probable. Naturally we've read of other similar oddities of nature, but to us it seems that such a mutation hopping along our way is coincidental.

The news photographer who took several pictures, later told us that the newspapers wouldn't use one picture, showing the frog suspended by his hind legs with the front three legs projecting out, as being too weird.

That ends my science non-fiction short story except that Pocrates is living in an enclosure in our back yard, with a baby bathtub as his pool. —Edd Cartier.

You mean you use live models for those pictures!?!

Dear Sir:

In your remarks on the Ultimate Weapon you are on the right road, but going in the wrong direction.

Here is the problem: Assume that

you are the last survivor of the last spaceship of your race and are shipwrecked upon an unknown planet at an unknown time in the future. Assume that you are alone, unaided and without friends. Assume that you are a criminal of the worst type and that any citizen of the Inter-Galactic Government will kill you on sight. Assume that the idiots among your enemies have an IQ ten times as high as your own and that all the citizens are sinless and unbribable beyond all temptation. Assume that they are telepaths so that you can neither hide from them or trick them.

Assuming all this, how do you destroy their empire?

You are familiar with the ordinary statistical graph and the normal or amateur method of prophecy which consists of carrying the line forward from the last point on in the direction it is moving and then trying to guess where or when it will change direction.

There is a better way. Consider your graph a problem in analytic geometry. Find the empirical equation that most closely follows the course of the past curves of the line and project that line into the future.

By this means it is possible to calculate the limits of the resources of any government. Any man who can calculate the limits of a nation's resources can destroy that nation single handed.

Since every person who learns this method is potentially capable of de-

stroying all law and all government the central government must have doubts as to the loyalty of such persons. But in order to keep track of them the law enforcement officers must learn the method; thus becoming in their turn potential traitors subject to suspicion.

Naturally, each person who knows the method will try to reduce his own risk of death and prison by teaching the method to as many persons as possible.

Thus, as long as the concepts of law, government, unity or universality are in any one man's mind no man anywhere can be safe in his life or property until all other men everywhere are dead.—Wilmer McCavit, 5926 Lorain Avenue, Cleveland 2, Ohio.

The major resource of any government is its people—it's human resource. Now any human that can compute the limit of a human being—he wouldn't have to overthrow a government. He'd be running it already.

Dear Mr. Campbell:

I am writing "A History of Science Fiction" in collaboration with a well-known pro-editor, and for that reason would like to complete my collection of reference material, especially in the line of rarities.

For one thing, I would like to buy copies of all fan magazines ever published. This isn't really an impossible task since I do have—or rather I should say, we have—a tremendous background of "fanzines" numbering several thousand, beginning with the very earliest in 1930.

I would also like information on several elusive stories, supposed to have been published about thirty years ago. I say, "supposed to have been" because I've never read any specific information as to their whereabouts. Two of these particular titles are "The Betelgeuse Express" and "Within the Earth-Atom," the latter a four-part serial.

Among the rarities needed for our sets are certain copies of the *Black Cat* Magazine, first year *Weird Tales*, large-size issues of the *Thrill Book*—or any other issues in fact, since they could be used for trading purposes—the January, 1930 issue of *Astounding Stories*, and the two issues of *Miracle, Science and Fantasy Stories*.

We're only interested in mint copies of *Astounding*, and *Miracle Stories*, however, having in mind a possible reproduction of their covers.

You would be doing us a great service by featuring this letter in Brass Tacks, or in P. Schuyler Miller's Reference Library.—Larry B. Farsace, 187 North Union Street, Rochester 5, New York.

Maybe they would like something easier to find—say geological samples from Tycho Crater, or rose quartz from the Martian hills.

Continued from page 7

and therefore rational—but is very often illogical. Which brings up another interesting point.

One of the standard techniques of logical argument is *reductio ad absurdum*, whereby taking a given set of postulates, and arguing according to strict rules of logic, it is proven that the postulates cannot be true. However, in such an argument—or in any such logical argument—*all* the possible sources of false-postulate error must be examined. But how often is the basic postulate of all examined — the hidden postulate "Logical methods are applicable to this situation." How many times does a *reductio ad absurdum* argument actually prove that the application of logic is itself the erroneous postulate?

Actually trying to apply logical reasoning to even the simplest human relationships shows some rather marked indications of inapplicability, as a matter of fact. If logic were in fact a linear process, and human relationships a nonlinear process, then the characteristic results to be expected would be that logic would work reasonably satisfactorily over very short ranges, but depart tangentially when longer-range differences were considered. Then we would expect that between two nearly identical human beings, logic would work very well, just as plane geometry works well in mapping a city and its suburbs. But between two human beings widely separated in development, if the human process is in fact nonlinear, we would expect a result as inaccurate as plane-geometry mapping of a hemisphere of the Earth.

Try applying logic to the Golden Rule, which is itself a logical postulate: "Do to others as you wish them to do to you." Then, to be strictly

logical, if my seven-year-old daughter does something deserving reward, I should give her a copy of "The Handbook of Chemistry and Physics"—something that I would like. And if I do something she likes, she should reward me with bubble gum and a coloring book.

You'll notice that small children, who are excessively logical, are quite apt to select presents pleasing to *them* to give to parents.

On the other hand, one of my adult, engineering friends could well follow the Golden Rule on a straight logical basis and not miss by much. A friend once gave me a used X ray target from a 250,000 volt machine—correctly and logically predicting that, since he found it interesting and intriguing, I would also.

Now if human relationships are inherently nonlinear, then we could predict a curious sort of phenomenon if we sought to apply linear rules to human groups. Starting at time-point A, we could erect a system of logical laws and cultural rules which would be essentially a tangent plane to the human system topology. In the immediate time-area of tangency, the system should work satisfactorily, but as time went by, the nonlinear human field would show increasing angle and amount of departure. An increasing strain between the tangent plane of logic and the human field would develop, leading presently to the human citizens of the culture paying lip-service to the rules and laws, but not obeying them in fact. Presently the departure would be so great as to induce the law-enforcers to seek to compel agreement between the tangent plane and the human field.

After the explosion was over, a new tangent plane could be erected that would, again, be fairly congruent in the immediate area of tangency.

This cycle could be repeated indefinitely, with the prediction that the more rigorously logical a civilization was, the shorter the period before explosion. On the other hand, the less linear the nature of the cultural pattern, the less rigid it was, the longer it could remain relatively intact.

On this basis, a rigidly logical dictatorship should show the shortest life span, and the highest percentage of difference between the plane of government and the feelings of the people, thus yielding the highest quotient of misery and the maximum violence of explosion.

The late, and thoroughly unlamented Volstead Act, for example, represented a tangent line to the human field. It definitely didn't work—though anyone will admit that it was perfectly logical.

THE EDITOR.

"USE MARCHING FIRE—and *follow me!*" Shouting this command, Lieutenant Carl Dodd struck out in advance of his platoon to lead the assault on Hill 256, near Subuk, Korea. During the fierce in-fighting that followed, he constantly inspired his men by his personal disregard of death. Once, alone, he wiped out a machine gun nest; another time, a mortar. After two furious days, Dodd's outnumbered, but spirited, force had won the vital hill.

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