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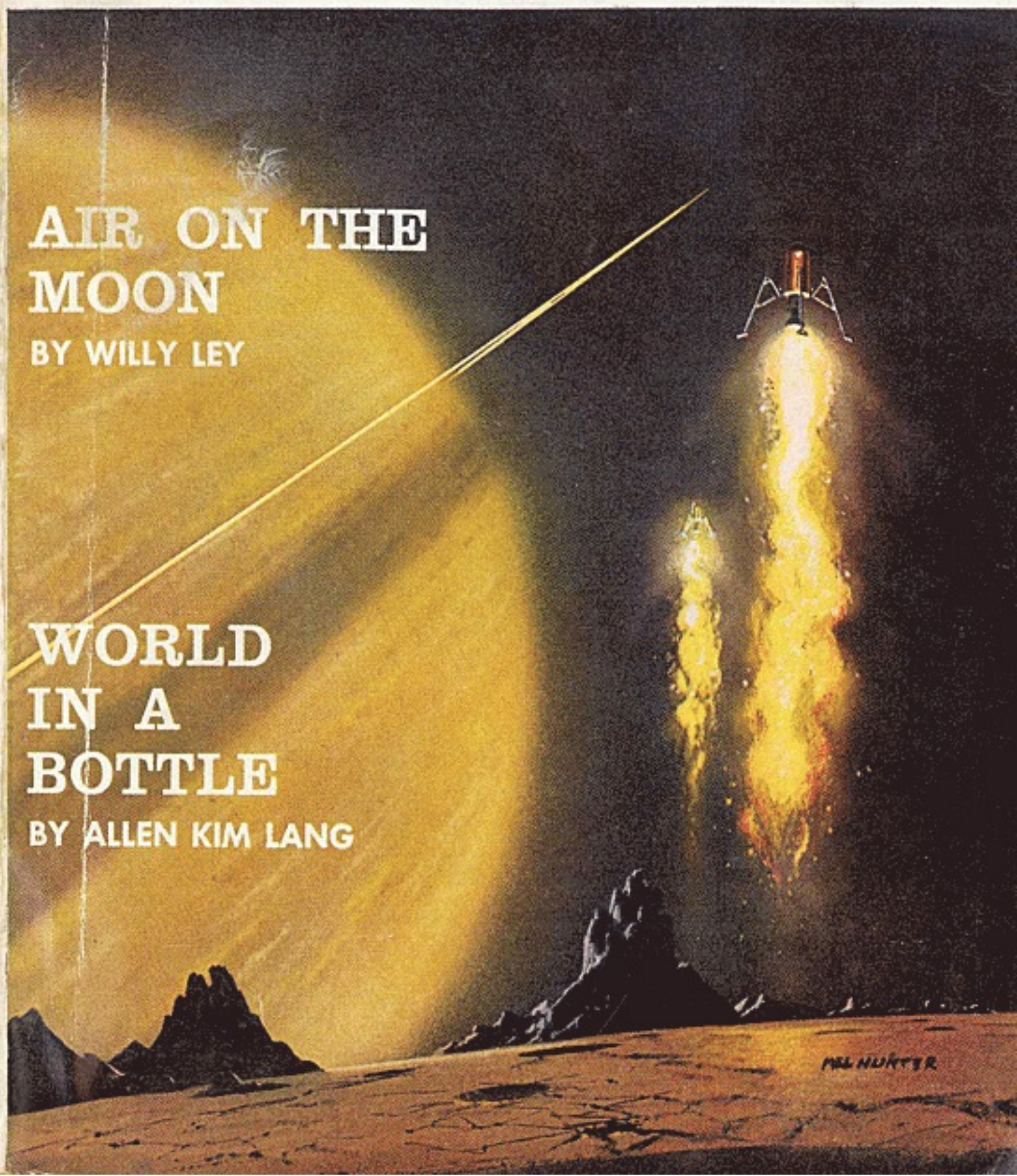
OCTOBER 1960

## AIR ON THE MOON

BY WILLY LEY

## WORLD IN A BOTTLE

BY ALLEN KIM LANG



PHIL HUNTER



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# Galaxy

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# NOTES

**J**UNE editorial called on authors to offer interesting aliens, not just tentacled ones. Offered examples like rackabore—animal with two short side legs adapted to hillside living, but too specialized because left- and right-legged can't turn in opposite direction. Amplifies Robert A. Heinlein: "In southern Missouri where I was born we have two local varieties, the Hillside Snee and the Sidehill Murk, which have solved the problem of how to turn around. They have very large mouths—when closely pursued, they open same quickly, jump through, turning themselves inside out, and thus can reverse direction. This works just fine with the Snee, which is smooth-skinned. Unfortunately the Murk is fuzzy curly; once the fuzz is inside, it tickles poor beastie and he has a tendency to laugh himself to death, unless he again reverses quickly. The Murk is thus rapidly becoming extinct."

Raise a collection? They're fun. Like Fund for Widow of Unknown Soldier—went over the top till spoil sported. And recent classified ad saying, "This is your last chance to send \$1 to" and named nothing but a box number; people did send their buck.

J. F. Bone in town not long ago. Veterinarian prof at U. of Oregon, thinks of self as short, tubby, absent-minded — could snatch horns off charging water buffalo, forgets nothing—*not a thing*. Got onto subject of aliens and animals; what else with a vet? Mentioned above and alligators in N. Y. C. sewage system. Got same damned skeptical laugh as when showing an egg can't be crushed between hands if held lengthwise—no one has ever done it and principle is being worked into new building materials.

Explanation of alligators in N. Y. C. sewage system: baby alligators cute and tiny, but the things *grow*, get flushed away. Doc Bone thoughtful, realized food plentiful, temperature great—blend of hot and cold water, no winter wind; they should prosper. They do.

Bone solved lion-versus-tiger controversy in return for fascinating info on alligators. One lion, one tiger, dead lion—tiger bigger, heavier, smarter. Six lions, six tigers, six dead tigers, most or all lions alive—tigers hunt singly; lions gang up, would take each tiger in turn.

Doc Bone went on to claim membership in club of vets who



have spayed male cats—once. Horrible feeling, he says, fishing around in welter of sweat. Fast look; owner said spay but didn't know sex of cat. Stitch, alter, charge double for ghastly moment, check carefully ever after.

I looked closely; memory of the ghastly moment still had him sweating. Evidently not an experience one gets over readily.

Neither is extrapolating sewage systems after accumulation of high-interest data and then finding it all go down the drain. Reason later. Data:

Detergents, first breakthrough in cleansing agents since discovery of soap, reported on here some while ago as coming out of mains in mile-long, house-high, unbustable bubbles. Hose crews needed on 24-hour duty till bubble problem solved.

Fine, steady uptrend in sewage engineering that would let a fellow take a sound flying guess into the future. Now? Pow! How? In a minute.

Ancient cities limited in size by sanitation facilities. Rome's Cloaca Maxima caused first population explosion. Sewer chases popular in books, films, TV shows. Skip all that to short while ago. Sterilized sludge first-rate topsoil—for Park Department. Methane gas by-product hot competitor against natural or illuminating

gas—but rigid restrictions on sale.

Put sewage in private hands, I'd have said. There's a fortune in it.

But not now. Radioactive wastes? Nope, they're barred. The wonder drugs—antibiotics, tranquilizers, steroids and so forth—it'd take a miracle of extrapolation to figure effects on topsoil manufacture, deep-sea farming and other such marvels that free enterprise might have plumbed.

Will situation settle down? Doubtful—all breakthroughs like ones in drugs create more breakthroughs. Still, there might be some in sanitation engineering; busting the detergent bubble was one. (Wonder how they did it, but no use querying them now. Them? Oh, forgot to mention Dept. of Sanitation has a publicity section. Private ownership, though, and there'd have been a seat on the Exchange, advertising campaigns, maybe a TV show called, say, "The Man from Flushing.")

Home again in Oregon, Dr. Bone wrote that his daughter, 16, thinks he's unplugged and I'm UHF. My son, 18, thinks other way round. Wrote back that this damage to parental self-esteem is inexcusable in modern civilization, suggested organized Teen Exchange, to begin the minute teenagers know everything except why their parents are so cubic, to



end the minute they outgrow it, with enough visits in between to see that this is the best possible arrangement.

Maybe it is at that.

What did I have in mind here?

—"Everytime someone says, 'I don't believe in theories,' a theory dies. Do you believe in theories?"

—"The cat comes on little fog feet."

Every writer has things like that in his idea file, like lady author who woke in great excitement, scribbled, went back to sleep—the cosmic discovery was safe—and read in the morning: "Hoggimus, higgimus, men are polygamous; higgimus, hoggimus, women monogamous."

Note on the koala story. Oh, yes! Man with very tired voice phoned one evening; he worked for Railway Express and had a koala for me and what was the best way to my address? I said, "A *what?*" and he wearily read off name and address of consignor, a woman in Australia, my name and address and amount of insurance—\$10,000. I poked for a break in the story, but there was none; all heavily insured items were accompanied, he had done it for 15 years, and he'd deliver in the morning. I asked why would anybody send me something insurable at \$10,000 and how was I to feed the pickiest

eater on Earth? He said his job was to make the delivery, not do detective work, and he had a supply of food for the koala for a few days.

I called Willy Ley, who agreed that eucalyptus leaves were a problem, but koalas couldn't legally be shipped out of Australia and was I sure this wasn't from Mexico, where they were being bred? The insurance? Entirely possible—getting a koala safely  $\frac{1}{2}$  around the world is quite a trick. Asked to be kept informed. I said sure.

Man phoned, had checked into hotel, shaved, eaten. Very tired. Would I take delivery that night so he could get home to family in Calif.? I said sure. Would I pay for taxi so he could make certain train? I said sure, kept Ley informed.

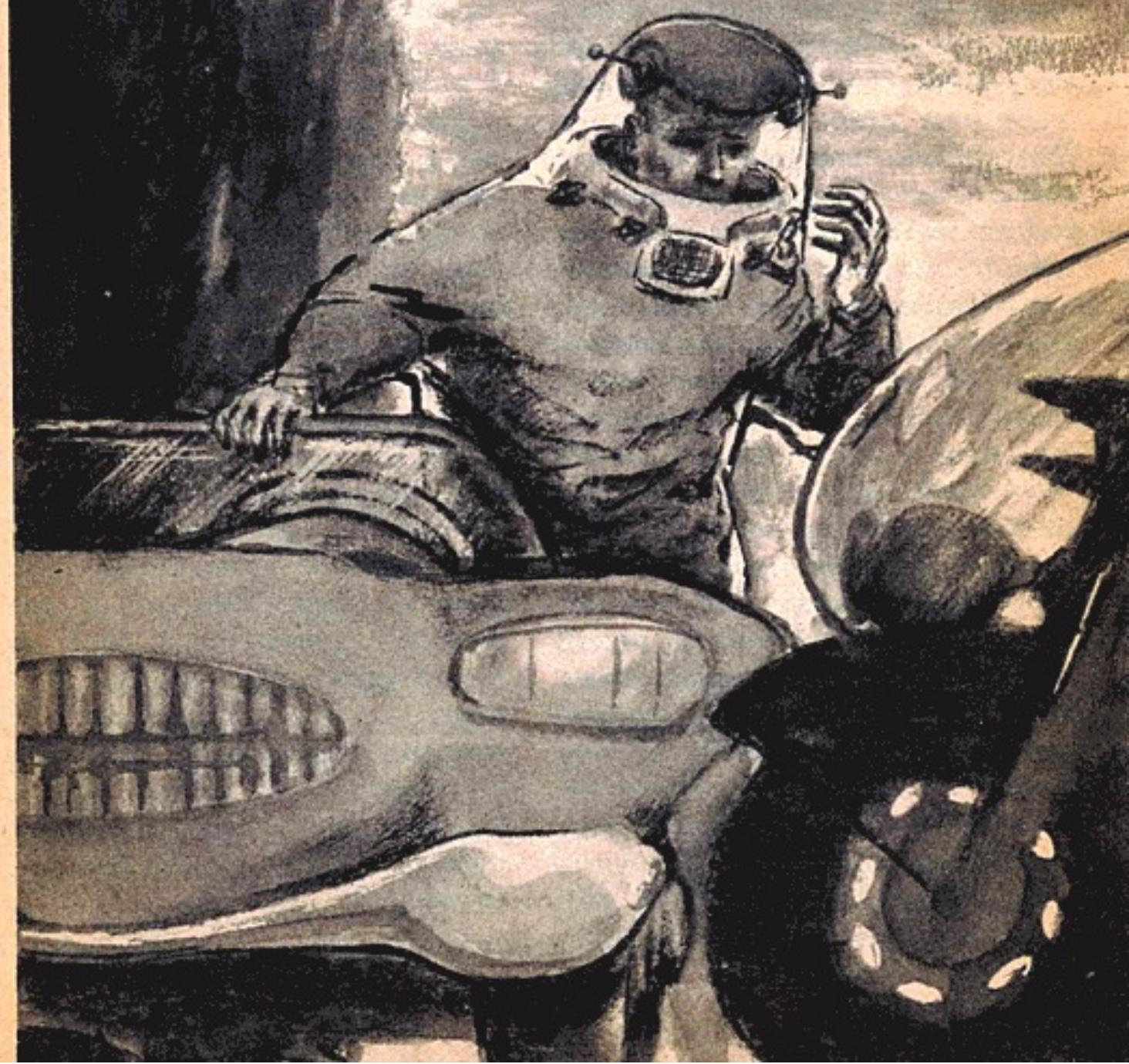
Phone again. Right downstairs, big battle with taxi driver—koala had messed upholstery, would I—I said bring up driver and I'd take care of everything. Called Ley. He said, "Oh, *ho!* A koala wouldn't mess—hard and dry, like a goat's. You won't see the man, but if—" I said sure. No man, no koala, natch, but beautiful detail work, except that last bit, and fine acting. My compliments, and my thanks for a fun evening.

— H. L. GOLD



*Star-crossed? Worse than that! Even Earth  
itself was hopelessly out of reach for these  
landlocked space-travelers who lived in a —*

**world**





By ALLEN KIM LANG

Illustrated by DICK FRANCIS

## in a bottle



I

**P**OURING sweat and breathing shallow, I burned east on U.S. Twenty at ninety miles an hour, wishing I could suck into my lungs some of the wind that howled across the windshield.

I heard the siren in my phones. I glanced out the left side of my helmet to find a blue-clad figure on motorcycle looming up beside me, waving me toward the shoulder. A law-abider to the last gasp of asphyxia, I braked my little green beast over to the berm. The state cop angled his bike across my left headlamp and stalked back to where I sat, tugging a fat book of traffic-tickets out of his hip pocket.

"Unscrew that space-helmet, Sonny," he said. "You've just been grounded."

"Grounded, I'll grant," I said, my voice wheezing from the speaker on the chest of my suit; "but I can't take off the fishbowl, officer."

"Then maybe you'd better climb out of your flying saucer," the policeman suggested. "And if you're toting pearl-handled ray-guns, just leave 'em hang."

I got out of the car, keeping my hands in view, feeling like the fugitive from space-opera this cop evidently took me for. He examined me the way a zoologist might examine the first live specimen of a new species of carnivore; very in-



terested, very cautious. After observing the cut of my wash-and-wear plastic sterility-suit — known to us who wear them as a chastity-suit — the policeman walked around me to examine my reserve-air tank, which is cunningly curved and cushioned against my spine so that I can lean back without courting lordosis. He inspected the bubble of plastic that fit over my head like the belljar over a museum specimen, and stared at the little valve on the left shoulder of my suit, where used air was wheezing out asthmatically. "I guess fallout has got you bugged," he said.

"Not fallout, bacteria," I explained. "I'm one of the Lapins from Central University."

"That's nice," the policeman said. "And I'm one of the Bjornsons, from Indiana State Police Post 1-A. What were you trying to do just now, break Mach One on wheels? Or do you maybe come from one of these foreign planets that don't know the American rules of the road?"

I breathed deep, trying to find myself some oxygen. "I was born right here in Indiana," I said. "The reason I'm wearing this suit and helmet is that I'm bacteriologically sterile."

"So maybe you could adopt a kid," Officer Bjornson suggested.

"Sterile like germ-free," I said. "Gnotobiotic. I grew up in the Big Tank at Central University."

"YOU'LL spend the night in the big tank at South Bend if you're snowing me, Sonny," he said. "Let's see your driver's license." I got my billfold out of the glove-compartment — a chastity-suit doesn't have any pockets — and handed my license to Bjornson. "John Bogardus, M.D.," he read. "You're a doctor, eh? This says you live at BICUSPID, Central University, South Bend. What's that BICUSPID, Doc? Means your practice is limited to certain teeth?"

"I'm a resident in pathology, and I'm damned near out of air," I said, annoyed at the prospect of suffocating while acting straight-man to a state cop. "BICUSPID is the acronym for Bacteriological Institute, Central University Special Projects in Infectious Disease. I'm a Lapin, which is a human guinea-pig. I'm sorry, officer, that I broke the Indiana speed-limit but my air-filter is clogged with condensation. If I don't get back to the Big Tank at the University within the next few minutes, I'll run out of air. And you'll have to spend the rest of the evening testifying before St. Joseph's County Coroner."

"So what happens if you crack open your space-helmet and breathe the air us peons use?" he asked.

"Pretty quick, I'd die," I said. "I've got no antibodies, no physiological mechanism to combat in-



spired or ingested bacteria."

"That's the sort of answer that makes my job the joy it is," Bjornson said. "Next thing you know, I'll be chasing drunken drivers from Mars."

"There's no intelligent native life on Mars," I said.

"You think maybe there are intelligent natives on U.S. Twenty?" he asked, returning my license. "Okay, Doctor Bogardus, I've bought your story. You leadfoot your bomb along after me, and we'll hit the Central campus like we're crossing the payoff line at the Mille Miglia." Bjornson cowboyed into the saddle of his bike, spurred it off and cut siren-screaming down the concrete toward South Bend and Central U. I jumped back into my sports-car and tailed him, the wind soaring past my 'phones like rocket exhaust. We cut through the field of Sunday drivers in a horizontal power-dive. I was half-blinded by the sweat condensed on my air-cooled faceplate. Formaldehyde bath or no, I'd have to cut in my reserve-air pretty soon.

**W**E made it while I was still breathing. I braked in front of the BICUSPID entrance and walked as fast as I dared, dizzy and panting with the concentration of CO<sub>2</sub> bottled up with me in my chastity-suit. Outside the door to the contaminated labs, I shook

Bjornson's hand and told him that I considered the expense of my Gross Income Tax justified by his employment. I went inside then, climbed the steel steps to the glass-walled shower. I cut in my suit-radio and announced my arrival. "Bogardus here. I'm nearly out of wind; my filter's soaked. I'm cutting in reserve-air. Anybody around to see that I scrub behind my ears?"

Dr. Roy McQueen, Director of BICUSPID, came out of his office, where he'd monitored my announcement from the loudspeaker set above his desk, and faced the glass door of the shower room. He waved to me and cut on his microphone. "Okay, Johnny," he said.

I sealed off my air-filter and cut in the reserve-air. That canned wind felt to my lungs like cold beer to the throat on a July day. I felt the oxygen percolating through me to my toes and fingertips, tingling them back to life. Turning on the detergent shower, I sloshed around beneath it, washing the outside dust off my chastity-suit.

"You're dry by the tank," Dr. McQueen said into his hand microphone.

I picked up the long-handled shower brush and scrubbed back there. I showered the suit's arm-pits, the folds behind the knees, the soles of the suit's boots, scrubbing hard with the brush. "You're all wet, Johnny," the Chief said.



"Got enough air for half an hour in the bathtub?"

"Yes, sir," I said, checking the gage of my reserve-air tank. Having scrubbed off most of the flora I'd picked up in the great wild world of Indiana, I climbed down through the manhole into the bathtub, a sump of formaldehyde solution eight feet deep. I sat on the iron bench at the bottom to soak. "How about switching on some music, Chief? I didn't think to bring anything waterproof to read."

"You'll hear music from me," Dr. McQueen said. "This is a big day for BICUSPID, Johnny. It's the first time one of you kids ever came home from a date with a police escort. What happened? Anne's old man decide he didn't want a plastic-wrapped son-in-law? He call the law to throw you off his front porch?"

"My air-filter got bolixed," I explained into the microphone, "so I leaned on the gas pedal pretty heavy on the way home. A friendly gendarme named Bjornson turned up."

"You should be more careful, Johnny. I'd hate to have to post you." Like the rest of us, Dr. McQueen did post-mortems on the germ-free animals who died of old age or stir-fever in the Big Tank, or had to be sacrificed as routine sterility controls. Last winter, for the first time, the Chief had had to autopsy one of us Lapins.

Poor Mike Bohrman had gone off his rocker and stripped off his sterility-suit in the snow. All we wear underneath is a pair of shorts. That's the way Mike had run around, almost naked in a northern Indiana February. It was hours before he'd been missed.

He went to the hospital with severe frostbite, but he died two days later of pneumonia complicated by streptococcal septicemia. "Stick around down there, Johnny," the Chief said. "I'm coming down to join you."

**I** HEARD him turning the monitor microphone over to one of the technicians out in the contaminated labs. Oh hell, I thought. Here comes a chewing-out that would leave me raw up to the duodenum.

The worst thing about being told off when you've done something dumb is the futility of being told about it. Nobody knew better than I that it was stupid to stay outside the Big Tank for eight solid hours. Hydraulic pressure aside, a chastity-suit isn't designed to hold a man more than about four.

It took Dr. McQueen a quarter hour to get suited up and scrubbed. Then he came down the ladder to join me in the pale green soup, his airhose snaking along behind him like strayed umbilical cord. He sat on the bench beside me. Before he cut in his suit radio, he leaned close and touched his helmet to mine.



"Damn it, Johnny! If you don't stop chasing after that dame in Valpo, I'll toss mothballs in the gas-tank of your silly little car." Then he toggled his radio. "Testing," he said, for the benefit of the monitoring technician listening out in the contaminated labs. "This is McQueen. Someone suited up?"

"Safety man is suited and scrubbing, Chief," the monitor said. "I read you loud and clear. Now, let's hear from you, Brother Bogardus."

"This is John Bogardus, the Voice of Purity," I said, "broadcasting from the bottom of Central University's lovely BICUSPID pool. You want I should dedicate my next record to the gang at the brewery?"

"Happy to hear you testify, canned-goods," the technician said. "The I.U. game is on the radio now. You want me to pipe it to the phones so you can hear our team smear 'em?"

"I'll take your word for it that they'll do that," I said. "My sport is balk-line billiards." Eighty years ago, Central University's gate receipts from football had made possible the first BICUSPID program in gnotobiotics, using mice and roaches and hamsters. Despite this historical tie between me and football, I felt no special affinity for the game.

"Trouble with you, canned-goods, is you've got no school spirit," the monitor complained.

"If you or the Chief feel your feet getting wet, just whistle. I'll be here."

"Will do." For all the thousands of times I'd been through this anti-septic drill, I was happy to know that a lifeguard was suited up above our poisonous bathtub, ready to fish either of us out should our suits spring a leak. If formaldehyde-methanol started seeping into my chastity-suit, I knew I'd have an overwhelming desire to undress.

Dr. McQueen cleared his throat, a sound which broadcast very like a growl. "Okay, Johnny. Let's have a synopsis of your Sunday outing."

"IT'S springtime, Chief," I said. "You know what the month of May does to a young man's fancy, and reticuloendothelial system, and all."

"I wish you'd stop seeing her," the Chief said. "You've got fifteen of the most nubile girls in the Midwest living in the Big Tank with you. Sweet, intelligent — available. So why did you have to get the hots for an outsider?"

"It's that ol' debbil incest-taboo, Chief," I said. "I've slept amongst those fifteen canned peaches for the last twenty-three years. The result is that my warmest feeling toward any of them is brotherly love. Who itches to shack with a sibling?"

"Your only alternative seems to be a lifetime of cold showers," McQueen said. "Speaking of



canned peaches, have you seen Mary deWitte today?"

"No."

"Mary has extramural interests, too," he said. "Her intended is a basketball player in pre-Law. A fellow roughly fifteen feet tall. Mary has been gone all day. I presume that she's been visiting this legal obelisk; and I'm beginning to feel the twinges of fatherly anxiety. But tell me about Anne, Johnny."

"I met her at a concert last fall," I said, not giving a damn about the safety man and the monitor kibitzing. "Anne didn't bug at my chastity-suit the way most of the hens on campus do. This impressed me. She liked the way I talked, even though she could hear my voice only from the speaker on the chest of my suit. I liked fine the way she listened. So we had a date. Lots of dates. Said goodnight by shaking hands — Please Excuse My Glove."

"One evening we drove down to the beach at Hudson Lake. As we lay there on the sand, I pointed out for Anne the red disk of Mars. I told her about the men up there, at New Caanan and Bing City and Bitterwater, working to uncover one world while they built a new one. I told her about the mystery of the Immermann skull, and what it might mean. I pointed to the stars and named them for her. All the time, Chief, I knew that I could touch Betelgeuse or Phobos as easily as I could touch Anne."

"Anyway, we went swimming together, just like we were in Technicolor and VistaVision. I screwed the cap on my air-filter and breathed from the reserve tank. Anne wore a bikini. I might as well have been aboard a midget submarine. After that evening, we decided not to go swimming any more; and Anne started wearing strict and conservative clothes."

"What happened today, Johnny?" McQueen asked me.

"What could happen?" I demanded. "We broke up. She's contaminated, poor girl. She's been aswarm with bacteria and yeasts and molds and miscellaneous protista ever since the obstetrician slapped her on the rump, while I'm Boy Galahad, fifty-six one-hundredths percent purer than Ivory Soap. My strength is as the strength of ten, so I told Anne at noon today that she'll have to find herself a new boy friend. She needs a guy who can eat the other half of the pizza with her, someone who can lend her his comb and breathe the air she breathes. It took me weeks to steel my soul to the prospect of kissing Anne off — there's an ironic metaphor for you, Chief — but I did it."

"I'm sorry, Johnny," McQueen said.

"I'm afraid I've diluted the anti-septic with my tears," I said. "Just singing those old formaldehyde blues."



I'd soaked for the regulation half-hour now, and the gage of my reserve tank was on red, so I got up to go. "I can see myself at ninety-five," I said. "I'll be patriarch of the Big Tank. The oldest male virgin on campus. See you inside, Chief."

I climbed up the ladder through the second manhole over the formaldehyde sump and stepped out into the sterile precincts of the Big Tank. Home.

**I** STEPPED into a shower-booth, let the water blast the formaldehyde off my chastity-suit, popped off my helmet and stripped. Air against sweat-steamed skin felt good. I showered again, naked. I blotted myself dry and dressed in fresh shorts, all the clothing a man needed in the air-conditioned Elysium of the Big Tank. I carried my suit into the locker room to refit it for my next trip outside. Snapping its collar to the bushing of the compressed-air supply and turning on the pressure, I inflated my suit so that it stood on its headless shoulders, ready for inspection.

The wet air-filter that had almost asphyxiated me had been caused, I discovered, by a break in the moisture-trap of the unit. Careful checking assured me that the filter had failed-safe bacteriologically. No outside bugs were in my suit. I might have suffocated, but my corpse would have remained uncorrupted. Such a comfort.

I replaced the trap and filter with a fresh unit and fit a charged bottle of air onto the back of the suit. Then I gave every inch of my chastity-suit an inspection for worn spots, for bubbles forming on its moist surface — an inspection as painstaking and as sure as a window washer's check of his working harness, or an exhibition jumper's folding of his parachute. Satisfied that the suit was all set for my next adventure into the world of normal, septic human beings, I racked it and the helmet in my locker and walked out into the garden.

There I stretched out on the grass under the ultra-violets, refreshing my tan while I waited for Dr. McQueen to come up from the sump.

The garden was my favorite room in the Big Tank. It was in establishing the garden that I'd discovered that my Machiavellian mind is articulated to a pair of green thumbs. The crafty bit came over coffee in the cafeteria. I, of course, just sat there to listen and talk; not even C.U. Cafeteria coffee is aseptic enough for a Lapin to drink, even if there were some way to get a cup of the stuff inside the helmet of a sterility-suit. Anyway, I chided these two graduate students from the botany department about the research possibilities they were missing by not growing any gnotobiotic green stuff. I gave them the Boom-Food pitch. Would



cabbages, grown in an environment free of bacteria, grow large as king farouks? I hit them with the Advance the Frontiers of the Biological Science line: could soil-nitrates be utilized by legumes in the absolute absence of *Nitrobacteriaceae*?

**T**HE two botanists leaped to my vegetable bait like a brace of starving aphids. A couple days after I'd commenced my con, three tons of quartz sand were shipped through the Big Tank's main autoclave. The lifeless stuff was poured over a grill of perforated pipes. The pipes were connected to a brew-tank of hydroponic juices, and the wet sand was planted with germ-free seeds of grass, tomatoes, carrots, and other useful herbs. We Lapins had a ball, planting the aseptic seeds in the dirtless dirt eagerly as a band of ribbon-hungry 4-H'ers. What had been our sun-room blossomed, after a decent period of germination, into our lawn and garden.

For some reason, the garden of our Eden never got an apple-tree. But we did have lettuce on our sterile sandwiches now, and fresh tomatoes, infinitely superior in texture and taste to the "radared" fruit — almost pureed by the high-energy beams that made it germ-free — that we'd grown up on.

The lesser mammals with whom we twenty-nine Lapins shared the Big Tank, the rabbits and guinea-

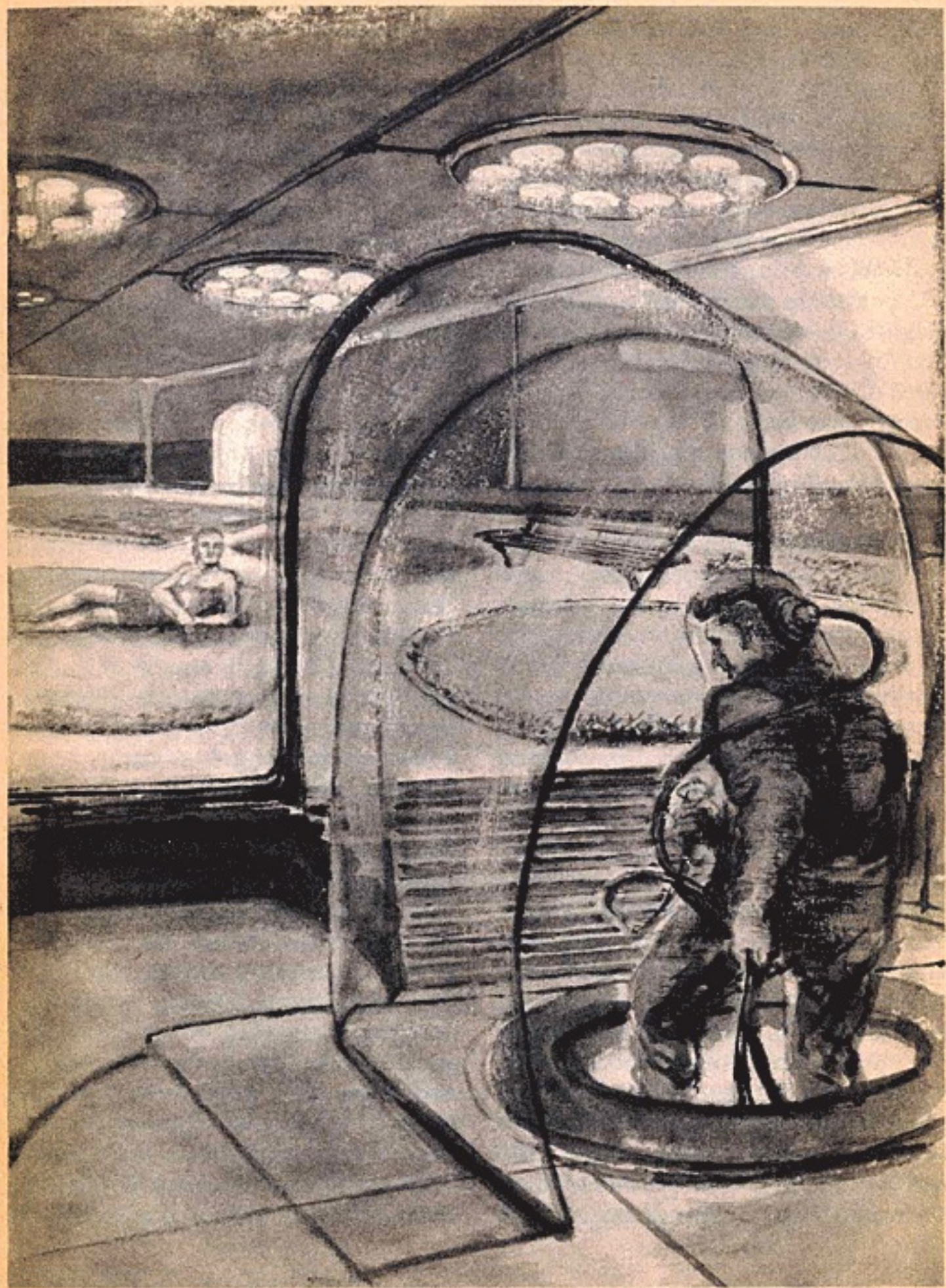
pigs and hamsters and like small fowl, didn't go much for fresh vegetables, having developed a palate for an autoclaved diet. The monkeys, though, proved to be real competitors for carrots and raw sweet corn. They had to be locked out of the garden, rather as certain of their disobedient relatives had been.

I reached out from my supine, sun-drenched position to pull a turnip. I shook off the moist sand and wiped the hydroponic wetness off my shorts, to munch grittily while I waited for the Chief to join me.

As soon as he'd soaked in the formaldehyde mixture for half an hour, Dr. McQueen came up through the manhole. Under the shower he squirted the chemical B.O. off his modified sterility-unit, then came out into the garden to join me, dragging his air-hose. We sat side by side on the park bench I'd built beside the onion-patch. (I was fond of my onions. They were the only living things in the Big Tank with the honest stink of life to them). "Where did you plant the marijuana, Johnny?" the Chief asked me. His voice was muffled by the wetness of his suit-speaker.

"Now, there's a pregnant idea," I said. "We won't plant muggles, Chief. We'll plant tobacco. All we Lapins need to keep us happy is a good solid vice like smoking." I looked at the Chief. "Why'd you







follow me here, Dr. McQueen? I know I've been naughty."

"Self-pity doesn't become a man, Johnny," he said.

"And why the hell not?" I demanded, my blood-pressure ready to challenge any manometer in sight. "If I can feel compassion for some poor joker on TV, why can't I hurt a little for myself — for John Bogardus, swaddled from his darling by a damned plastic diving-suit? I was — I am — in love with Anne, Doctor."

"Your marriage-night would kill you, John," he said.

**I** JUMPED up with ready-made fists, then flopped down onto the grass, laughing at the picture I saw. Battle of the Century. In this corner, wearing helmet, chastity-suit, and thirty-five feet of air-hose, Roy McQueen, Ph. D. In the far corner, clad only in brown trunks (grass-stained on the seat, folks), John Bogardus, M.D. "It makes a grand old dirty joke, doesn't it?"

"It makes a painful reality," Dr. McQueen said. "I know how you must lie awake nights, thinking about gradually acclimatizing yourself to the contaminated world in which Anne lives. You know, though, that the death-rate with the lower animals who've tried this acclimatization is steep. Even the survivors don't survive very long, because of their low gut-tone and

their tardy antibody response. I suppose, though, that the imminence of death is as helpless before love as the locksmith." Dr. McQueen sighed. "If it's what you want, Johnny, I'll ignore everything we both know about the probable consequences and help you break out of here . . . Think how embarrassed you'd feel, though, if you died of a *B. subtilis* septicemia or a fulminant chicken-pox the day before the wedding."

"I could have married Anne, and made her either an unknissed bride or an early widow," I said. "Neither of these alternatives struck me as an attractive career for the woman I love, so I left her. It's so logical it's practically simple arithmetic. Anne put up a fight to keep me, Chief; it was most warming to my amour-propre. Women aren't logical like us men of science. What a stinking situation!"

"It is," Dr. McQueen said. "But remember, John, lovers outside the Big Tank often get just as star-crossed as you and Anne."

"And they have dental caries to contend with, which we don't," I said. "Somehow, Chief, we'll get this experiment into its second generation, past the miseries of the gnotobiotic first-born, we Adams and Eves who were delivered into purity by aseptic Caesarian section. Maybe we'll have to toss coins or draw cards to pair up for parenthood. But any kids we raise will be



spared that indignity. Know how I've got it figured, Chief? We've got to make provision for exogamous matings, right? Novelty, in other words, is essential to romance. Here's the way we'll work it. We'll set half the babies, boys and girls together, on one side of a wall, half on the other side. We'll have established two tribes of kids, each growing up in ignorance of the other; and we'll keep them strictly apart till they're in their middle teens. Then, maybe the night of the Junior Prom, we'll cut a doorway in that wall and introduce them to each other."

**D**R. McQueen smiled. "That will be a splendid evening, John. And a situation to make an anthropologist's mouth water. You may have found the answer to one of your children's major problems. I only wish we had as simple a solution to the current troubles of John Bogardus."

"Don't blame yourself for what's happened to me," I said. "I've carried on pretty bad today, but that doesn't mean that I or any of the other Lapins blame you for causing us to be birthed into the Big Tank. It had to be done. Once Dr. Reyniers had made gnotobiotics possible, a colony of germ-free humans became available. You did a good and honest job of bringing us colonists up, Chief. As good a job as anyone could do."

"Thank you, John," he said. "I often wonder, though, whether the Nuremberg Principles really gave us the right to build and populate this germless microcosm. We told your mothers when they volunteered that the results of raising humans gnotobiotically would be important. They have indeed. Thousands of lives have been saved by what we've learned here. We saw to it, as we'd also promised your mothers, that your health hasn't suffered by reason of experiments, that you've been given the education you need to earn a good living, and especially that your dignity as human beings has always been respected. The core question is, did we have the right to involve fellow humans, not yet born, in a process the end of which we couldn't entirely predict? Enough of this, though. My conscience is my own problem. For your immediate relief I can offer only: keep busy."

"Work is dandy, but liquor's quicker," I said. "A wound of the heart calls for a therapeutic drunk."

"I'll honor your prescription, Doctor," the Chief said. "The moment I get outside, I'll Seitz you some of my own Scotch." He stood up and caught hold of his air-hose. "Forgive me for behaving so like Pollyanna, John," he said. "I wish I could offer you relief more potent than Scotch and sympathy."



"Such spiritual Band-aids are all the help there is, Chief. Thank you for them."

He slapped me on the shoulder with his gloved right hand, then walked through the shower-room, trailing his black air-hose, and dropped down the manhole into the formaldehyde sump on his way back out into the world.

I sat on my bench in my artificial garden in the middle of the great steel womb I'd been delivered into, and I thought about my Anne.

"**I**F I had a chisel and about four tons of Carrara marble," the girl standing behind me said, "I'd hack me out a statue on your model, and call it *The Thinker*." Dorothy — the Firebird — Damien plumped her little backside onto the bench beside me and scintillated eagerness to converse.

I didn't want to talk to anyone at the moment, certainly not to the Firebird. To employ a metaphor from an appetite less exalted than love, seeing the Firebird after losing Anne was too much like being offered hamburger after having had a filet mignon snatched from under nose.

Still, as my peripheral vision took in the Firebird's brilliantly distributed five-foot-three, I realized that my metaphor was false. That flame-colored hair and impish, freckled face; that halter taut

as a double-barreled ballista cocked to fire twin rounds; I turned my attention to the girlscape beside me, quite innocent of covetousness, my interest purely aesthetic. No hamburger, this. Firebird Damien was *filet mignon*.

But she wasn't Anne.

Suddenly I was contrite toward my fellow captive. "You're looking splendid, Miss Damien," I said.

"And you got a face peeled off the iodine bottle. Tell mamma where it hurts."

"Don't delve, doll."

"Woman-trouble?" she asked.

"The term is tautological," I said. "*Woman* and *trouble* are synonyms. If the language had any logic the words would rhyme."

The Firebird put a freckled arm across my shoulder and squeezed my deltoid with her resting hand. I shrugged. "Don't try to shake me loose, Johnny," she said. "I'm trying to find out what sort of people you are. Whether you're a Shriner or a Flesh-Presser."

"Obviously, you're of the Shriner persuasion," I said.

"Hoo-hah! Shrinkers are the other race from me," the Firebird said. "They're the people who quail at shaking hands, who never slap a back nor playfully pinch. They hate to be crowded, don't like to be touched. My sort of people, though, tend to cuddle like puppies, or like cattle in a thunderstorm; we take comfort in



the closeness of other humans. We're not erotic about this, Johnny. Not necessarily erotic, I mean. We have our moments, too, or the Shrinkers would long since have taken over the world in spite of their dreadful handicap. We're the people who make brilliant barbers. The kind who say hello to you with a Roman handshake and a clasp on the shoulder. We're the doctors with the healing touch, the most tender nurses. We're the Flesh-Pressers." She gently squeezed my shoulder-muscle again to demonstrate. "Tell me what's the matter, Johnny. Maybe I can help."

"NO magic touch will cure my trouble," I said. "Anne and I are through. It was hopeless. I was like the goldfish in love with the cat. So I called our romance to a halt today and drove home in my little green sports-car, feeling a little green and hardly sporty at all. Please don't mention this again, Firebird; not till I'm old and bald and my wound has healed to a thin white scar."

"Can I say one thing?"

"You will, so do."

"I'm really sorry, Johnny."

"Thank you, Firebird," I said. "The Chief promised to send some therapeutic juices through the Seitz filter. If you've a mind to sample a little sterile White Horse, perhaps tie one on with me this

evening, you'd be most welcome."

"I'll be proud and happy," the Firebird said. She scooted even closer.

I found her propinquity not at all unpleasant. Was I perhaps of the Flesh-Presser clan myself? The girl smelled good, the faint wholesome feminine odor of my Lapin foster-sisters — a perfume an outside wench, host to a universe of bacteria, could approximate only with Pepsodent and the most meticulous attention to her underarms, I gather from TV.

"How am I to entertain you, sir?" the Firebird asked me. "I have current gossip, vintage scandal, clever anecdotes lifted from the steaming pages of my autoclaved *Reader's Digest*, imitations of bird-songs — heavy on the mating-calls, these — and sheer adoration." She paused. "Scratch that last offering, Johnny," she said. "It's unhygienic for a girl to wear her heart on her sleeve, even here."

"I've lost touch with the Big Tank social whirl these last few weeks," I said. "I've been spending all my alive-time in the greater world of Valparaiso, Indiana. Bring me abreast of the local gossip, Firebird, if you please."

"Gladly. First there's the case of Mary deWitte. She's still on the trail of her basketball star — a fellow named Lofting — confident that somehow they'll manage to compromise her hateful purity . . .



Maybe I shouldn't have mentioned Mary," she said, seeing that I was frowning.

"I was just thinking," I said. "Miss deWitte and I might get together to establish an Amour Anonymous group in the Big Tank."

"If you do, Johnny," the Firebird said softly, "write me up a card as a charter member."

"The Chief was talking about Mary deWitte only a few minutes ago," I said. "Hasn't she accepted the fact that we Lapins can't hope to breed with those jungle weeds outdoors?"

"Have you accepted that fact, Johnny?" the Firebird asked.

"Apt question," I admitted. "Sure. I've decided that Anne is as unavailable to me as Mars is. I don't know which makes me more bitter, Firebird; losing Anne or being denied the chance at the stars. Now that the solar system is getting man's footprints all over it, now that the Orion ships are slamming out to Mars and back on a busline's schedule, and the biggest ship of all is being fitted for deep space at the back of the moon, the constellations don't seem much further off than Chicago. But not for me."

"You think you're bitter, bud, you should hear me with my hair down," the Firebird said. "But we've had dirges enough for one evening. Your whiskey should be

filtered through by now. Let's go wet our Scotch apéritif, and have dinner."

"I'm not hungry," I said. "I just ate a turnip."

"Will turnips make you big and strong? You need solider food, like Scotch. That's my professional opinion, Doctor." She got up and tugged at my hand. "Come on, Johnny. I'm not about to let you sit here all evening and brood."

"Is this your prescription, sweet Firebird?" I asked. "That I'm to go back to the madding crowd, mingle with my twenty-eight fellows in aseptic togetherness? Well, you're probably right." I got up from my park-bench to walk with her, hand-in-hand, to the dining room, stopping en route at my room for a shirt. Dinner was a formal affair in the Big Tank, shirts for the gentlemen and shoes for all.

**T**HE other Lapins were already eating. They greeted me and especially the Firebird with jokes and fellowship sounds.

I felt very much at home with them. There was Bud Dorsey, our weight-lifting astrophysicist, his magnificent u.v.-blackened body a study in the surface musculature of the human male. At his table was Karl Fyremeister, who has a practically complete collection of the airmail stamps of the world to console him on long winter evenings. All the stamps are quite sterile.



Karl was talking with Gloria Moss, whose academic specialty was group dynamics. She demonstrated muscular dynamics so attractively that when she walked about the campus in her chastity-suit she drew whistles, a truly remarkable accolade when you consider that the c-suit is somewhat less faithful to the wearer's form than a poncho. Keto Hannamuri sat the four-place table with Bud and Karl and Gloria. He was my fellow-medic among McQueen's Beasts, a pediatrician. Kids loved him. Wearing his sterility-suit as he made his Ped Ward rounds, that Oriental smile showing through the faceplate of his mask, Keto seemed to the television-nurtured youngsters the very model of the friendly extra-solar alien, complete with space-suit. Besides his flair for showmanship, Keto was a remarkably fine doctor. As we passed his table, he slapped the Firebird's short-shortened callipygia in a kinship-gesture of the Flesh-Presser clan.

I felt a sudden overwhelming love for all these people, my brothers-and-sister-in-exile. I took my tray to sit down quick with the Firebird before my reserve, depleted by the emotional beating I'd taken at noon, gave way.

The menu featured radared steak. The meat was germ-free and somewhat tenderized by the high-energy beams. (A purist in

culinary proteins might go so far as to say denatured.) The nearest any Lapin came to ingesting a bacterium was here at the table, where we ate billions of bacterial corpses. The bugs achieved a post-mortem revenge by triggering the production of faint bacterial antibodies in our blood.

Besides the steaks and the myriads of murdered microbes, we had an aseptic salad prepared from Tank-grown hydroponic vegetation, dressed with Roquefort, the cheese that vies with penicillin in my private hall of fame as the noblest product ever a mold gave man. The Scotch that Dr. McQueen had promised to send was on hand, Seitz-filtered into a sterile White Horse bottle. Not really caring to dilute my poignancies with alcohol, I passed the whiskey among the tables nearby.

THE Firebird was managing to stay quite close to me, though technically remaining on her own side of the table, eating and talking and now and then flashing me such a glance of yearning that I was pierced by the sight of her and by a remembered line of e. e. cummings's: "... your slightest look easily will unclothe me though I have closed myself as fingers . . ." Just as suddenly, I realized that mine was a highly pathological state of mind, the rinse-phase of the brain-wash. Autism can be



produced as surely by loneliness or unrequitable love as by injections of LSD-25.

So I turned my attention to my environment, consciously flexing my muscles of mental health. I answered the Firebird's sallies with automatic flippancy. I ate my steak, savoring its flavor. And I looked about the dining-room, examining it as though I'd never eaten there before.

The Lapins' dining-room in the Big Tank is about the size of a railroad restaurant car. (Not that I've ever been aboard a train to make the comparison. The stringencies of the sterility-suit tie such of us to the Big Tank on a short leash: the most sanitary of outside washrooms would prove a pesthole to a Lapin.) The kitchen, which was under the supervision of the Firebird, our dietitian, could have been squeezed into a telephone booth. It served chiefly as receiving-station for the autoclave and the radar-room, through which all our food came. With its ten little four-place tables, each covered with a gypsy red-checkerboard cloth, set with a green glass vase of Tank-grown daisies, our dining-room was friendly enough. The Tank-ness of it, though, was emphasized by a mural along one wall, a fantasy of stars and men and microbes that half a dozen of us had planned and painted one week. Where the mural was now

had once been a picture window, overlooking a green stretch of Central campus, a source of comfort to us all. An Air Force jet, though, pulling out of a dive invisibly above us, had sonic-boomed a crack in both panes of the double glass of the window, causing a general alert as we realized that some airborne *Proteus* or fortunate *Staphylococcus* or lonely *Aspergillus* might have invaded our fortress through this almost microscopic breach in our walls.

Careful decontamination had saved our sterility, but now the Big Tank had no window.

"I was saying . . ." the Firebird said, in a firm voice.

"Sorry, doll. You were saying?"

"That Mary deWitte isn't here. Do you suppose she's still outside? She checked out her sterility-suit about the same time you did."

"That's a good nine hours ago," I said, glancing at the clock set over Saturn on our mural. "Either Mary has been on a restricted-fluids diet, or True Love has made her careless of visceral discomfort."

"Don't be coarse, Johnny."

"The demands of the kidney are as exigent as those of the heart, Firebird," I said. "I think I'd better call Dr. McQueen."

"You'll only cause trouble for her and Lofting," Firebird said.

"I've decided that it's better to be lovesick than dead," I explained, getting up from the table.



**I** WENT to the phone in the corner of the dining-room and dialed Dr. McQueen's home. "Chief? John Bogardus. Mary deWitte still hasn't come home to roost. I think we'd better find her before she does something splendid and foolish."

"Like perhaps marrying her contaminated basketball-player and setting out on a suicidal honeymoon?" Dr. McQueen suggested. "You're right, John; we should prevent that sort of thing. The rub is, we're too late. I got a phone-call from Mary a few minutes after I got home this evening. She abandoned her sterility-suit in a downtown Chicago hotel room at noon today, and married her fledgling lawyer in a civil ceremony at one o'clock. I tried to find out from her where she was, but she just said she was very happy and hung up."

"Hell! What are we going to do?"

"I'm flying to Chicago, where I'll ask the help of the police in finding Mary," the Chief said. "Once I've run down the happy couple, though, damned if I know what I'll do next. Shall I stand outside the bridal chamber with a syringe of broad-spectrum antibiotics, waiting for Mary to sneeze?"

"They'll have a short marriage," I said.

"Mary knows how likely it is that she'll never grow old," Dr. McQueen said. "But I suspect that she hasn't said a word to her husband. I'd better go now, John. My plane leaves in twenty minutes."

"Don't let this prey on you too much, Chief," I said. "We Lapins have free will, too. We're old enough to bear the responsibilities for our own actions."

"Thank you, Johnny." Dr. McQueen hung up.

I returned to the table with no enthusiasm for the remaining half of my steak. "What's up, Johnny?" the Firebird asked me.

"Now we are twenty-eight," I said. "They were married in Chicago at one o'clock."

"How wonderful!" the Firebird exulted.

She stood and pounded our table-top with the vase, scattering damp daisies on the cloth. "Quiet, everybody! I've got an announcement." The chatter over dessert simmered down. "Mary deWitte got married today — here's to the bride!" Firebird slopped two ounces of White Horse into her glass and downed them at a heroic gulp. She sat, sputtering. The chatter at the other tables crescendoed as our colleagues reminded one another of the significance of the Firebird's news.



"Will you also propose the toast at Mary's wake?" I asked.

"**W**HAT a hideous thing to say!"

"It was, Firebird," I said. "Forgive me, please. This thing has left me in a wounding mood."

"Is Mary really in such danger?" Firebird asked.

"She may last a week, not much more. Today she'll meet *Klebsiella*, probably; perhaps *E. coli* and *Shigella*. Pretty soon she'll start to sniffle with the first common cold she's ever experienced. Polio virus and the ECHO group may get to her first, and establish themselves before there is sufficient growth of bacterial flora to give them competition. Her intestinal walls are thin and weak, so she may suffer megacolon as a result of gas-producing fermentation. From a pathologist's point of view, I'll find it most instructive to learn the manner of Mary Lofting's death. From the standpoint of a friend and fellow Lapin, though, I'll think her death a damned shame."

"I'm getting a little drunk, Johnny," the Firebird said, "and a little maudlin. So, say you're right. After all, you're the doctor and I'm just a dumb dietitian. But don't you think maybe it's worth while, what Mary's done? Condemning herself to die, I mean, because she's really in love, and

death is what she's got to pay for a few days' happiness. Don't you think the price is fair, Johnny?"

"If I did, I'd be paying it," I said . . . "No, Firebird. Seizing a little love and poetry before the sacrifice is great stuff for epics, but it doesn't make much sense to me. When I'm married I'll want to see my children all the way through Spock and Gesell. I'll want to grow old with my wife, if you'll excuse the corn."

"We Flesh-Pressers have a natural reverence for corn," the Firebird said. "It's part of the syndrome. Johnny, if you really want what you just said, want those things badly enough to set up a marriage on half a love, give me a call. Anytime. Even though I don't set your blood aflame." She stood up, a little unsteady, and rubbed her hand across her eyes in a tardy effort to hide tears. "Save the brushoff till tomorrow, Johnny," she said. "Goodnight."

"Goodnight, sweet Firebird," I said. She turned and walked quickly from the dining-room.

Bud Dorsey, our weight-lifting astronomer, left his three companions to bring his coffee over and sit with me. Bud was the Lapin who'd have been a Central U. fullback as an undergraduate, if only Dr. McQueen had let him play the game in a chastity-suit. "What will happen to Mary de-Witte, John?" he asked.



"She'll die," I said.

"One flight in the sunlight, then her wings fall off. We Lapins are a fragile race. May I?" I nodded. Dorsey poured some of the Scotch into Firebird's empty water-glass and sipped it.

"THE men who devised the Nuremberg Principles failed us when they forgot to underwrite the romantic aspirations of human guinea-pigs," I said. "As a result of their oversight, it seems that McQueen's Beasts have made a bigger contribution to sociology than to bacteriology. We've demonstrated that familiarity doesn't breed. Here we are, now, fourteen pairs of healthy Americans in their middle twenties, and neither a marriage nor a pregnancy amongst us. Why?"

"Tell me, John," Dorsey said.

"I'll tell you why," I said. "It's because we're fond of our foster-sisters, but we're also a little bored with them. And they with us. We men know every canned peach's flirtations and frailties and conversational gambits so thoroughly that one of us could no more marry one of them than the average outsider could marry his kid sister."

"Even that's been done, John, just for principle's sake," Dorsey said. "The Pharaohs wed their sisters because no one else was

exalted enough for the honor. Our predicament is not dissimilar. The primal urge, John, will in time overwhelm the curse of contiguity."

"Could be," I said. "But it's not just sex that's agonizing me, Bud. Prison has whole constellations of frustration. However warm and understanding our guards may be, this is still a prison, and half of us are stir-crazy. Why did Mike Bohrman take off his chastity-suit last winter, to walk barefoot through the snow with only his suit-shorts on, till he collapsed from the cold? It was a prison-break, Bud. So was Mary de-Witte's witless marriage. They were both suicide, the lifer's one way over the wall."

"Stir-crazy?" Dorsey asked. "You're exaggerating, John."

"Open your eyes, Bud," I said. "Look at Karl Fyrmeister's hands, for example. I'm violating no medical confidence to tell you that Karl got his dermatitis as the result of compulsive hand-washing. There's a fine neurotic symptom for a germ-free Lapin! If I'm exaggerating our collective un-sanity, Bud, tell me why Lucy Cashdollar has become an apprentice alcoholic. Why does Fizz Ewell, with an I.Q. that must range in the 150's and the most brilliant record the Nuclear Engineering Department has ever seen, spend



six hours a day working crossword puzzles? Why do you have that tic of your left orbicularis oculi? Why am I an insomniac, with a nasty barbiturate habit? Look around, Bud. You'll see that our little home has turned into something of a snakepit. Our neuroses are only garter snakes so far; but they'll grow into cobras, given time and further frustration to feed on."

**D**ORSEY'S left eye twitched as though my mentioning his tic had triggered it. He self-consciously raised his fingers to the vellicating muscle, more to hide than to soothe it.

"While our keepers were sending Lapins through every major discipline offered on the campus," he said, "it seems they'd have done well to have trained one of us in psychiatry."

"For what?" I demanded. "So we could have someone right here in the Tank to spoon out our soothing-syrups? Man, we've got a right to be stir-crazy. We're life prisoners and we've committed no crime." I stopped to get my calm back. "Bud," I asked, "do you know what I want more than anything else, next to Anne?"

"Of course I do," Dorsey said. "Like you've pointed out, John, we've got no secrets from each other. Your big itch is to step aboard one of the Orion ships. You

want to join up for the chase after interplanetary white whales."

"It's only natural," I said. "When we were kids, Bud, we saw the same TV programs, the same space-adventure movies, as the kids who are now the men in space. Every boy in America was conditioned to long for a space-suit. I'm one of the ones who could have made it, Bud. I love medicine, and I think I'm going to be a damned fine pathologist; but I'd turn in my M.D. for an Ordinary Spaceman's ticket without a second's hesitation. When I read, two years ago, that Immermann had discovered that human skull in the oxide rubble below Roosevelt Ridge in Syrtis Major, I cried for the first time since I was six years old. Twenty thousand years ago there was man on Mars. And I'm confined to Earth for life."

"How much do you know about the Immermann skull, John?" Dorsey asked me.

"What I've said. Is there more?"

"One point," Dorsey said. "My field, radio astronomy, is a deep-space sort of specialty; but I do from time to time condescend to read the *Journal of Aerology* and the other parochial, solar-system publications. Somewhere I read that there's something odd about that skull Colonel Immermann dug up."

"If you're suggesting that it was a second Piltdown hoax, planted in



that Martian talus to jar larger Air Force appropriations from Congress, keep it from me," I said. "I cherish the illusion that the Immermann is genuine, and a mystery."

"IT isn't phony, and it's sure as hell a mystery," Dorsey said. "Colonel Immermann's initial report of the skull's discovery was verified by every member of the *Orion Gamma's* crew, a gang recruited mostly from Service-Academy grads and other high moral types. The peculiarity I'm talking about isn't forensic. It's functional. If you were to mix in the Immermann skull with an assortment of skulls of modern western men, age forty or thereabouts, only one characteristic would allow you to pick it out from the mixture again. 'Look, Mom—No Cavities!' Like us Lapins, Immermann Man had acarious teeth."

"Because he was germ-free?" I suggested.

"It's possible. Or his medical science may have gotten oral bacteria under control with drugs. Maybe he preserved his teeth by diet, or with fluorides in his drinking-water. Perhaps his mother never let him eat candy when he was a kid," Dorsey said. "Who knows? Good teeth and all, though, our Immermann Man died twenty thousand years ago. Why? Was he germ-free, as you suggest; and was he killed by some species of Mar-

tian micro-organism that's since gone extinct from drought and a shortage of hosts? The big question, to my mind, is why none of our explorers has yet found any sign of the rest of the expedition."

"Expedition?" I asked.

"A man could hardly have been alone on Mars," Dorsey said.

"From where?"

"Pick any 'F'- or 'G'-type star with planets," Dorsey said. "After all, it's easier to posit extrasolar man than to suppose a flint-drive spaceship was devised by some early neolithic von Brauns."

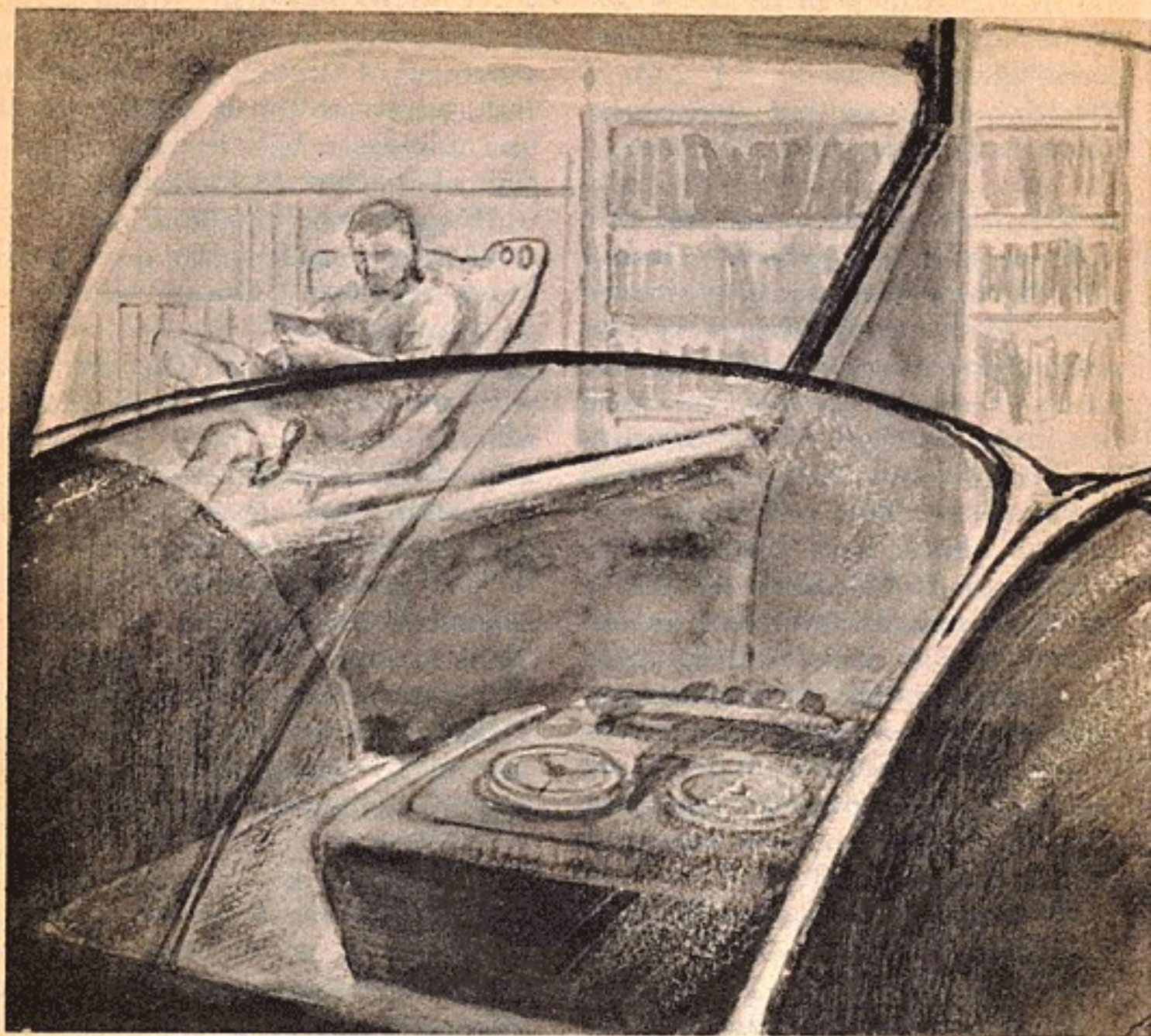
"I'd never expected to see an astrophysicist take off on such a flight of improbabilia," I said.

"John, would you like to hear a thread-recording I just got from the radio observatory at Adelaide?" Dorsey asked.

"Hi-fi?"

"The radio sky is strictly spark-gap quality, no fi at all," Dorsey said, getting up to lead the way from the dining-room. "This transmission you're going to hear doesn't have anything to do with the ordinary 21.12-centimeter neutral-hydrogen radiation; but of course you realize that our big paraboloid bowls can catch anything from hydrogen hiss to low-flying bats. Remember the Christmas celebration at New Caanan that was telecast to earth a couple years back? That show was caught by the six-hundred-foot receiver





at Green Bank, West Virginia, and rebroadcast by C.B.S.”

#### IV

**W**e entered the Big Tank's common room, where a few of our colleagues sat reading or writing notes for tomorrow's classes

— talking; playing chess or bridge; or sitting behind the closed glass doors of the TV alcove watching the picture through stereo spectacles. We entered the alcove at the other end of the room, where the record-player and music library were, and closed the door.

Dorsey took a three-inch spool





of magnetic thread from his shirt pocket and fit it to the playback head of the machine.

"I'm interested in your uninstructed reaction, John," he said. "So don't ask me any questions till you've heard the whole sequence."

"Spin it, professor," I said.

The Australian thread had a noisy background, sounding like a dozen rashers of bacon tossed into a too-hot skillet. Over this hissing, the code began to sound. "DIT . . . DIT . . . DIT-DIT . . . DIT-DIT-DIT-DIT . . . DIT-DIT-DIT . . . DIT - DIT - DIT - DIT - DIT - DIT - DIT - DIT . . . DIT -



DIT-DIT-DIT . . ." I dutifully entered my count of each burst of DIT's in my pocket notebook. The sequence went: 1, 1; 2, 4; 3, 9; 4, 16; 5, 25; 6, 36; then 5, 2, 49; 8, 64. There the count stopped climbing and commenced again with the pair of ones, to repeat the whole set again.

Dorsey cut off the machine. "I've got four hours of the same thing on this thread," he said. "Want to hear it all, or have you got it already?"

"It's obvious, up to a point," I asked. "It's a table of the first eight natural integers and their squares, except for the number seven, which for some reason is split in two."

"It took me quite a while to recognize what happened to that seven," Dorsey said. "Listen to it again." He spooled the thread back and I listened again to the fractured seven: "DIT - DIT - DIT - DIT - DIT . . . DIT - DIT." Then again the forty-nine clicks, seven-squared. Dorsey switched off the player.

"Let's have the distillate of your cerebrations now, Brothers Bogardus," he said, dropping into the deep, red-leather easy chair beside the thread-player.

"It's syncopation, Brother Dorsey," I said.

"I'd never have given my own modest observations so high-flown a title," Dorsey said. "I'd simply

have called it, country boy at heart that I am, 'Shave-and-a-Haircut, two-bits!'"

"So it is," I said. "Now we've deciphered that broadcast, and listened to the singing commercial. But I'm still puzzled, Bud. We don't have the sponsor's name and address; and I'm not at all sure I caught the name of his product. What's he advertising?"

"His presence," Dorsey said. "I interpret the message as a simple CQ."

"Seek you?" I asked.

"Yes. Radio-ham code for, 'I'm lonely — will somebody please talk to me?'"

"I'LL accept that interpretation only till I can think of one even more fantastic," I said.

"O.K., John," Dorsey said. "Getting the address of the station was a simple exercise, thanks to my Digger confreres in Adelaide and the men at Harvard's South African radio observatory. We first heard the message two years ago. It's still being broadcast, unchanged. The fist on the key that sent out our arithmetic message belongs to someone in the neighborhood of Alpha Centauri."

"Hot damn!" I said. "But why didn't I know about this? I read *Time*, and all. Why wasn't this headlined?"

"Because it's guesswork," Dorsey explained. "This may be the



result of some cosmic coincidence as unrelated to intelligent planning as Bode's Law."

"You'll have to explain that to this groundsman," I said.

"Bode's law, too, looks like an intelligently devised code of some sort," Dorsey said. "Take the series: 0, 3, 6, 12, 24, 48, 96, 192. Add 4 to each number, and divide by ten. The result will be, when you take the asteroid belt into consideration and fudge a little, very nearly the proportional distance from the sun of the first seven planets. Accident, or evidence of intelligent planning? Turned out there are excellent physical reasons for this relationship, reasons old Johann Elert Bode couldn't possibly have guessed. Things like this make astronomers leary of teleology. Make them avoid the splendid guess."

"Go ahead, make a splendid guess," I said. "I won't report you to the Astronomers Union."

"Sure," Dorsey said. "Alpha Centauri, as the U. Cal's five-meter Luna 'scope demonstrated several years ago, has a system of at least three planets. We don't know much about those planets except their time of revolution."

"And that one of them has a citizen clever enough to calculate natural squares and build a radio transmitter . . ."

". . . one hell of a transmitter!" Dorsey said.

". . . and whistle, 'Shave and a Haircut, Two Bits,'" I went on; "which musical interlude argues for a certain degree of conviviality on the part of our Centaurian. This thing of his message, though. Do you think he was just looking for other hams to talk with?"

"**T**HEN he's awfully patient, sending out the same 'CQ' for two solid years," Dorsey said. "It's hardly practical to communicate between stars, John. Broadcasting from here to Alpha C. and back, it would take more than nine years just to ask how's the wife and kids."

"The way it looks to me, our friend out there got the duty of cutting an educational recording to be broadcast automatically to the rest of the galaxy. Kind of a lighthouse, to help his race get in touch with any relatives it might have. That same recording has been played over and over again ever since, sending To Whom It Might Concern its dual message. Simple math — and the most persistent rhythmical cliché known to man."

"What's being done about it?" I asked.

"We've answered," Dorsey said. "A big radio noise on the moon is broadcasting the same message, minus the syncopation, and adding the next two terms; all this beamed toward Alpha Centauri. And two



years ago, the Defense Department cut other programs to the bone to start construction of *Orion Zeta*, the sixth of the big nuclear-pulse ships. She's up in von Weizsäcker Crater on the back of the moon now, John, nearly finished. She's not meant to call at solar-system ports."

"The government thinks, and you think, that our operator four and a half light-years from here was human," I said.

"I can't speak for the government. But that's what I think. Isn't it human to toss notes out to sea in bottles? What's more human than dropping a joke into an arithmetical table?"

"All we've got to do to prove your splendid guess is to hijack a germ-free spaceship," I said. "You and me and any of the other Lapins who feel as we do. We'll go shake the hand — or other prehensile member, if he's not human after all — of our Centaurian thread-jockey. What's to keep our feet in the mud, when our heads are 'way the hell out in a southern constellation?"

"I gather, Herr Doktor, that you jest," Dorsey said. "If you were serious, I'd point out one minor flaw in your blueprint for adventure. It would take our little band of pirates one hundred twenty-five years to get to Alpha Centauri, after we'd stolen the ship. That's with the gas-pedal to the floor."

"I was joking," I said. "I was pretending to be the hero of one of those TV space-operas we used to watch . . . But if I were serious, I don't think a mere century and a quarter would faze me. We couldn't reach our goal in person, Bud; but we could send our children's children. All we'd need to make the trip, if I were serious about my suggestion, would be a few more volunteers. A proper proportion of those volunteers had best be philoprogenitive females."

"**D**O you think the BICUSPID brass will be happy to see its expensive guinea-pigs taking off into space?" Dorsey asked. "Since '29, John, there's been eighty million bucks poured into gnotobiotics here at Central University. We're the payoff. We can hardly expect Dr. McQueen to stand on the launching-pad, tossing roses and shouting *Bon Voyage* as we blast off forever."

"I think they could be persuaded to be, if not enthusiastic, at least resigned to our departure," I said.

"It does prisoners good to plot escape-plans, even when they're as obviously fantastic as this one," Dorsey said. "Go on, John."

"As you say, our purpose in this adventure would be to escape," I said. "There's no place on earth that can take us, so we're forced to escape into space. We'll have



to talk this up around the Big Tank to see how many want to break out with us. What the sex-distribution of the volunteers is, whether we've got the right range of specialists to man a spaceship. Right, Bud?"

"It's your dream," Dorsey said.

"O.K. Immermann Man appears to have been germ-free," I said. "Perhaps his culture had been gnotobiotic for so long that they'd forgotten the existence of microorganisms. Landing on other planets, they'd not rediscover the danger of infectious disease till it was too late. Suddenly they'd start falling, dying of illnesses as mysterious to them as the plague was to men of the Renaissance. This may have been the manner in which the original owner of the Immermann skull died, on Mars. We have a reasonable suspicion that there was germ-free human life in our corner of the galaxy twenty thousand years ago. Perhaps, as you suggested, these visitors were members of an exploration party. From Alpha Centauri? Is our ham who hammered out the table-of-squares a member of that gnotobiotic race? Is he our brother in purity?"

"Go on, Johnny," Dorsey said. "You ain't even winded, yet."

"The *Orion Zeta* is being built for deep space," I went on. "Some group from earth is certain to set out in her on the four-generation hop to Alpha Centauri. Would it

be morally right to allow this group of ambassadors to be made up of 'normal,' contaminated humans? To carry to a possibly defenseless population a mixed bag of goodies like *Micrococcus ureae*, *Bacillus vulgaris*, *Staphylococcus aureus*, *Mycobacterium tuberculosis* — a whole spectrum of benign and malignant bacteria? Remember, Bud, bugs that are benign or only mildly pernicious on earth might prove to be killers away from home."

"Lots of maybes," Dorsey said. "Lots of perhappes."

"I'VE got one more shaft in the quiver," I said. "This one's got a poisoned point, and it carries the names of our keepers. It's dirty, Bud. It's hardly fair to Dr. McQueen to use such blackmail."

"Blackmail sounds like just what we need," Dorsey said.

"O.K. Thirty of us were born into the Big Tank," I said. "One has already died as a result of his mental state, caused by imprisonment. Another is certain to die within the next few days. Had they been entirely sane, Mike Bohrman and Mary deWitte wouldn't have shed their sterility-suits outside the Tank. Without purpose to their lives, they cracked up."

"Two of us dead in the first twenty-six years of the human studies at BICUSPID," I went on. "Two, out of an original thirty. An



attrition-rate of six and seven-tenths percent. How many more Lapins will wander out to commit innocent suicide in the snow, their minds messed up by the frustration and hopelessness of the guinea-pig way of life? How many more of us will escape from the Big Tank into the morgue? The *Orion Zeta* could be our salvation, Bud. It could give us the sort of purpose human beings must have in order to live."

Dorsey shook his head. "The Defense Department set up its young Clydeside in von Weizsäcker Crater just to build, test, and launch one ship: the *Zeta*. Two years of round-the-chronometer work have been poured into her," he said. "She's cost four billion dollars so far, Johnny; and they haven't bought the living-room furniture yet. I hardly think the generals will volunteer the result of all this effort to serve as psychotherapy for twenty-eight neurotic Hoosiers."

"You miss the point, Bud," I said. "We Lapins were born to crew the *Zeta*. Where else could you find a crew that's already spent twenty-odd years or so inside a box, living together in close quarters, being conditioned against claustrophobia? This Big Tank of ours could be a grounded spaceship, Bud! It's airtight, armored against outside dangers, even has the formaldehyde sump to serve us for

airlock. What's a sterility-suit, anyway, but a special breed of space suit? Could you find a better crew than us twenty-eight, skilled in two dozen professions, young, sound of wind and limb, and willing as hell to take on the job? None of whom will ever have appendicitis, halitosis, toothache, barber's itch, or athlete's foot? Any one of whom can, in case of accident, first-aid his wounds with a spit-damp handkerchief, and heal wholesome? Man, we're what those generals have been dreaming of! Once we've been trained to aim that big ship and kick her off the back of the moon, we'll be the finest extra-solar crew that ever blasted free of the system!"

"One question," Dorsey said. "Where do I sign Ship's Articles?"

**D**R. McQueen was in Chicago for three days before he found Mary Lofting, née deWitte. She had awakened that morning suffering from a headache, a stiff neck, and four degrees of fever. Her husband had called an ambulance to take her to Michael Reese Hospital. There, just before she'd lost consciousness, Mary had asked a nurse to call BICUSPID. The C.U. authorities had in turn called Dr. McQueen in Chicago.

She came home on a stretcher, a bottle of fructose solution dripping into her veins. Mary had already been loaded with a double-barreled



ed shotgun-blast of every antibiotic she could safely take. Dr. McQueen rode back to the University in the ambulance with her, and with her husband. Lofting, holding the girl's hand, explained time after time that she'd never told him about the likely consequence of her removing her chastity-suit in an unchaste world. The basketball player said he'd never forgive himself if she didn't recover.

Mary was taken to the C.U. hospital. Wearing a sterility-suit, I attended her examination, which was conducted by my chief-of-service, the staff pathologist, as well as the hospital's internist and neurologist. I took a few cc's of Mary's cerebrospinal fluid back with me to the BICUSPID contaminated labs. There, to anticipate a few days' deliberate bacterial growth in media, her meningoen- cephalitis was discovered to have been caused by *Erysipelothrix monocytogenes*, an organism whose more usual victims are rabbits. Mary's husband could explain her coming in contact with so exotic a pathogen only by the fact that they'd visited the Brookfield Zoo on the second, and last, day of their honeymoon.

By the time these technical details were known they were academic. The epidemiological problem had become secondary to the pathological. Mary Lofting had died.

I was asked to assist Dr. McQueen and the senior pathologist at autopsy — I was, after all, a resident in pathology, and had besides a special interest in this case — but I found the job more than I could take. Mary had been a sister to me for twenty-three years. In tears, I left the morgue during the classic cruciform incision.

I FOUND the Firebird in the library. I recognized her through the anonymity of her chastity-suit by the characteristic pose of her head and arms as she sat reading: elbow braced on the table-top, her right fist blocked stubbornly against the plastic cheek of her helmet, her left arm curved around the book as though to be a break-water against distraction. I sat beside her, and said, "Dorothy."

Without a word she closed her book, stood, and replaced it on the shelf. We walked hand in hand out into the autumn campus.

"Last year," I said, "it was Mike Bohrman, walking through snow-drifts in his suit-shorts, wanting for once in his life to feel the real world against his skin. So he died. Five days ago, Mary deWitte married the man she loved. So she died," I said.

"Our life isn't generally as hopeless as that," the Firebird said.

"No," I said. "We're fed and entertained. We're being educated at



one of the finest universities in the world — for us, she's been a genuine, homogenized-milk Alma Momma. She even gives us an allowance to buy airmail stamps for our collection, or bar-bells, or gas for our sports-car. She's given us everything we need for happiness. Everything, Firebird, but purpose. That's why we're all going nuts — why Mike went barefoot in the snow and Mary used love for a suicide-weapon. That's why we've got to break free."

"Free?" she asked. "You mean, free to step outside the Big Tank, shed our sterility-suits, turn septic — and die?"

"I mean free to step off earth."

We sat by mutual consent on a bench beneath a sugar maple, brushing aside half an inch of multicolored leaves. I told the Firebird of the broadcast from a southern star, and about the Immermann skull. I told her all I knew about the Orion rockets, the nuclear-pulse ships that had gone through five prototypes to reach the *Zeta*. "She's built to travel light-years," I said. "I'm going with her when she leaves."

"Of course, I'm going with you," she said. "Your spacemen will need a dietitian to make metabolic sense out of algal soups and hydroponic salads for the first couple of generations, and to teach the youngsters to take over the kitchen once they're on their own."

"Firebird," I said, "I'm happy to welcome you aboard. Now we've got to get that ship."

"We'll get it," she said. "Understand, Johnny, it's not the professional challenge that makes me want to blast off for Alpha Centauri with four generations to feed. I've got no special urge to tame frontiers. The reason I'm going — forgive me for mentioning it again, and cold sober — is to stay near you."

I stood up, drawing her up after me, and was struck again by the aptness of the nickname, "chastity-suit."

"Perhaps I've overestimated the effectiveness of a certain taboo," I said. "Come on, sweet Firebird. Let's get back to the Tank to help Bud recruit the rest of our crew."

**C**OLONEL Barrett was young for eagles. My fellow volunteers-designate and I, all twenty-eight of us, were gathered in the lounge of English Hall, creaking and wheezing in our sterility-suits, looking very ready for hard space.

The colonel wore crisp blues. His tunic was decorated by a triple row of medals-for-merit. It was not his fault that he wore no battle-stars. Barrett had graduated from the Air Academy into our seemingly endless *Pax Desperandum*. He'd never had a chance to see a roentgen radiated in anger. The Marsman Badge at the center of



his left breast pocket was one rarely seen: the circle-with-arrow symbol of Mars had within it a "III," signifying that its wearer had been a member of the Third Mars Expedition, back in the days when a flight to Mars had been something more than a teamster's run. The Marsman Badge was balanced by the star-topped, laurel-wreathed — and anachronistic — silver wings of a Command Pilot.

As I shook hands with Colonel Barrett I found it difficult to conceal the envy that writhed in me. He'd seen the continents spread cloud-flecked on the receding, curving earth, the stars shining beside the sun against the black sky. He'd splashed across the dust-carpet of the moon, tasted water melted from the polar cap of Mars. As a member of Expedition Three, he'd been with the crew of the *Orion Gamma* when Immermann discovered the twenty-thousand-year-old skull at the base of Roosevelt Ridge.

Colonel Barrett addressed his remarks to me. "Central University," he said, "will lose the results of an eighty-million-dollar investment if you people leave. They'll be getting off cheap, compared to us. The Defense Department has been requested to turn over to you twenty-eight untrained groundsmen the greatest spaceship yet built, the first of the interstellar ships. The *Zeta* cost the taxpayers

four dollars a pound to build. She weighs five hundred thousand tons, Dr. Bogardus."

"You're mistaken, Colonel, when you say that the University's investments in gnotobiotic research over the past eighty years will be lost if we Lapins end our part of the experiment. That's not true. That investment has been repaid many times over. More has been learned of human physiology, nutrition, and disease processes in the twenty-six years' study of germ-free humans than was learned concerning these subjects during any similar period in medical history.

"And, Colonel," I went on, "we're not untrained. Bud Dorsey, to your right, is an astrophysicist who worked with the Agassiz Observatory team in mapping the interstellar anti-matter dust clouds. Dr. Keto Hannamuri is a pediatrician. Dorothy Damien, our Firebird, is a dietitian. Fizz Ewell is a nuclear engineer. Karl Fyrmeister's degree is in chem engineering, as is Janie Bohrman's. Gloria Moss is working on her doctorate in sociology. Her thesis, Colonel, deals with the social dynamics of small human groups such as ours. Alfred MacCoy, standing behind you, has written three symphonies and an oratorio so far; and R.C.A. Victor has threaded them all with the New York Philharmonic. Lucy Cashdollar has had her works of sculpture displayed in the National



Gallery and at London's Tate. There are some few resources here, Colonel."

"I didn't intend to belittle your intellectual accomplishments, Dr. Bogardus," the Colonel said. "I've read your dossiers. They're impressive. When I called you untrained, what I really meant was that you're totally unskilled in terms of my own specialty. I meant that none of you knows anything of the skills of simple chemical rocketry, much less the techniques required to lift half a million tons on a nuclear-pulse thrust."

"We can learn," I said.

"I hope so," Colonel Barrett said, "because I've been ordered to teach you."

**"W**E'RE in?" Bud Dorsey demanded.

"You're in," Colonel Barrett said. "The decision in the Pentagon went against my recommendation that professionals in rocketry be recruited for the Alpha Centauri flight. The generals liked your argument, Dr. Bogardus, that we should send a germ-free ship and a germ-free crew to a possibly germ-free planet. In a sense, this is tradition. Back in the '50s, moon-missiles were sponged down with Lysol before launching, just in case they got where they were aimed at. Our people didn't want to contaminate the moon's surface with earthly micro-

organisms, cluttering up the picture for the bacteriologists who were scheduled to arrive later. The Chief of Staff said that if there is a germ-free population on one of the Centaurus planets, we must not initiate our contact with them by handing out the sort of prizes Cook's crew brought to the South Seas — measles, tuberculosis, smallpox. We can't know that even innocuous bacteria might not be fatal to a gnotobiotic, alien population. So you go."

"Colonel," I said, "I'm sure that Washington didn't give up the Zeta to us out of sheer altruism. What's their real reason?"

"Where else could we get a crew of twenty-eight men and women who've given proof they can live together for a long period of time, peaceably, retaining a fair degree of sanity? Miss Moss's studies in group dynamics were most interesting to the Chief of Staff. Doubtless they did much to influence his decision in your favor."

"There's one thing I don't understand, Colonel Barrett."

"What's that, Miss Damien?" he asked.

"Why is it that you seem so unhappy about our being accepted as the Zeta's crew?" she asked. "After all, you've been given the duty of training us to take her between stars. That's a pretty important assignment, isn't it, even for a bird colonel?"



"You're right, Miss Damien," Colonel Barrett said. "My new assignment is a vital one. You must forgive me if I seemed curt and unfriendly." He paused. "I've been trying to hide my feelings, but evidently I failed. You see, Miss Damien, my wife and I had headed the previous list of volunteers — the contaminated crew."

**L**OOKING from the ports of the rocket that had brought us from Memorial Orbital Station, I'd thought von Weizsäcker Crater the most impressive sight I'd ever seen. The *Orion Zeta* looked from our height like nothing so much as a miniature silver cocktail-shaker, glinting at the center of the vast circle of von Weizsäcker.

Later, standing a few hundred feet from *Zeta's* base, I'd found the order of impressiveness reversed. The great ship was a tower of fifteen hundred feet, blacking out the stars like a geometric mountain; while the crater's twenty-thousand-foot ringwall, so far away in all directions, was no more obtrusive than a decorative hedge. This ship, I thought, is the intelligent comet on which we'd be passengers until the day we died, some two and a fraction light-years away from home. We were guaranteed immortality, though, in our offspring. Our descendants would very literally become flesh of our flesh, bone of our bone, as our bodies were re-

surrected to vegetable life in the hydroponic tanks of the ship.

We Lapins clustered close together on the moon-dust, staring up the sides of our ship. Her upper reaches were hidden by the globular bulge of the enormous thrust-chamber, where kiloton capsules of nuclear fuel would be fired, three a second, to blast us into space. In this great ship our children would be born and would die, and our grandchildren as well. From the *Zeta*, our aged great-grandchildren, limping down long ladderways to the exit-hatches on the arms of their teen-aged grandsons, would step onto the soil of a planet that circled Alpha Centauri.

One hundred and twenty-five years from now, I thought, clasping the Firebird's hand in mine. So little in history, so big in human lives!

One hundred and twenty-five years ago, the Brooklyn Bridge had been brand-new. U.S. Grant, defrauded and cancer-ridden, was gritting his teeth against the pain to write his memoirs. President Chester A. Arthur had just signed into law a bill prohibiting polygamy in the territories.

As far away as those things lay our goal.

We entered the sublunarian chambers beneath the ship. Dr. McQueen had preceded us here; and under his direction the *Orion Zeta* had been made as aseptic as



the Big Tank itself. Colonel Barrett and his subordinates who'd train us to operate the *Zeta* would have to wear sterility-suits aboard her, and would enter through the formaldehyde sump that was now her only entrance. Even the dust of the moon was not entirely sterile.

The Firebird took my arm to urge me toward the liquid gateway to the ship, eager to see our new home. "Wait," I said, holding her back till all the others had gone through the antiseptic pool.

"Cold feet, Johnny?" she teased me.

"Gloria Moss once told me, Firebird, that a healthy respect for tradition is essential to the organic strength of a group such as ours," I said. "So . . ." I bent and picked the Firebird up, her weight moon-trimmed to that of a three-year-old. She put her arms around my neck as I carried her down the ladder into the poisonous decontamination tank that was our front door to Alpha Centauri.

— ALLEN KIM LANG

