

The Woman in Del Rey Crater



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FLATLANDER

The Collected Tales of Gil "The Arm"
Hamilton

by Larry Niven

"The Woman in Del Rey
Crater"

We were falling back toward the moon.
It's always an uneasy sensation, and in a
lemmy I felt frail. A lemmie is a

spacecraft but a very small one; it won't even reach lunar orbit.

Lawman Bauer-Stanson set the attitude jets popping. The lemming rolled belly up to give us a view. "There, Hamilton," she said, waving at the bone-white land above our heads. "With the old VERBOTEN sign across it."

It was four T-days past sunrise, and the shadows were long. Del Rey was well off to the side, six kilometers across, almost edge-on and flattening as we fell. There were dots of dulled silver everywhere inside the crater, clustering near the center. A crudely drawn gouge ran straight across the crater's center, deep and blackly shadowed. That line

and the circle of rim formed the VERBOTEN sign.

I asked, "Aren't you going to take us across?"

"No." Lawman Bauer-Stanson floated at her ease while choppy moonscape drifted nearer. "I don't like radiation."

"We're shielded."

"Suuure."

The computer rolled us over and started the main motor. The lunie lawman tapped in a few instructions. The computer was doing all the work, but I let her land us before I spoke. She'd put

us a good kilometer south of the crater rim.

I said, "Being cautious, are we?"

Bauer-Stanson looked at me over her shoulder. Narrow shoulders, long neck, pointed chin: she had the lunies' look of a Tolkien elf matriarch. Her bubble helmet cramped her long hair. It was black going white, and she wore it in a feathery crest, modified Belt style.

She said, "This is a scary place, Ubersleuth Hamilton. Damn few people come here on purpose."

"I was invited."

"We're lucky you were available. Ubersleuth Hamilton, the shield on a lemming will stop a solar storm, the wildest solar storm. Thank God for the Shreveshield." The radiation signal pulled at Bauer-Stanson's eyes and mine. No rads were getting through at all. "But Del Rey Crater is way different."

The Earth was a blue-white sickle ten degrees above the horizon. Through either window I could see classic moonscape, craters big and little, and the long rim of Del Rey. Wilderness.

"I'm just asking, but couldn't you have set us down closer to Del Rey? Or else near the processing plant?"

She leaned across me, our helmets brushing. "Look that way, the right edge of the crater. Now lots closer and a bit right. Look for wheel treads and a mound--"

"Ah." A kilometer out from the rim wall: a long low hill of lunar dust and coarser debris with a gaping hole in one end.

"You should know by now, Hamilton. We bury everything. The sky is the enemy here. There's meteors, radiation ... spacecraft, for that matter."

I was watching the mound, expecting some kind of minitractor to pop out.

She caught me looking. "We turned off

the waldo tugs when we found the body. They've been off for twenty hours or so. You get to tell us when we can turn them on again. Shall we get to it?" Bauer-Stanson's fingers danced over pressure points on the panel. A whine wound down to profound silence as air was sucked from the cabin.

We were dressed alike in skintight pressure suits under leaded armor, borrowed, that didn't fit well. I felt my belly band squeeze tight as vacuum enclosed us. Bauer-Stanson tapped again, and the roof lifted up and sideways.

We moved back into the cargo bay and positioned ourselves at either end of a

device built along the lines of a lunar two-wheeled puffer. We lifted it out of the bay and dropped it over the side.

The Mark Twenty-nine's wheels were toroidal birdcages as tall as my shoulders with little motors on the wheel hubs. In lunar gravity wheels don't have to be sturdy, but a vehicle needs a wide stance because weight won't hold it stable. The thing stood upright even without the kickstands. Low-slung between the wheels, a bulky plastic case and a heavy lock hid the works of Shreve Development's experimental radiation shield, power source, sensor devices, and other secrets, too, no doubt. A bucket seat was bolted to the case,

with cameras and more sensing devices behind that.

Bauer-Stanson scrambled after it. She pulled it several feet from the lemmy and turned on the shield.

I'd done spot repairs on the Shreveshield in my own ship, years ago when I was a Belt miner. The little version is a flat plate, twelve feet by twelve feet, with rounded corners and a small secured housing at one corner. Fractal scrollwork covers it in frilly curves of superconductor, growing microscopically fine around the edges. You can bend it, but not far. In my old ship it wrapped around the D-T tank, and the shield effect enclosed everything

but the motor. In a police lemmy it wraps the tank twice around.

No Shreveshield could have been fitted into the Mark Twenty-nine puffer.

But a halo had formed around it, very like the nearly imperceptible violet glow around the lemmy itself. I'd never seen that glow before. The rad shield normally doesn't have to fight that hard.

Lawman Bauer-Stanson stood within the glow. She waved me over.

I crossed the space between one shield and the other in two bounces. Vacuum and hard bright stars and alien landscapes and falling don't scare me,

but radiation is something else.

I asked, "Lawman, why did we only bring one of these puffers?"

"Ubersleuth Hamilton, there is only one." She sighed. "May I call you Gil?"

I'd been getting tired of this myself. "Sure. Hecate?"

"He-ca-tee ," she said. Three syllables. "Gil, Shreve Development makes active radiation shields. They only make the two kinds, and they're both for spacecraft."

"We use them on Earth, too. Some of the old fusion plants are hotter'n hell. The

Shreveshield was big news when I was, oh, eight years old. They used it to make a documentary on South-Central Los Angeles, but what got my attention was the spacecraft."

"Tell me about it. Thirty years ago a solar storm would have us marooned, huddling underground. We couldn't launch ships even as far as Earth."

The big shields had come first, I remembered. They were used to protect cities. There was a Shreveshield on the first tremendous slowboat launched toward Alpha Centauri. The little shields, eight years later, were small enough for three-man ships, and that was enough for me. I lofted out to mine the

Belt.

"I hope they got rich," I said.

"Yah. When nobody gets rich, they call that a recession," Hecate said. "They spend some of the money on research. They'd like to build a little man-sized shield. They don't talk about the mistakes, but the Mark Twenty-nine is what they've got now."

"You must be persuasive as hell."

"Yonnie Kotani's my cousin's wife. She let us borrow it. Gil, whatever we learn about this is confidential. You are not to open that lock, ARM or no. Puffer, " she said in fine disgust.

"Sorry."

"Yah. Well, this version works all the time, Yonnie said. It's still too expensive to market."

"Hecate, is it just conceivable," I wondered, "that Shreve would like me to test their Mark Twenty-nine active shield for them?"

She shook her head; the pepper and salt crest swirled inside the helmet. Amused. "Not you . A dead flatlander celebrity riding their Mark Twenty-nine Shreveshield? They could watch your death grin in every boob cube in the solar system! Shall I take the first ride?"

"I want a fresh look. I don't want to deal with your tire prints." I boarded the Mark Twenty-nine before she could object.

She made no move to stop me. I said, "Check the reception."

She was into the lemming's cabin in a lovely graceful leap. She brought up the feed from my helmet camera. "You're on, nice and ... actually the picture's jumping a little. Good enough, though."

"Keep your eye on me. You can coach." I kicked the Mark Twenty-nine into gear and rolled toward the rim.

I'd been wakened from a sound sleep by

her call. They keep the same time over the whole moon, so it was the middle of the night for Hecate Bauer-Stanson, too.

Ah, well. I had time to shower and get some breakfast while she landed and refueled, and that's never guaranteed. But it didn't sound like the intruder in Del Rey Crater needed immediate justice.

During the flight I'd had a chance to read about Del Rey Crater.

Just before the turn of the millennium, Boeing, then more or less an aircraft company, had done a survey. What kind of customer would pay how much for easy access to orbit?

The answers it got depended heavily on the cost of launch. A hundred thirty years ago those costs were the stuff of fantasy. NASA's weird political spacecraft, the Shuttle, launched for three thousand dollars per pound and up. At that price there would be no customers at all: nothing would fly without tax-financed kickbacks, and nothing did.

At two hundred dollars a pound--then considered marginally possible--the Net could afford to hold gladiatorial contests in orbit.

Intermediate prices would buy High Frontier antiweapons, orbiting solar power, high-end tourism, hazardous waste disposal, funerals ...

Funerals. For five hundred dollars a pound, an urnful of ashes could be launched frozen in a block of ice for the solar wind to scatter to the stars. They launched from Florida in those days. Florida's funeral lobby must have owned the state. Florida passed a state law. No funeral procedure could be licensed in Florida unless grieving relatives could visit the grave ... via a paved road!

Boeing also considered disposal of hazardous waste from fission plants.

You wouldn't just fire it off. First you'd separate the leftover uranium and/or plutonium, the fuel, to use again. Then you'd take out low-level radioactives

and bury them in bricks. The truly noxious remainder, about three percent by mass, you would package to survive an unexpected reentry. Then you'd bomb a crater on the moon with them.

Power plant technology would improve over the decades to come. Our ancestors saw that far. In time that awful goo would once again be fuel. Future stockholders would want to find it.

Boeing had chosen Del Rey Crater with some care.

Del Rey was little but deep, just at the moon's visible rim. Meteors massing 1.1 tonnes, slamming down at two kilometers per second, would raise dust

plumes against the limb of the moon. An amateur's telescope could find them. Lowell Observatory could get great pictures for the evening news: effective advertising, and free. The high rim would catch more of the dust ... not all but most.

My search program had turned up a Lester del Rey with a half-century career in science fiction. The little crater had indeed been named for him. And he'd written an early story about an imaginary fission power plant: "Nerves."

To a man used to moonscapes the view from the crater rim was quite strange. It's not unusual for craters to overlap craters. But they clustered in the center,

so that the central peak had been battered flat, and every crater was the same size. Yet more twenty-meter craters shaped the line that made Del Rey into one huge FORBIDDEN sign.

Everything around me was covered in pairs of tractor treadmarks a meter apart, often with a middle track as of something being dragged. A kilometer away, the tread marks thinned out and disappeared. There I began to see silvery beads at the center of every crater.

And one a little shinier, the wrong color, off center. I used the zoom feature in my faceplate to expand the view.

A pressure suit lay facedown. It was a hardshell, not a skintight. I was looking at the top of its head.

Corrugated footprints ran away from the body, three and four yards apart. The intruder had been running toward the rim to my right, south-southeast, leaping like a Lunar Olympics runner.

"Still got me, Hecate?"

"Yes, Gil. Your camera's better than the one on the waldo tug, but I can't make out any markings on the suit."

"It's head-on to me. Okay, I'm setting a relay antenna. Now I'll get closer." I started the Mark Twenty-nine rolling

into the crater. If the shield around me was glowing, I couldn't see it from inside.

"I think you were wrong. That isn't a flatlander's suit. It's just old."

"Gil, we went to some effort to get the ARM involved. That was never a lunie design. It's too square. The helmet's wrong. This fishbowl design we're wearing, we were already using it when we built Luna City!"

"Hecate, how did you find this thing? How long has it been lying here?"

Hesitation. "We don't send sputniki over Del Rey Crater very often. It's hard on

the instruments. Nobody saw anything odd until the waldo tugs went in, and then we got a nice view through a tug's camera."

Even if a few sputniki did cross over Del Rey, the suit wouldn't contrast with the other silver dots around it. How long had it been here? "Hecate, divert a sputnik or a ship with a camera. We need an overhead view. Do you have the authority, or do I have to play dominance games?"

"I'll find out."

"In a minute. These waldo tugs. What are you stockpiling? The moon has helium-three fusion and solar power, too!"

"Those old impact tanks go off to the Helios plants."

"Why?"

Hecate sighed. "Beats the hell out of me. Maybe you can find out. You've got clout."

I saw a canister broken open and steered wide around it. Invisible death. I couldn't see any kind of glow around me: no evil blue Cherenkov radiation and nothing from my own shield, either.

What if my wheels broke down? I might trust the Shreveshield, but how careful had Shreve Development been with something as simple, as off-the-shelf as

a pair of power wheels? I couldn't leave the Mark Twenty-nine without frying ...

Dumb. I'd just carry it out. Hecate and I had picked it up easily. Why does radiation make people so nervous?

I stopped a little way from the downed suit. There were no tracks nearby, only the marks under the gloves and boots. The deader had clawed at the dust, leaving finger and toe marks. I ran the Mark Twenty-nine in a half circle, helmet camera running. Then I pulled as close as I could get and lowered the stand.

At this moment I still couldn't testify that that wasn't an empty suit. The only

markings were the usual color-coded arrows, instructions for novices. They seemed faded.

I didn't much want to step down. Radioactive dust on my boots would be carried inside the Shreveshield. What I could do was lean far over, gripping the belly casing of the Mark Twenty-nine with legs and hands, and reach into the suit with my imaginary arm.

It's like reaching into water rich with weeds and scum. My fingers trail through varying texture. Yup, there's someone in there. It seems dehydrated. Corruption isn't obtrusive, and for this I'm grateful. Maybe the suit leaked. The chest ... a woman?

I reach around to touch the face lightly. Dry and ancient. I grimace and reach, trailing phantom fingers through chest and torso and abdomen.

"Gil, are you all right?"

"Sure, Hecate. I'm using my talent to see what I can feel out."

"It's just that you didn't say anything for a while. What talent?"

I never know how someone will react. "Wild talent. I've got some PK and esper. It amounts to being able to feel around inside a locked box with an imaginary arm and hand. I can pick up

things, little things. Okay?"

"Okay. What have you got?"

"She was a woman. Hecate, she's shorter than I am."

"Flatlander."

"Likely. No markings on the suit. Corruption isn't advanced, but she's dried out like a mummy. We should check the suit for a leak." I continued to search as I talked. "She's covered with medical telltales outside and in. Big, old-fashioned things. Maybe we can date them. Her face feels two hundred years old, but that's no sign of anything. Air tanks are dry, of course. Air pressure's

near zero. I haven't found an injury yet.
Hel -lo!"

"Gil?"

"Her oxygen flow is twisted right over,
all the way up."

No comment.

I said, "Bet on a leak. Even money, a
leak got her before the radiation did."

"But what the hell was she doing there?"

"Funny how that thought occurred to both
of us. Hecate, shall I collect the
body?"~"I sure don't want it in my cargo
hold. Gil, we don't want it on the Mark

Twenty-nine. If you let me start up the waldo tugs, I can guide one to the body and move it that way."

"Start 'em up."

I rolled past the dead woman. I stayed wide of the line of footprints leading north- northeast, but that was what I was following.

... Bounding across a crater that was the most radioactive spot in the solar system, barring the sun itself and maybe Mercury. Frightened out of her mind? Even if there was no leak, it was a sane decision, giving herself maximum oxygen pressure, nothing left for later as she ran for the crater rim like a damned

soul escaping hell. But what was she doing in the crater?

I stopped. "Hecate?"

"Here. I've started the waldo tugs. Shall I send you one?"

"Yah. Hecate, do you see what I see? The footprints?"

"They just stop."

"In the middle of Del Rey Crater?"

"Well, what do you see?"

"They start here in the middle, already running. They get halfway to the rim. The

way my rad sensor is losing its lunch, I'd say she made a good run of it."

I trundled back to where I'd left the corpse. There was a signal laser in the service pack on my back. I spent a few minutes cutting an outline in the rock around the corpse.

"Hecate, how fast are those tugs?"

"Not exactly built for speed. It's more important that they don't turn over, but they'll do twenty-five K on the flat. Gil, you'll have your tug in ten minutes. How's your shield holding?"

I looked at the rad counters. Hell raged around me, but almost nothing was

getting inside the shield. "Whatever got through, I probably brought it in on my boots. From outside Del Rey at that. I'd still like to leave."

"Gil, give me a camera view of the boots."

I wheeled into place and leaned far over the corpse's boots. Without Hecate's mention, I might never have noticed them. They were white. No decoration, no custom touches. Big boots with thick soles for lunar heat and cold, heavy treads for lunar dust. Built for the moon. But of course they would be even if they'd come straight from somewhere on Earth.

"Now the face. The sooner we find out who she was, the better."

"She's lying on her face."

"Don't touch her," Hecate said. "Wait for the tug."

I spent some of my waiting time easing a rope line under the body. Then I just waited.

A pair of arms on tractor treads was bumping toward me. It crossed crater after crater like it was bobbing on waves. It was making me queasy--if that wasn't the radiation--but the counters were quiet. I watched, and it came.

"I'll turn her over first," Hecate told me. Metal arms a little bigger than mine reached out. I lifted the rope. The arms went under and over the pressure suit and rotated.

"Hold that," I said.

"Holding."

Three centimeters from her faceplate I still couldn't see through. Maybe the camera could in one frequency or another. I said, "She's likely still got fingerprints, and we'll get her DNA, but not retina prints."

"Yah." The cargo tug backed and began moving away. "Get a view of where it

was lying," Hecate said, but I already was. "Can you get closer? Okay, Gil, move out. You don't have to wait for the tug."

I passed another waldo tug as it was latching on to a canister. A third crawled over the crater rim ahead of me. I followed it over the rim and out.

I said, "I suppose nobody will disturb the scene of the crime? If there's a crime."

"We've got cameras on the waldo tugs. I'll set up a watch."

I watched the tug drag its canister toward the hole in the mound.

In my mind's eye, that hill was an ancient British barrow and all the ancient dead were pouring through the portal in its side, into the living world. But on this dead world what crawled out of the factory was only another set of arms riding tractor treads. Still, it was more deadly than any murderous old king's risen army.

Hecate Bauer-Stanson said, "Soon as we reach civilization, you start a search for missing flatlanders who could have wound up on the moon, and a search for that model pressure suit. We've already ruled out anything manufactured here. It's got to be flatlander."

"Not Belter?"

"The boots, Gil. No magnets. No fittings for magnets."

Well, hell. I'd just lost serious sleuthing points to Lawman Hecate Bauer-Stanson.

"Come on, Gil. We'll let the waldo tug take the body back."

"You can program it?"

"I can get it down from Helios Power One, which is where we're going. It'll be five hours en route. She's waited a long time, Gil; she'll wait a little longer. Come on."

"We taking the Mark Twenty-nine?"

"It could go back by itself ... no. If anything happened ... no, I think we bloody have to."

Hecate directed me: we set the Mark Twenty-nine on a rock ridge. I didn't guess why until she went back to the lemmy for an oxygen tank.

I asked, "Can we spare that?"

"Sure, the whole lunar surface is lousy with bound oxygen. I have to get the dust off, don't I?" She pointed the tank and opened the stopcock. Dust flew from the Mark Twenty-nine, and I stepped back.

"I mean, we wouldn't want to run out of breath."

"I packed plenty." She emptied the tank. Then we lifted the Mark Twenty-nine back into the lemmy's cargo hold. Hecate took us up and away.

How hard would she hit? Isaac Newton had it all worked out. I was trying to remember the equation, but it wouldn't come. Postulate a mass driver on the rim wall. Launch her in lunar gravity, three kilometers to the center. Up at forty-five degrees, down the same way, Sir Isaac had that straight, and land running. Keep running. Switch the oxygen to high and run , run for the far side of the rim, away from the--rap rap rap--mad scientist who

had set her flying. "Gil?" Rap rap rap.

Knuckles on my helmet, an inch from my eye sockets. "Yah?" I opened my eyes.

We were falling toward a hole in the moon, a vast glittering black patch with fine lines of orange and green scrolling across it. As we dropped--as the lemming's thrust pulled me into my couch, creating a sudden scary sense of down--I could make out the shape of a rounded hill with a few tiny windows glittering in the black.

Hecate said, "I thought you might freak if thrust started while you were asleep."

The orange and black logo was upside

down. Helios Power One was sheathed in Black Power. I was amused, but it made sense: If the fusion plant went down, they'd still want lights, cooling, and the air recycler.

"What were you dreaming? Your legs were kicking."

I'd been dozing. What had I been dreaming? "Hecate, she turned the oxygen all the way up. Maybe there was no leak. Maybe it was to run better."

We settled into an orange and green mandala, Helios Power One's landing pad. Hecate eeled out of the cabin, then hustled me out. She said, "We'll see if her suit really has a leak. Anything

else?"

"I was thinking a ship landed in the middle of Del Rey and left her there. A little ship, because you'd want the drive flame splashing into a crater, and those are little craters. Your lemmie could do that, couldn't it? And nothing would show--"

"Don't bet on that. It's always amazing what you can see from orbit. Anyway, I'd hate to ride anything into Del Rey Crater. Gil, I'm feeling a little warm."

"Just your imagination."

"Let's get to decontamination."

Copernicus Dome was three hundred kilometers northeast of Del Rey. Helios Power One was only a hundred, in a different direction, but both would be just a hop in the lemmmy.

Copernicus Dome certainly had medical facilities for rad poisoning. Any autodoc off Earth could treat us for that. Radiation treatment must date back to the end of World War II! Nearly two centuries of improved techniques leave it difficult to die of radiation ... but not impossible.

But decontamination , washing the radiation off something you want to live with afterward, is something else again. Only fission and fusion power plants

would have decontamination facilities.

So far so good. But Helios Power One used He3 fusion.

There's He3 all over the moon, absorbed onto the rocks. The helium-three nucleus includes two protons and a neutron. It fuses nicely with simple deuterium--which has to be imported--giving He4 and hydrogen and energy, but only at ungodly temperatures. The wonderful thing about He3 fusion is that it doesn't spit out neutrons. It's not radioactive.

Why would Helios Power One have decontamination rooms? It was another intelligence test, and I hadn't solved it yet. I could ask Hecate ... eventually.

I have used decontamination procedures to get evidence off a corpse. At Helios Power One they were far more elaborate. There were rad counters everywhere. Still in my suit, I went through a magnetic tunnel, then air jets. I crawled out of my suit directly into a zippered bag. The suit went somewhere else. Instruments sniffed me. Ten showerheads gave me the first decent shower I'd had since leaving Earth.

Then on to a row of six giant coffins. They were Rydeen MedTek autodocs, built long for lunie height, and I wondered: Why so many? They didn't look used. That was a relief. I lay down in the first and went to sleep.

I woke feeling sluggish and blurred.

Two hours had passed. I'd picked up less than two hundred millirem, but a red blinker on the readout was telling me to drink plenty of liquids and be back in the 'doc in twenty hours. I could picture Rydeen MedTek's funny molecules cruising my arteries, picking up stray radioactive particles, running my kidneys and urogenital system up to warp speed, shutting down half-dead cells that might turn cancerous. Clogging my circulation.

I used a phone to track Hecate Bauer-Stanson to the director's office.

She stood and turned as I came in,

graceful as hell. When I try that, my feet always leave the floor. "Nunnally, this is Ubersleuth Gil Hamilton of the Amalgamated Regional Militia on Earth. Gil, Nunnally Sterne's the duty officer."

Sterne was a lunie, long-headed, very dark. When he stood to shake hands, he looked eight feet tall, and maybe he was. "You've done us a great favor, Hamilton," he said. "We didn't like having the waldo tugs shut down. I'm sure Mr. Hodder will want to thank you in person."

"Hodder is--?"

"Everett Hodder is the director. He's home now."

"Is it still nighttime?"

Sterne smiled. "Past noon, officially."

I asked, "Sterne, what do you want with radioactive sludge?"

I'd heard that sigh everywhere on the moon. Flatlander. Talk slow. Sterne said, "This isn't exactly a secret. It just wouldn't exactly be popular. The justification for these generators, on Earth and anywhere else, is that helium-three fusion isn't radioactive."

"Uh huh."

"The flatlanders started lobbing these packages into Del Rey in ... early last

century. They--"

"Boeing Corporation, USA, 2003 a.d.," I said. "Supposed to be 2001, but there was some kind of legal bickering. Makes it easy to remember."

"R-right. They kept it up for nearly fifty years. At the end the targeting was more accurate, and that's when they used the packages to paint that VERBOTEN sign across the crater. You must have--"

"We saw it."

"It could just as easily have been COCA-COLA. Well, deuterium-tritium fusion was better than fission, but it wasn't much cleaner. But when we

finally got the helium-three plants going, it all turned around.

"We ship He3 to Earth by the ton. When we had enough money, we built four He3 plants on the moon, too. Del Rey Crater was out of business. And that held for another fifty years."

"Sure."

"What's finally knocked the bottom out is this new solar electric paint. Black Power, they call it. It turns sunlight into electricity, just like any solar power converter, but you spray it on. Place your cables and then spray over them. All you need is sunlight and room.

"On Earth they're still buying He3, and we can keep that up until your eighteen billion flatlanders start spraying the tops of their heads for power."

"You use it yourselves?"

"Stet. Black Power is a great invention, but it's so cheap that it's no longer feasible for us to build new He3 fusion plants. You see? But running the old ones is still cheaper than the paint."

I nodded. Hecate was pretending she already knew all this.

"So my job is safe. Except that He3 fusion has to be ten times hotter than D-T fusion. The plant is starting to leak heat.

Fusion is running slow. We have to inject a catalyst, something to heat up the He3. Something that fissions or fuses at a lower temperature."

Sterne was enjoying himself. "Wouldn't it be nice if there was something already measured out in standard units and uniform proportions, just lying around ready to pick up--"

"Stet. I see it."

"This radioactive goo from Del Rey Crater works fine. It hasn't lost much of its kick. The processor doesn't do much more than pop off the boosters and lift off the dust."

"How?"

"Magnetically. We had to build an injector system, of course, with a neutron reflector chamber. We had to install these decontamination rooms and the autodocs and a human doctor on permanent call. Nothing is simple. But the canisters--we just pop them in and let them heat up until the stuff sprays out. We've been using them for two years. Eventually the waldo tugs moved enough canisters that we noticed the body. Hamilton, who was she?"

"We'll find out. Sterne, when this leaks out--" I saw his theatrical wince. "Sorry--"

"Don't say leak."

"Nothing gets attention like a murder. Then the media will all be looking at a fusion plant that was supposed to be radiation-free that you guys have got running radioactive. We can keep that half -secret for a day or two while we thrash around and you work on your story. If you'll do the same."

Sterne looked puzzled. "It was all fairly public, but ... yes. Be glad to."

Hecate said, "We need phones."

We bought water bottles from a dispenser wall in the technicians' lounge. The lounge had a recycler booth,

too. Hecate hadn't gotten nearly the dose I had, but we were both taking in water and funny molecules, and we'd be needing the recycler a lot.

There were four phones. We settled ourselves under the eyes of curious techs and turned on privacy dampers. I called the Los Angeles ARM.

A message light was blinking on Hecate's phone. I watched her ignore it while she talked rapid-fire in mime.

I waited.

It always takes forever to connect, and you never learn the problem. No satellite in place? Lightning sends its own

signals? Someone left a switch point turned off? Muslim Sector is tapping ARM communications, badly? Sometimes a local government tries that.

But a perfect multiracial androgynous image was inviting me to speak my needs.

I tapped in Jackson Bera's code. I got Jackson explaining that he wasn't there.

"Got a locked room for you, Jackson," I told the hologram. "See if Garner has an interest. I need an ancient pressure suit identified. We think it was made on Earth. I can't send the suit itself; it's radioactive as hell." I faxed him the videotape I'd taken in Del Rey Crater,

dead woman, footprints, and all.

That should get their attention.

Hecate was still occupied. Given a free moment, I called Taffy in Hovestraydt City. "Hi, love, the lu--"

"I'm off performing surgery," the recording cried wildly. "The villagers say I'm mad, but this day I have created life ! If you want the heeheehee patient to call back, leave your vital stats at the chime."

Bong! I said, "Love, the lunie law has me halfway around the moon looking at something interesting. Sorry about tomorrow. I can't give you a time frame

or a number. If the monster wants a mate, I'll look around."

Hecate had been watching me as she talked. Now she rang off, grinning. "You'll get your view of Del Rey," she told me. "None of the sputniki are handy, but I got a Belt miner to do the job for a break in his customs fee. He'll do a low pass over Del Rey. Forty minutes from now."

"Good."

"And I've got another bugful of men coming here. We can send the Mark Twenty-nine back with one of them. Who was that?"

"My highly significant other."

She lifted an eyebrow. "You have others of lesser significance?"

I lied to keep things simple. "No, we're lockstepped."

"Ah. Next?"

"I sent what we've got on the suit to the ARM. If we're lucky, I'll get Luke Garner's attention. He's old enough to recognize that suit. And your message light's doing back flips."

She tapped acknowledge. A male head and shoulders spoke to her, then fizzed out. Hecate said, "Shreve Development

wants to talk to me. Want in?"

"Is that the guy who loaned us--"

"I expect it's Yonnie's boss." She dialed and got a lunie computer construct who put her straight through.

He was a beanpole lunie, young but balding, his fringe of black hair a tightly coiled ruff. "Lawman Bauer-Stanson? I'm Hector Sanchez. Are you currently in possession of a piece of Shreve Development property?"

Hecate said, "Yes. We arranged the loan through Ms. Kotani, your chief of security, but I'm sure she--"

"Yes, of course, of course. She consulted my office, all most proper, and if I'd been available, I'd have done just what Ms. Kotani--but Mr. Shreve is extremely upset. We'd like the device back at once."

This was starting to feel peculiar. Hecate hesitated, looking at me. I opened the conference line and said, "Shall we decontaminate the device first?"

Faced by two talking heads, he became flustered. "Decontaminate? For what?"

"I'm not at liberty--I'm Gil Hamilton, by the way, with the ARM. Happened to be available. I'm not at liberty to discuss

details, but let's say that there was a spacecraft involved, and citizens of Earth, and--" I let a stutter develop. "I-if we hadn't had the, the device , it would have been an impossible situation. Impossible. But some r-radioactive material got tracked inside the S-shreveshield-- Is that how you pronounce it?"

"Yes, perfect."

"So we need to know, Mr. Sanchez. We sprayed any dust off with an oxygen tank, but n- now what? Shall we run it through decontamination at Helios Power One? Or just return it as is? For that matter, may we turn it off? Or are there neutrons trapped in that field just waiting to be

sprayed everywhere?"

Sanchez took a moment to collect himself. Thinking hard. Mr. Shreve--what would he want? It seemed their experiment had been used to clean up after a spacecraft accident involving celebrity flatlanders! Just as well that it was being hushed up. Witnesses might still remember a two-wheeled thing moving safely through radioactive debris. Meanwhile this ARM, this flatlander seemed scared spitless by the Mark Twenty-nine.

Ultimately Shreve Development would want the tale told. What they didn't want was noses poking into their experimental

shield generator for details of construction.

Hector Sanchez said, "Turn it off. That's quite safe. We'll do our own decontamination."

"Police lemmmy okay?"

"I ... don't think so. We'll send a vehicle. Where are you?"

Hecate took over. "We'll bring it to Helios Power One. We're a bit busy now, so give us two or three hours to get it there."

She clicked off and looked at me. " May we turn it off?"

"Playing dumb."

"Convincing. The accent helps. Gil, what's on your mind?"

"Standard practice. Hold something back. It lets a perp display guilty knowledge."

"Uh huh. You may find that's harder on the moon. There aren't so many of us, and communications are sacred. You can be dead a thousand ways because someone didn't speak, or didn't listen, or couldn't. But be that as it may, what's on your mind? Is this another talent?"

"Hunch, Hecate. Something funny's going on. Sanchez doesn't seem to know what

it is. He's just worried. But this Mr. Shreve must be the Shreveshield Shreve, the inventor himself, the way Sanchez is acting. What does he want?"

"He's supposed to be retired, Gil. But if there was a radioactive spill somewhere--"

"That's what I mean. Something radioactive, he'd want the Mark Twenty-nine, but he'd want it right now . He doesn't. He'd want it where the spill happened, but no, he doesn't. He'll come get it at Helios Power One. Maybe it's more a matter of where he doesn't want the Mark Twenty-nine."

She mulled it over. "Suppose his man

gets here and the Mark Twenty-nine hasn't arrived yet?"

I liked it. "Somebody might get upset."

"I'll fix it. Next?"

I stretched. "It'll be a while before we have anything to look at. Let's see if there's a commissary."

"You scout out dinner," she said. "I'll make their widget vanish, and then I want to check on the corpse."

There was no commissary and no restaurant, either. There was a coin-operated dispenser wall in the lounge. I glanced into the greenhouse: dead of

night.

So we bought handmeals from the dispenser and took them into the greenhouse.

An artificial full Earth glowed overhead. The stars weren't flaming, but something about them ... ah. They were color-coded. Deep red for Mars, brighter red for Aldebaran, violet for Sirius ...

Lunies try to turn their greenhouses into gardens, and there are always individual touches. There were fruits and vegetables to be picked as dark surprises from a hill sculpted into a shadowy sitting Buddha.

Hecate reported, "The body is en route. John Ling got us two waldo tugs. The second one is keeping the first in view. That way there's a camera watching the corpse at all times." She stopped to spit cherry seeds. "Good man. And Nunnally Sterne says he's set aside one of the handling rooms for an autopsy. We'll do it through leaded glass, with waldos."

I was carving a pear the size of a melon, partly by feel. "What do you think we'll find?"

"What am I offered?"

"Well, radiation, of course, or a leak. No gunshot or stab wounds or concussions--I'd have found that."

"Psi powers are notoriously undependable," she said.

I didn't take offense, because of course she was right. I said, "I can generally count on mine. They've saved my life more than once. They're just limited."

"Tell me."

So I told her a story, and we ate the pear and the handmeals, and a quiet descended.

Taffy and I aren't exactly lockstepped. But Taffy and I and Harry McCavity, her lunie surgeon, and Laura Drury, my lunie cop, are lockstepped, and Taffy and I are affianced to become pregnant someday. I

used to like a complicated love life, but I've started to lose that. So the dark and quiet companionship began to feel ominous, and I said, just to be saying something, "She could have been poisoned."

Hecate laughed.

I persisted. "What if you murder someone, then freeze-dry her, then toss her three kilometers in lunar gravity? You don't expect anyone'll find her, not in Del Rey, but if someone did--"

"Tossed how? A little portable mass driver on the rim?"

"Damn."

"Would you have found bruising?"

"Maybe."

"And then she made the footprints?"

Double damn. "If we had specs on our mass driver, we'd know how accurate it was. Maybe the footprints were already there and the killer just fired the body at where they ended. Then again, there aren't any portable mass drivers."

Hecate was laughing. "All right, who made the footprints?"

"Your turn."

"She walked in," Hecate said. "Trick

was to erase any footprints that led in from the rim."

"Blast from an oxygen tank?"

"A lemming doesn't carry that much oxygen. A serious spacecraft would. A spacecraft could just spray the whole area with the rocket motor, but ... Gil, a ship could just land in the crater, push her out, and take off. You said so yourself."

I nodded. "That's starting to look like it. Besides, why would anyone walk into Del Rey Crater?"

"What if the killer persuaded her she was wearing a rad-shielded suit?"

Riiight. Still too many possibilities.
"What if there was something valuable hidden in there? A bank heist. A dime disk with ARM secret weapons on it."

"A secret map of the vaults under the Face on Mars."

"Down comes a lemming to pick it up. Back goes a lemming with the copilot left behind."

"How long ago? If it was forty or fifty years, say, your lemming wouldn't even have a Shredshield. It'd be a suicide mission."

Which narrowed the window a little.
Hmm ...

"I never tried lockstepped," Hecate Bauer-Stanson said.

"Well, it's easier with four. And we're constantly being moved around, so getting together is a hobby in itself."

"Four?"

I stood. "Hecate, I need the recycler again."

"And I've probably got message lights."

The phones were signaling messages for both of us. Hecate punched hers up while I used the recycler. When I came out, she was beckoning frantically. I moved to her shoulder.

"This is Lawman Bauer-Stanson," she said.

The construct said, "Please hold for Maxim Shreve."

Maxim Shreve was seated in a diagnostic chair, a reclining traveler with an extended neck rest for his greater length. Old and sick, I judged, holding himself together by little more than will. "Lawman Bauer-Stanson, we need the Mark Twenty-nine back at once. My associates tell me that, it has not reached Helios Power One."

"Haven't they--? Will you hold while I try to find out?" Hecate punched hold and glared at me. "The Mark Twenty-

nine's under a tarp with dirt on it. We can't uncover it because Hector Sanchez has landed a cargo shell in plain view of it. What do I say now ?"

I said, "It isn't loaded yet. Your man has a lemmy flying around the site looking for more casualties. Tell him that, but don't admit there's been a crash."

She mulled it over for a moment, then put Shreve back on.

The old man was standing, dark and skeletally gaunt: Baron Samedi. Travel chair or no, in lunar gravity he could loom . The instant Hecate appeared, he was raging.

"Lawman Bauer-Stanson, Shreve Development has never been in trouble with the law. We're not only a good corporate citizen, we're one of Luna City's major sources of income! Ms. Kotani cooperated with your office when you expressed a need. I presume that need is over. What must I do to get the Mark Twenty-nine back quickly?"

I'd figured that out, but it wasn't a thing to be broadcast.

Hecate said, "Sir, the device hasn't even been loaded yet. My man on the spot is still searching for casualties, but her police vehicle is too big to get inside the, uh--" Hecate allowed herself a bit of agitation. "--site. Sir, lives may depend

on your device. Are lives at stake at your end?"

Shreve seemed to have recovered his aplomb. He floated back into his chair. "Lawman, the device is experimental . We've never put any test subject in an experimental Shreveshield without medical monitors, and I include whole herds of minipigs! What if the field hiccoughed with your man in it? Is she even a lunie citizen? Is her suit equipped with medical ports?"

"Yes, I see. I'll call Lawman Cervantes."

"Wait, Lawman. Did it work?"

Hecate frowned.

"Did the shield perform as it should? Is everyone all right? No radiation?"

Hecate said, "The, um, user tracked some radioactive material into the shield, but that certainly wasn't the Shreveshield's fault. It worked fine, far as we can tell."

Maxim Shreve's eyes rolled up in his head, and all his pain wrinkles smoothed out. In that instant it was as if his life had been vindicated. Then he remembered us.

"I wish you could tell me more of the circumstances," he said briskly. "We will certainly want recordings if our device resolved a calamity." Without

frying anyone!

"We'll have the device back in your hands within hours, and of course we're very grateful," Hecate said. "I expect we'll be able to tell you the complete story within the week, but even then it may be confidential for a time."

"That's all right, then. Good-bye, Lawman, ah, Bauer-Stanson." He was gone.

She didn't turn. "Now what?"

I said, "Tell your men to get the pilot inside."

"Pilots. Sanchez and a new voice heard

from. Better if you invite them in, O Prince from a Foreign Land."

"All right."

"Cameras on their vehicle," she said.

"Um ... stet. Hecate, what have you got to work with?"

"Six of my police. They've been setting up to examine the body. Two Helios personnel. They cooperated when we buried the Mark Twenty-nine, so they'll cooperate when we uncover it. Two police lemmies--"

"Stet. Here's what we do. One lemmie takes off out of sight. Then the other

hovers while the first one lands. We only want the dust cloud and a fast shuffle of police lemmies while your men uncover the Mark Twenty-nine."

"This had better be worth the hassle." She got up and reached past me to connect my phone to the lunie cops outside. "Wylie, ARM Ubersleuth Hamilton wants to talk to your visitors. Then get back to me."

I waited.

Sanchez and a woman with short crisp blond hair fitted their heads into camera view. Bubble helmets still reflect light and hide a jawline. Sanchez said, "We came for the Mark Twenty-nine,

Hamilton."

The woman edged him out. "Hamilton? I'm Geraldine Randall. We were told we could pick up the Shreveshield here. I hope it hasn't got itself lost."

Randall was in charge, very much so. I said, "No, no, not at all, but things are a bit complicated at present. Come in and wait, won't you."

"I'll be right in," Randall said with a glowing smile.

She was going to leave Sanchez to watch the damn cargo shell. "Both of you, please," I added. "You may have to sit in. I don't know what authority I have

here. Probably whatever nobody else wants." Just a touch of bitterness showing.

She frowned, nodded.

I switched off. Hecate was still miming. My own message light was blinking, but I waited. Presently Hecate sat back and blew hair out of her eyes.

I said, "Sanity check. When you gave him details, Shreve calmed down . Yes?"

She thought about it. "I guess he did."

"Uh huh. But you didn't tell him anything reassuring. Device hasn't been loaded

for return? It's sitting around the site of a disaster? Involving spacecraft and extralunar celebrities? Waiting for someone to use it? Again? "

Hecate said, "Maybe his med-chair doped him to stop a stroke. No, dammit, he was lucid . And who the hell is Geraldine Randall?"

"Bauer-Stanson? Hamilton? I'm Geraldine Randall." We stood, and my feet left the floor, and Randall reached up to shake hands with Hecate and down to shake hands with me. She was six feet five and lush, with short curls of buttery blond hair, full lips, and a wide smile. A short lunie in her forties, I judged her, carrying enough weight to round her out.

"What news?"

"Cervantes says it's on the way," Hecate said. "Knowing Cervantes, it could mean he's almost ready to launch."

Sanchez looked miserable. Randall was losing her smile. "Hamilton, I hope you're using the device only for the purpose intended. Max Shreve is seriously worried about security."

I said, "Randall, I was pulled out of bed because there was flatlander politics involved, and I'm an ARM with the rank of Ubersleuth. If somebody's been high-handed, he'll have two governments on his tail, not just Shreve, Inc."

"Persuasive," she said.

"Ms. Randall, it's all being recorded. Think of the movie rights!"

"Not persuasive. We may not hold those. The disaster didn't take place on our turf. Hamilton, we want the device back."

"Are you with Shreve Inc. or the government?"

"Shreve," she said.

"In what capacity?"

"I'm on the board."

She didn't look that old. "For how long?"

"I was one of the original six."

"Six?"

Hecate was offering coffee. Randall took one and added sugar and cream. She said, "Thirty-five years ago Max Shreve came to five of us with the designs for an active shield against radiation. Everything he told us proved out. He made us rich. There's not a lot I wouldn't do for Max Shreve."

"He sent you? He wants it back that urgently?"

She ran a long-fingered hand through her short curls. "Max doesn't know I came, but he seemed very upset on the phone. I

don't see it as that urgent myself, but I'm starting to wonder. How many lunie police have left eye tracks and fingerprints on the Mark Twenty- nine? And what do I have to do to get it back?"

Message light for Hecate. She picked up. I said, "It's probably incoming now. Randall, I suppose I'll sound naive, but I can't believe you're old enough--"

She laughed. "I was twenty-six. I'm sixty-one now. Lunar gravity is kind to human bodies."

"Would you try the same gamble again?"

She thought it over. "Maybe. I'm not sure a con man could have put together as

good a package as Max had. He was a lunie; we could track him. He did very well at Luna City University. He could talk fast, too. Kandry Li wanted to go for a smaller version of the shield, and we watched Max talk her out of it. He made diagrams, charts, models, all on the spot. He played Kandry's own computer like a pipe organ. I think I could do his damn lecture myself."

"Do it."

She stared at me.

"I was just a kid when the Shreveshield came out. I wanted one just big enough for me. Why can't I have it?"

She laughed, trailed off. "Well. It doesn't scale up. You need a bigger template to retain the hysteresis effect that traps the neutrons. Otherwise the shield effect just fades out on you. That's what the--" She caught herself.

"Right," I said.

Hecate Bauer-Stanson flicked off her privacy. "It's down," she said. "You can collect it any time. Shall I give you some men to load it?"

"I'd be most grateful," Randall said to Hecate. She didn't have to tell Sanchez to see to it, because he was already leaving. To me she said, "We had to reconfigure the circuitry pattern. It's not

the same fractal on the Mark Twenty-nine; it's not even related. Well, thank you both," and she was gone, too.

"Gil, you've got a message light."

Hecate watched over my shoulder as I played the message from the Los Angeles ARM. Split field, a computer composite of the dead woman's suit manifested next to Luke Garner in a travel chair.

Luke at 188 was paraplegic, had been for years, but he looked healthier than Maxim Shreve. Happier, too. He spoke rituals of courtesy, then, "We think your suit was customized from one of the pressure suits that came up with the first

moon colony. Thing is, those suits were returned to NASA for study. Your deader really did get it from Earth. It's ninety to a hundred years old.

"So right now you're probably wondering, Why didn't she just buy a new pressure suit?' And the answer might be these ." Luke's cursor highlighted points on the old suit. "Medical sensors. Those early suits didn't just keep an astronaut alive. NASA wanted to know what was happening to them. If they died, maybe the next one wouldn't.

"In the early space program the medical probes were invasive. You wince just reading about it. These later suits

weren't so bad, but your deader may have upgraded them anyway. What she wanted was the medical ports on the suit. There are suits like that still being made, of course, but they're expensive and the sale would be remembered. Take your choice; she was secretive or cheap.

"Let me know, will you? And remember, criminals don't like locked rooms. They're usually accidents."

I watched the empty space where Luke had been. "Hecate, didn't Shreve say that Shreve Development labs have pressure suits with medical ports? We might've guessed that--"

"I bet they're a lot less than a hundred years old, Gil. You want to see them anyway? I'll arrange that."

Four off-duty technicians had been watching our antics. Now they seemed to be losing interest. I didn't blame them. I got up and paced for a bit, wondering if there was anything more I could do.

Hecate said, "I've got your overhead view, Gil."

"Put it on."

A camera was panning slowly across a shrinking moonscape tinted with violet from the fusion drive of a rising Belt trading ship. Del Rey Crater slid into

view, shrinking. Little craters all the same size. Bits of silver in the little craters. Three bronze bugs ... four crawling around near the southern rim. We watched until Del Rey was sliding off the edge of the field, shrunk too small to show detail.

Then Hecate replayed it, slowing it, slower yet. "See it?"

It's amazing what you can see from orbit.

Waldo tugs had made random tracks all across the southern quarter of Del Rey, like the tunnels in an ant farm. Down there they had obscured the flow lines. But from up here ...

Something on the southern rim had sandblasted Del Rey Crater from the rim as far as the battered central peak.

Down there would be surfaces clean of dust, sharp crater rims slightly rounded, microraters erased. Down there you would see only details. Close up I had seen nothing of the overall fan-shaped pattern.

I didn't believe that had been done by a spacecraft's oxygen tanks. It was too intense. That smooth wash must have been made by the rocket motor itself.

"The footprints must have been made afterward," I speculated. "Anything earlier was washed out. I'm going to

have to apologize to Luke."

"No. He called it," Hecate said. "Nobody sets out to make a locked room mystery. The perp was hiding something else. Now, he fired from the south rim? And prints made afterward lead from the center south-southeast. She ran toward the killer?"

"Right toward her only source of escape. And oxygen. And medical help."

"She was hoping for mercy," Hecate said.

I looked over at her. Hecate didn't seem unduly disturbed, only bemused. Whoever had set a woman down in that

radioactive hell would not offer mercy.

I said, "She might have begged. Who knows? I know people who would have been gasping curses. She might run to the center to leave a message, then run away from it to distract the killer."

"Did you see a message?"

"No. I wasn't even sure I liked the notion. "That rocket flame had to be erasing something . It looks like the killer didn't have the guts to go into the crater, but propping his lemming right on the rim took some nerve. Why? To erase footprints?"

"Gil, only a madman would trudge out

into the middle of Del Rey Crater unless he already knew something was there." She caught my smile. "Like you did. But someone might peek over an edge. The perp erased the bootprints that led in from the edge. The ones in the center, he left."

"Could have waited and got them all. And any later message."

"Your turn," she said.

The last time I had read a murdered man's dying message, he'd been lying. But at least Chris Penzler hadn't erased it and then made me guess what it said!

"I need a nap," I said. "Give me a call

when you know something."

It felt like I'd been asleep for some time. I was on the rug, totally comfortable in lunar gravity. I had a view of Lawman Hecate Bauer-Stanson's back. She was studying a diffuse rainbow glow. I couldn't see the hologram from down here.

I got to my feet.

Hecate had a split screen going. Through one holo window they were carving a woman like a statue of petrified wood. The band saw was running itself. I could see vague human shapes out of focus behind a wall of thick glass.

One of the slices was passing through a second window. The view would zoom in on some detail: arteries and sections through the liver and ribs. Details might fluoresce before the view backed off.

A third window showed the archaic suit.

"The damn trouble," I said, talking to myself because Hecate had her privacy on, "is that there's nobody to pull in. No witnesses, no suspects ... millions of suspects. With a proper leak in her suit she could have died yesterday. With no leak she could have been out there ten years. More."

What if her suit was new when she lay down?

No. Even sixty years ago the missiles were still falling in Del Rey Crater. "From ten to sixty years. Even on the moon that's a million suspects, and nobody has an alibi to cover a fifty-year span."

A fourth window blinked on, showing a fingerprint--another--something unidentified-- "Retina," Hecate said without turning. "Completely degraded. But I got fingerprints and partial DNA. Maybe the ARM can match them."

I said, "Boot them over to me."

She did. I called the Los Angeles ARM. I left a message on Bera's personal code, then got through to a duty clerk. He

showed signs of interest when he realized I was calling from the moon. I gave him the dead woman to track down.

Hecate was looking at me when I clicked off. I said, "There are short lunies."

She said, "Bet?"

"What odds?"

She considered, and my phone blinked. I picked it up.

Valerie Van Scopp Rhine. Height: 1.66 meters. Born 2038 A.D., Winnetka, North America. Mass: 62 kg. Gene type ... allergies ... medical ... She was forty

or so when the picture was taken, a lovely woman with high cheekbones and a delicately shaped skull under a golden crest of hair. No children. Single. Full partner, Gabriel's Shield, Inc., 2083 2091 A.D. No felony convictions. WANTED on suspicion of 28.81, 9.00, 9.20--

Hecate was reading over my shoulder.

I said, "The codes mean she's wanted on suspicion of embezzlement, flight to escape arrest, violation of political boundaries, misuse of vital resources, and some other stuff as of thirty-six years ago."

"Interesting. Vital resources?"

"It used to be the custom; you named every possible crime and then trimmed. Boundaries- -that's an old law. Here it means they think she escaped to space."

"Interesting. Gil, her suit isn't leaking."

"Isn't it?"

"There was a fair vacuum inside. We got traces of organics, of course, but it would have taken years--decades to lose all of her air and water."

I said, "Thirty-six years."

"All that time. In Del Rey Crater?"

"Hecate, at a distance her suit looked

just like another of the Boeing packages, and nobody was looking, anyway."

"Then we can guess why the body's in such good shape. Radiation," Hecate said. "What's she supposed to have embezzled?"

I scrolled through the file. "Looks like funds from Gabriel's Shield. And Gabriel's Shield turns out to be a research group ... Two partners: Valerie Van Scopp Rhine and Maxim Yeltzin Shreve."

"Shreve."

"Bankrupt in A.D. 2091, when Rhine allegedly disappeared with the funds." I

stood up. "Hecate, I've got to go sharpen my skates. You can study this, or you can summon up a dossier on Maxim Shreve."

She stared, then laughed. "I thought I'd heard every possible way to say that. Go. Then drink some more water."

I waited for a woman to step out of the recycler booth, then went in.

Hecate had a display up when I got back.

Maxim Yeltzin Shreve. Height: 2.23 meters. Born 2044 A.D. Outer Soviet, Moon. Mass: 101 kg. Gene type ... allergies ... medical ... No felony convictions. Married Juliana Mary Krupp 2061, divorced 2080. Children:

none. Single. A videoflat of his graduation, looking like a burly soccer champ, used with permission. A holo taken at the launch of the fourth slowboat, the colony ship bound for Tau Ceti, bearing the larger model Shreveshield, in a.d. 2122. He didn't need a medical chair then, but he didn't look good. Chairman of the board of Shreve Development 2091, retired November 2125. Two years ago.

When your body gets sick enough, your mind starts to go, too. I could be putting too much weight on any oddities in this man's behavior.

I hit the key that got me the next dossier.

Geraldine Randall. Height: 2.08 meters. Born 2066 A.D., Clavius, Moon. Mass: 89 kg. Gene type ... allergies ... medical ... She'd had a problem carrying a child, corrected by surgery. No felony convictions. Married Charles Hastings Chan 2080. Children: 1 girl, Marya Jenna. She'd been at the launch of the fourth slowboat, too. Member of the board of Shreve Development 2091.

Over Hecate's shoulder they were still carving the dead woman. I understood why they were so casual about it. The remains of lunar dead become mulch, whatever can't be used as transplants. Hecate was listening to a running commentary, but if they'd found evidence

of disease, she'd have told me.

Valerie Rhine hadn't rotted because radiation had fried all the bacteria in her body. She could have lasted a million years, a billion, without my hindrance.

I turned back to Maxim Shreve as he had been when he had registered as Shreve Development, a lunar corporation, thirty-six years ago. He was posing with five others, and one was Geraldine Randall. A younger man, he already looked sick ... or just worn down, working himself to death. It's one way to get rich. Give everything to your dream. Six years later, A.D. 2097 and looking a little better, he and his partners had an active shield up for patent.

Did lunies just get old quicker? I tapped Hecate's shoulder. She turned off privacy, and I asked, "How old are you, Hecate?"

"I'm forty-two."

She met my stare. Older than me by one year and healthy as a gymnast. The lunie doctor Taffy saw when I wasn't around is in his sixties. I said, "Shreve must be sick. He's less than ninety. What's his problem?"

"Doesn't it say?"

"I couldn't find it."

She slid into my spot and began diddling with the virtual keys. "The file's been edited. Citizens don't have to tell all their embarrassing secrets, Gil, but ... he must be crazy. What if he needed medical help and it wasn't in the records?"

"Crazy or guilty."

"You think he's hiding something?"

I said, "Call him."

"Now, Gil. Maxim Shreve is one of the most powerful men on the moon, and I wasn't thinking of changing careers." She studied me, worried. "Are you just harrassing the man in the hope he'll tell

us something?"

I said, "It seems pretty clear what happened, doesn't it?"

"You're thinking he killed her and took the money himself. Set down in Del Rey and pushed her out of the ship, still alive. But why not kill her first? Then there wouldn't be any footprints or dying messages."

"Nope, you've only got half of it."

She flapped her arms in exasperation.
"Go for it."

"First: Mark Twenty-nine. You said Shreve Development has been trying to

build a little shield ever since they got the big ones. I believe it. Twenty-nine is a big number. Maybe a small version is the first thing he tried. That's what told him about the, what she said, hysteresis problem.

"Second: He didn't act like a thief running away with the money. When he founded Shreve Inc., he acted like a man who wants to build something and almost knows how. I think he and Rhine spent all they had on experiments.

"Third: Someone sprayed part of the crater from the rim, and I think that was Shreve. There's no sign he was in the crater except for Rhine's footprints, and we already know something was erased.

"Fourth: Why Del Rey Crater? Why walk around in the most radioactive crater on the moon?"

Hecate was looking blank. I said, "They were testing a prototype Shreveshield. That's why she walked in. I even know what he was hiding when he sprayed the crater."

She said, "I'll call him. Your theory; you talk."

Hecate looked around at me. "Mr. Shreve isn't taking calls. It says he's in physical therapy."

I asked, "Where's the Mark Twenty-nine

now?"

"They took off almost an hour ago." It took her only a few seconds. "En route to Copernicus. That's the Shreve Inc. labs. ETA ten minutes."

"Good enough. Luke Garner's travel chair has a sender in it in case he needs a serious autodoc or even a doctor. What do you think? Would a lunie's chair have one, too?"

It took her longer (I got her coffee and a handmeal) to work her way through the lunar medical network. Finally she sighed and looked up and said, "He's in motion. Moving toward Del Rey Crater. I have a number for the phone in his

chair, Gil."

"Futz! Always I get it almost right."

"Call him?"

"I'm inclined to wait for him to touch down."

She studied me. "He's going after the body?"

"Seems right. Any bets on what he might do with it?"

"It's a big moon." She turned back. "He's crossing Del Rey. Slowing. Gil, he's going down."

"Phone him."

His phone must have been buzzing during the landing. When he answered, it was by voice, no picture. "What?"

I said, "The thing about poetic justice is that it requires a poet. I'm Ubersleuth Gil Hamilton, with the ARM, Mr. Shreve. On the moon by coincidence."

"I'm a lunie citizen, Hamilton."

"Valerie Rhine was of Earth."

"Hamilton, I'm supposed to run now. Let me set my headphones and get on the track."

I laughed. "You do that. Shall I tell you a story?"

I heard irregular puffing, less like a sick man running on an exercise track in low gravity than like the same man climbing out of a spacecraft. No sound of fiddling with headphones: they'd be already in place inside his bubble helmet.

Fair's fair. I said, "I'm perched on the rim of Del Rey Crater, safely protected by my Shreveshield, vidding you through a telescopic lens."

Hecate covered her face, muffling laughter.

"I don't have time for this," Shreve said.

"Sure you do. With the radiation you'll be facing in the next few minutes, you're already dead. That is, if you intend to go somewhere with a body. Do you have a portable Shreveshield? A Mark Twenty-eight or Twenty-seven? An experiment that almost worked? I admit I thought you'd wait for the Twenty-nine."

The puffing continued.

"If you checked out an early experimental Shreveshield, we can track that. They were handy before you retired, but now you'd have to go through someone and get some men to load it, too."

Puffing. Regular exercise: a man on a

track or the same man pulling a heavy cart across a bumpy craterscape. He was going to bluff it out.

"Retiring took you out of the system, Shreve. You weren't on top of things when Helios Power One started sending waldo tugs into Del Rey, and when Lawman Bauer-Stanson asked your Ms. Kotani if she could borrow your new prototype, you didn't know it for hours."

He said, "Where is she?"

Hecate spoke. "We've already dissected it, Mr. Shreve."

The puffing became much faster.

I said, "Shreve, I know you're not afraid of the organ banks. The hospitals wouldn't take anything you've got. Come in and tell your story."

"No. But I'll--tell you a story, Ubersleuth. Lawman."

"It's about two brilliant experimenters. One didn't have any money sense, so the other had to keep track of expenses when he'd rather have been working on the project. We were in love, but we were in love with an idea, too."

His breathing had become easier. "We developed the theory together. I understood the theory, but the prototypes kept burning out and blowing up. And

every time something happened, Valerie knew exactly what went wrong and how to fix it. Warble the power source. More precision in the circuitry. I couldn't keep up. All I knew was that we were running out of money.

"Then one day we had it. It worked. She swore it worked. We already had all the instruments we needed. I spent our last few marks on videotape. Camera. Stacks of batteries. The--we called it the Maxival Shield--it ate power like there was no tomorrow.

"We went out to Del Rey Crater. Valerie's idea. Test the device and film the tests. Anyone who saw Valerie dance around in Del Rey Crater would

throw funding at us with both hands."

"Gil, he's taking off."

Too fast. I suddenly realized why his breathing had eased. He'd left his Mark Twenty-odd sitting in the dust. Maybe it had quit working; maybe he had stopped caring.

I asked, "Shreve, what went wrong?"

"She went out into Del Rey with the prototype. Just walking, turning to cross in front of the camera, then some gymnastics, staying within the shield effect, and all with that glow around her and her face shining in the bubble helmet. She was beautiful. Then she

looked at the instruments and started screaming. I could see it on my own dials; the field was just gradually dying out.

"She was screaming, Oh, my God, the shield's breaking down!" And she started running. I think I can get to the rim. Call Copernicus General Hospital.'

"Running with the shield? Wasn't it too heavy?"

"How did you know that? "

Hecate said, "Gil, he's just cruising along the crater rim. Hovering."

I nodded to her. I told Shreve, "That was

our biggest problem. What were you erasing when you sprayed rocket flame across the crater? I figure your shield generator was big. You had it on some sort of cart that Rhine could pull. She pulled a superconducting cable. She left her power source with you."

"That's right, and then she ran away and left it. If a hospital got her, every cop on the moon would want to look into our alleged radiation shield. The doctors would have to know exactly what she was exposed to. We didn't have a tenthmark left. Nobody would believe we had anything, what with Valerie glowing in the dark, and if anyone did, he could get the designs on the four

o'clock news."

"So you pulled it back."

"Hand over hand. Was I supposed to leave it sitting out on the moon? But she saw me doing it. She--I don't know what she was thinking--she ran away, toward the center of the crater. I'd already had more radiation than I wanted, but those tracks ... not just the footprints but--"

"The tracks of the cable," I said. "All over the dust like a rattlesnake convention."

"Anyone could see them just by looking over the rim! So I moved the lemmy up onto the crater wall and turned it on its

side and used the rocket. I don't know what Valerie was thinking by then. Did she write some kind of last message?"

Hecate said, "No."

"Even if she did, who would see it? But I picked up too much radiation. It's nearly killed me."

"Well, it kind of did," I said. "Rad sickness retired you early. It was part of what tipped me off."

"Hamilton, where are you?"

"Wait, Hecate! Shreve, it wouldn't be prudent to answer."

Hecate said edgily, "Gil, he's accelerating straight up. What was that all about?"

"Last gestures. Right, Shreve?"

"Right," he said, and turned off his phone.

I told Hecate, "When his Mark Twenty-odd shut down, he had nothing left. He went looking for me. Spray my ship with rocket flame. I lied about being on the rim of Del Rey, but we don't know what he's flying, Hecate, and I don't want him to know where we are. Even a lemming could do severe damage if you dropped it on Helios Power One at maximum thrust. What's he doing now?"

"Coasting. I think ... I think he's out of fuel. He burned up a lot, hovering."

"We should keep watching."

Two hours later Hecate said, "His travel chair just quit sending."

"Where did he come down?"

"Del Rey, near the center. I want to look at it before I assume anything."

"It could have been very messy. He was a hero, after all." I yawned and stretched. I could be back in Hovestraydt City by tomorrow morning.

AFTERWORD: SCIENCE/MYSTERY FICTION

I have always gotten too involved with my characters.

I certainly did while finishing "Death by Ecstasy."

Even now, I don't generally write of purely black-hearted villains. Loren the organlegger was my first. I finished the first draft of that story at six o'clock one

morning ... went to bed ... stared at the ceiling ... gave up at about ten and went looking for company. I finished rewriting that scene a week or two later, at six in the morning. I gave up trying to sleep at around eight. Stopping Loren's heart with my imaginary hand was a rough experience. It may not shake you, but it shook me.

That was the first of the tales of Gil Hamilton of the Amalgamated Regional Militia, the police force of the United Nations. The second story bubbled in my head for a long time before I wrote down anything but notes.

Bouchercon is a gathering of mystery fans held annually in memory of Anthony

Boucher, for many years the editor of Ellery Queen's Mystery Magazine and of Fantasy and Science Fiction , and the author of the classic "Nine-Finger Jack." At the first Bouchercon, I already had in mind a most unusual crime with a most unusual motive. I outlined that crime to an audience during a panel discussion. "Death by Ecstasy" just sort of grew, but "The Defenseless Dead" was meticulously plotted in advance, and it didn't hit me nearly as hard. Maybe it should have. The story and the assumptions behind it are terrifying, and uncomfortably real.

Gil the Arm is one of my favorite characters. Riiight. Thirty years of

writing, and still there are only these five stories! If I like him so freezing much, why not write more stories?

Because following two sets of rules is hard work, that's why.

A detective story is a puzzle. In principle the reader can know what crime was committed, by whom, and how and where and why, before the story hits him in the face with it. He must have enough data to make this obviously true, and there must be only one answer possible.

Science fiction is an exercise in imagination. The more interesting an idea, the less justification it needs. A

science-fiction story will be judged on its internal consistency and the reach of the author's imagination. Strange backgrounds, odd societies following odd laws, and unfamiliar values and ways of thinking are the rule. Alfred Bester overdid it, but see his classic *The Demolished Man* .

Now, how can the reader anticipate the detective if all the rules are strange?

If science fiction recognizes no limits, then ... maybe the victim was death-wished from outside a locked room, or stabbed through a keyhole by a psychic killer who ESPed where he was standing. Walls may be transparent to a laser outside the visible band. Perhaps

the alien killer's motive really is beyond comprehension. Can the reader really rule out time travel? Invisible killers? Some new device tinkered together by a homicidal genius?

More to the point, how can I give you a fair puzzle?

With great difficulty, that's how. There's nothing impossible about it. You can trust John Dickson Carr, and me, not to bring a secret passageway into a locked-room mystery. If there's an X-ray laser involved, I'll show it to you. If I haven't shown you an invisible man, there isn't one. If the ethics of Belt and lunie societies are important, I'll go into detail

on the subject.

Detective and science fiction (and fantasy and police procedurals) do have a lot in common. Internal consistency. Readers. All these genres attract readers who like a challenge, a puzzle. Whether it's the odd disappearance of a weapon (a glass dagger hidden in a flower vase full of water) or the incomprehensibly violent behavior of a visiting alien (he needs a rest room, bad), the question is, What's going on? The reader is entitled to his chance to out- think the author.

Much detective fiction, and most science fiction, is also sociological fiction. See Asimov's *The Caves of Steel* and *The Naked Sun* , and Brunner's *Puzzle* on

Tantalus . Bester's The Demolished Man is that, and is also an involuted psychological study, a subject well suited to its society of telepaths. Psychological studies are common in crime fiction, too. So are puzzles in basic science, like Asimov's Wendell Urth stories. Garrett's Lord Darcy operates in the world of working magic, but the stories are puzzles in internal consistency. Ellery Queen would feel at home with them.

Mystery/sf needed defending once upon a time, back when Hal Clement took up John W. Campbell's challenge (Needle , with an intelligent parasite/symbiote as detective), but you're not really in doubt,

are you? We could shape a sizable library from detective science fiction. Needle is half a century old, and there are older yet if we include Poe's "The Murders in the Rue Morgue." (His murderous ape was more fiction than animal research). Detectives seem to live beyond their stories: Asimov's Dr. Wendell Urth and Lije Bailey, Randall Garrett's Lord Darcy (fantasy/detective fiction!), and scores of pastiches (particularly stories by Poul Anderson and Gene Wolfe) in which Sherlock Holmes's niche is taken by aliens, mutants, downloads, artificial intelligences, or robots.

In the mixed marriage of mystery and

science fiction there are pitfalls. A 1950s novel of matter duplicators, *Double Jeopardy*, suffered from internal inconsistency: a coin reversed except for the lettering, a crucial error in multiplication. Edward Hoch writes good tight puzzles, but his near-future mystery *The Transvection Machine* twisted human nature far beyond credibility, merely to make a tighter puzzle.

And me?

I was working on "ARM," which becomes the third story in this volume, before I ever sold a story. Frederick Pohl (*Galaxy*) turned down that primitive version. So did John W.

Campbell (Analog). What came of that was two letters telling me why mystery/sf is so difficult to write, and what was wrong with "ARM" in particular.

"ARM" needed help. There were too many characters. There were holes in the science, the sociology, the logic. The puzzle grew far too complex.

So I put it away until I could learn more about my craft.

Most of my stories are puzzle stories. Naturally a lot of them become crime and detective stories.

"The Hole Man" involves murder

committed with a weapon no normal jury could be expected to understand. "The Meddler" showed a Mike Hammer clone trying to operate with an alien sociologist at his elbow. "The Tale of the Genie and the Sisters" showed Scheherazade in a detective role. "All the Myriad Ways" was a crime story about quantum mechanics. "The Deadlier Weapon" and "\$16,940.00" are straight crime stories.

These aside, I generally write more than one story within any imaginary world. It isn't laziness. Honest! It's just that, having designed a detailed, believable, even probable future, I often find that I have more to say about it than will fit in

a story.

So it comes about that Gil the ARM lives and works in the 2120s of the "known space" line of history, whose story bulks at a million words as of this writing, including stories by other authors (within the Man-Kzin Wars volumes) and a half-written novel, *The Ringworld Throne* . Most of these novels and short stories take place in human space, thirty light-years across, but lines of development include the Ringworld (200 light-years galactic north) and the galactic core (33,000 light-years toward Sagitarius.) For crime stories set later in "known space," see the Beowulf Shaeffer stories in

Crashlander .

Five sociological stories that are also crime stories took place along another timeline, the world of JumpShift, Inc., and "Flash Crowd." The assumption is that teleportation was perfected in the 1980s, and by the 1990s a network of instant-transportation booths has spread across the world. Alibis disappear, and a new kind of killer appears. He's the guy who would otherwise have moved away by now. Instead he finds himself living next door (effectively) to his boss and his business rival and his ex-spouse and the guy who has owed him thirty bucks for six years and denies it. Where can he go? So he kills.

Footfall , written with Jerry Pournelle, includes a murder puzzle among the alien invaders of Earth, though the Herdmaster's Advisor isn't even dead until a hundred thousand words into the book. By then you should know the fithp well enough to guess who, and how, and why.

Ten years after my first try, with several crime/sf stories in print, I was ready to have another look at "ARM."

"ARM" looked bad. I had to rewrite from scratch. I saved what I could: some nice descriptions, including the surreal murder scene, a couple of characters, and the strongest bones in the plot skeleton. I took out some verbal

thrashing about in bizarre restaurants. Gil the ARM replaced Lucas Garner onstage. I took out an irrelevant nightmare, and a coin-operated surgeon device capable of implanting the bud of a new organ: wrong era, and it made things too easy for the killer. I took out the FyreStop device, which killed by suppressing chemical reactions: a fun thing, but unnecessary, and it complicated the bejeesus out of the plot. Losing that cost me three or four suspects, and good riddance.

(But look for excellent handling of the FyreStop idea in The D.A.G.G.E.R. Affair , an old Man from U.N.C.L.E. story by David McDaniel.)

When I showed the result to Jerry Pournelle, he made me rewrite it. He also showed me where the organleggers came in.

In general, then, I corrected the flaws John Campbell and Frederick Pohl had pointed out. I wish Campbell had lived to see "ARM."

How likely is Gil Hamilton's future?

I don't see how we can avoid the crowding or the rigid, dictatorial population control without the blessing of a major war or plague. As for the conquest of the solar system, one can hope. And as for the UN organ banks ...

One of my oldest stories, "The Jigsaw Man" laid out the basis of the organ bank problem. If Jeffrey Dahmer had been executed in a hospital, disassembled like a jigsaw puzzle, he could have saved as many lives as he took. So can any adult who has committed a capital crime. Or any child whose crime is deemed to be adultlike ... and hey, kids are committing a lot of murders these days, and wouldn't you rather have a fifteen-year-old's organs than an elderly Charles Manson's? If that approach still leaves the Red Cross needing whole blood and patients crying for eyes and kidneys, then Rush Limbaugh and John Bobbitt are constantly violating principles of political correctness. And what about

the guy who thinks he can ruin a wetlands just because he paid for the land?

Where do we stop?

Ever since publication of "The Jigsaw Man," letters have been flowing in. They come with clippings and photocopies of newspapers stories. An army of readers (the Reluctant Donor Irregulars?) seems ready to alert me to developments regarding transplants and organ banks.

One tells of an interschool debating competition. The question: Shall condemned criminals be executed by dismantling, the parts to be reserved for organ transplants? The reader who

informed me was horrified: the majority voted yes.

You can watch the future fanning out in three directions. Transplanted organs succeed more often and the patients live longer, but prosthetic devices seem to be improving even faster. You don't need a knee transplant; the artificial version is better. Your artificial heart could survive you.

The third choice isn't generating news, but it's important. Clone and grow your own replacement organs! Rejection wouldn't be a problem. You would have to grow what you need before it's urgent, and if you didn't prepare ... then your need for a new liver is no act of God,

but your own damned fault. Now whom shall we break up?

One evening last month, I got a phone call from George Scithers. He followed up with newspaper clippings. India has been disassembling condemned criminals for transplants since 1964.

The practice is informal. Donor has been condemned to death. Method: bullet in the neck. Afterward the doctors can have him. But the executioner shoots badly, so the organs are taken while Donor still lives.

Transplants are usually rejected because the Indian doctors don't bother much with matching types. But, by God, they're

fresh. And you can't blame Larry Niven for pointing out the possibilities.

They're doing it in China, too. A photocopied page in my mail tells me how to get a brochure on the subject from Human Rights Watch, Publicity Department. "Discusses evidence demonstrating that China's heavy reliance on executed prisoners as a source of transplant organs entails a wide range of human rights and medical ethics violations."

Organlegging in our own cities is today's news: unwilling donors found bleeding in the streets, kidneys and hearts missing.

Meanwhile, Bill Rotsler's quadruple-bypass operation moved veins from his legs into his heart. No rejection problem. My own knee is healing nicely from an operation that didn't involve scalpels, just a laser to burn out a torn meniscus. The woman undergoing physical therapy on the stationary bike next to me is doing fine as her flesh heals around a fully artificial knee. Stay tuned. We're shaping the future now.