

Lucifer's Hammer



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Larry Niven and Jerry Pournelle

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**To Neil Armstrong and Buzz Aldrin,
the first men to walk on another world;**

to Michael Collins, who waited;

**and to those who died trying,
Gus Grissom, Roger Chaffee,
Ed White, Georgi Dobrovolsky,
Viktor Patsayev, Nikolai Volkov,**

and all the others.

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DRAMATIS PERSONAE

TIMOTHY HAMNER, amateur astronomer
ARTHUR CLAY JELLISON, United States Senator from California
MAUREEN JELLISON, his daughter
HARVEY RANDALL, Producer-Director for NBS Television
MRS. LORETTA STEWART RANDALL
BARRY PRICE, Supervising Engineer, San Joaquin Nuclear Project
DOLORES MUNSON, Executive Secretary to Barry Price
EILEEN SUSAN HANCOCK, Assistant Manager for Corrigan's Plumbing
Supplies of Burbank
LEONILLA ALEXANDROVNA MALIK, M.D., physician and kosmonaut
MARK CZESCU, biker
GORDON VANCE, Bank President and neighbor to Harvey Randall
ANDY RANDALL, Harvey Randall's son
CHARLIE BASCOMB, cameraman
MANUEL ARGUILEZ, sound technician
DR. CHARLES SHARPS, Planetary Scientist and Project Director, California
Institute of Technology's Jet Propulsion Laboratories
PENELOPE JOYCE WILSON, fashion designer
FRED LAUREN, convicted sex offender
COL. JOHN BAKER, USAF, astronaut
HARRY NEWCOMBE, letter carrier, US Postal Service
THE REVEREND HENRY ARMITAGE
DR. DAN FORRESTER, Member of technical staff, JPL
LT. COL. RICK DELANTY, USAF, astronaut
MRS. GLORIA DELANTY
BRIGADIER PIETER JAKOV, kosmonaut
FRANK STONER, biker
JOANNA MACPHERSON, Mark Czescu's roommate
COLLEEN DARCY, bank teller
GENERAL THOMAS BAMBRIDGE, USAF, Commander in Chief, Strategic
Air Command
JOHN KIM, Press Secretary to the Mayor Of Los Angeles
THE HONORABLE BENTLEY ALLEN, Mayor of Los Angeles
ERIC LARSEN, Patrolman, Burbank PD
JOE HARRIS, Investigator, Burbank PD
COMET WARDENS, a Southern California religious group
MAJOR BENNET ROSTEN, USAF, Minuteman Squadron Commander
MRS. MARIE VANCE, wife of Gordon Vance

HARRY STIMMS, automobile dealer in Tujunga, California

CORPORAL ROGER GILLINGS, Army

SERGEANT THOMAS HOOKER, Army

MARTY ROBBINS, Tim Hamner's assistant and caretaker

JASON GILLCUDDY, writer

HUGO BECK, owner of a commune in the foothills of the High Sierra

Prologue

Before the sun burned, before the planets formed, there were chaos and the comets.

Chaos was a local thickening in the interstellar medium. Its mass was great enough to attract itself, to hold itself, and it thickened further. Eddies formed. Particles of dust and frozen gas drifted together, and touched, and clung. Flakes formed, and then loose snowballs of frozen gases. Over the ages a whirlpool pattern developed, a fifth of a light-year across. The center contracted further. Local eddies, whirling frantically near the center of the storm, collapsed to form planets.

It formed as a cloud of snow, far from the whirlpool's axis. Ices joined the swarm, but slowly, slowly, a few molecules at a time. Methane, ammonia, carbon dioxide; and sometimes denser objects struck it and embedded themselves, so that it held rocks, and iron. Now it was a single stable mass. Other ices formed, chemicals that could only be stable in the interstellar cold.

It was four miles across when the disaster came.

The end was sudden. In no more than fifty years, the wink of an eye in its lifetime, the whirlpool's center collapsed. A new sun burned fearfully bright.

Myriads of comets flashed to vapor in that hellish flame. Planets lost their atmospheres. A great wind of light pressure stripped all the loose gas and dust from the inner system and hurled it at the stars.

It hardly noticed. It was two hundred times as far from the sun as the newly formed planet Neptune. The new sun was no more than an uncommonly bright star, gradually dimming now.

Down in the maelstrom there was frantic activity. Gases boiled out of the rocks of the inner system. Complex chemicals developed in the seas of the third planet. Endless hurricanes boiled across and within the gas-giant worlds. The inner worlds would never know calm.

The only real calm was at the edge of interstellar space, in the halo, where millions of thinly spread comets, each as far from its nearest brother as Earth is from Mars, cruise forever through the cold black vacuum. Here its endless quiet sleep could last for billions of years . . . but not forever. Nothing lasts forever.

PART 1

THE ANVIL

Against boredom, even the gods themselves struggle in vain.

Nietzsche

January: The Portent

*The bay-trees in our country are all wither'd
-And meteors fright the fixed stars of heaven;
The pale-faced moon looks bloody on the earth
And lean-look'd prophets whisper fearful change.
These signs forerun the death or fall of kings.*

William Shakespeare, *Richard II*

The blue Mercedes turned into the big circular drive of the Beverly Hills mansion at precisely five after six. Julia Sutter was understandably startled. "Good God, George, it's Tim! And dead on time."

George Sutter joined her at the window. That was Tim's car, yup. He grunted and turned back to the bar. His wife's parties were always important events, so why, after weeks of careful engineering and orchestration, was she terrified that no one would show up? The psychosis was so common there ought to be a name for it.

Tim Hamner, though, and on time. That was strange. Tim's money was third-generation. Old money, by Los Angeles standards, and Tim had a lot of it. He only came to parties when he wanted to.

The Sutters' architect had been in love with concrete. There were square walls and square angles for the house, and softly curving free-form pools in the gardens outside; not unusual for Beverly Hills, but startling to easterners. To their right was a traditional Monterey villa of white stucco and red tile roofs, to the left a Norman chateau magically transplanted to California. The Sutter place was set well back from the street so that it seemed divorced from the tall palms the city fathers had decreed for this part of Beverly Hills. A great loop of drive ran up to the house itself. On the porch stood eight parking attendants, agile young men in red jackets.

Hamner left the motor running and got out of the car. The "key left" reminder screamed at him. Ordinarily Tim would have snarled a powerful curse upon Ralph Nader's hemorrhoids, but tonight he never noticed. His eyes were dreamy; his hand patted at his coat pocket, then stole inside. The parking attendant hesitated. People didn't usually tip until they were leaving. Hamner kept walking, dreamy-eyed, and the attendant drove away.

Hamner glanced back at the red-coated young men, wondering if one or another might be interested in astronomy. They were almost always from UCLA or Loyola University. Could be . . . Reluctantly he decided against it and went inside, his hand straying from time to time to feel the telegram crackle under his fingers.

The big double doors opened onto an enormous area that extended right through the house. Large arches, rimmed by red brick, separated the entry from the living areas: a mere suggestion of walls between rooms. The floor was continuous throughout: brown tile laid with bright mosaic patterns. Of the two hundred and more guests expected, fewer than a dozen were clustered near the bar. Their talk was bright

and cheery, louder than necessary. They looked isolated in all that empty space, all that expanse of tables with candles and patterned tablecloths. There were nearly as many uniformed attendants as guests. Hamner noticed none of this. He'd grown up with it.

Julia Sutter broke from the tiny group of guests and hurried to meet him. There was a tight look around her eyes: Her face had been lifted, and was younger than her hands. She made a kissing motion a fraction of an inch from Tim's cheek and said, "Timmy, I'm glad to see you!" Then she noticed his radiant smile.

She drew back a little and her eyes narrowed. The note of mock concern in her voice covered real worry. "My God, Timmy! What have you been smoking?"

Tim Hamner was tall and bony, with just a touch of paunch to break the smooth lines. His long face was built for melancholy. His mother's family had owned a highly successful cemetery-mortuary, and it showed. Tonight, though, his face was cracked wide apart in a blazing smile, and there was a strange light in his eyes. He said, "The Hamner-Brown Comet!"

"Oh!" Julia stared. "What?" That didn't make sense. You don't smoke a comet. She tried to puzzle it out while her eyes roved to her husband—was he having a second drink already?—to the door—when were the others coming? The invitations had been explicit. The important guests were coming early—weren't they?—and couldn't stay late, and—

She heard the low purr of a big car outside, and through the narrow windows framing the door saw half a dozen people spilling out of a dark limousine. Tim would have to take care of himself. She patted his arm and said, "That's nice, Timmy. Excuse me, please?" A hasty intimate smile and she was gone.

If it bothered Hamner it didn't show. He ambled toward the bar. Behind him Julia went to welcome her most important guest, Senator Jellison, with his entourage. He always brought everyone, administrative assistants as well as family. Tim Hamner's smile was blazing when he reached the bar.

"Good evening, Mr. Hamner."

"Good it is. Tonight I'm walking on pink clouds. Congratulate me, Rodrigo, they're going to name a comet after me!"

Michael Rodriguez, laying out glasses behind the bar, missed a beat. "A comet?"

"Right. Hamner-Brown Comet. It's coming, Rodrigo, you can see it, oh, around June, give or take a few weeks." Hamner took out the telegram and opened it with a snap.

"We will not see it from Los Angeles," Rodriguez laughed. "What may I serve you tonight?"

"Scotch rocks. You *could* see it. It could be as big as Halley's Comet." Hamner took the drink and looked about. There was a group around George Sutter. The knot of people drew Tim like a magnet. He clutched the telegram in one hand and his drink in another, as Julia brought the new guests over and introduced them.

Senator Arthur Clay Jellison was built something like a brick, muscular rather than overweight. He was bulky, jovial and blessed with thick white hair. He was photogenic as hell, and half the people in the country would have recognized him. His voice sounded exactly as it did on TV: resonant, enveloping, so that everything he said took on a mysterious importance.

Maureen Jellison, the Senator's daughter, had long, dark red hair and pale clear skin and a beauty that would have made Tim Hamner shy on any other night; but when Julia Sutter turned to him and (finally!) said, "What was that about a—"

"Hamner-Brown Comet" Tim waved the telegram. "Kitt Peak Observatory had confirmed my sighting! It's a real comet, it's *my* comet, they're naming it after me!"

Maureen Jellison's eyebrows went up slightly. George Sutter drained his glass before asking the obvious question. "Who's Brown?"

Hamner shrugged; his untasted drink slopped a little onto the carpet, and Julia frowned. "Nobody's ever heard of him," Tim said. "But the International Astronomical Union says it was a simultaneous sighting."

"So what you own is half a comet," said George Sutter.

Tim laughed, quite genuinely. "The day you own half a comet, George, I'll buy all those bonds you keep trying to sell me. And buy your drinks all night." He downed his scotch rocks in two swallows.

When he looked up he'd lost his audience. George was headed back to the bar. Julia had Senator Jellison's arm and was steering him toward new arrivals. The Senator's administrative assistants followed in her wake.

"Half a comet is quite a lot," Maureen said. Tim Hamner turned to find her still there. "Tell me, how do you see anything through the smog?"

She sounded interested. She looked interested. And she could have gone with her father. The scotch was a warm trace in his throat and stomach. Tim began telling her about his mountain observatory, not too many miles past Mount Wilson but far enough into the Angeles Mountains that the lights from Pasadena didn't ruin the seeing. He kept food supplies there, and an assistant, and he'd spent months of nights watching the sky, tracking known asteroids and the outer moons, letting his eye and brain learn the territory, and forever watching for the dot of light that shouldn't be there, the anomaly that would . . .

Maureen Jellison had a familiar glazed look in her eyes. He asked, "Hey, am I boring you?"

She was instantly apologetic. "No, I'm sorry, it was just a stray thought."

"I know I sometimes get carried away."

She smiled and shook her head; a wealth of deep red hair rippled and danced. "No, really. Dad's on the Finance Subcommittee for Science and Astronautics. He loves pure science, and I caught the bug from him. I was just. . . You're a man who knows what he wants, and you've found it. Not many can say that." She was suddenly very serious.

Tim laughed, embarrassed; he was only just getting used to the fact. "What can I do for an encore?"

"Yes, exactly. What do you do when you've walked on the moon, and then they cancel the space program?"

"Why . . . I don't know. I've heard they sometimes have troubles. . . ."

"Don't worry about it," Maureen said. "You're on the moon now. Enjoy it."

* * *

The hot dry wind known as the Santa Ana blew across the Los Angeles hills,

clearing the city of smog. Lights glittered and danced in the early darkness. Harvey Randall, his wife, Loretta, beside him, drove his green Toronado with the windows open, relishing the summer weather in January. When they arrived at the Sutter place he turned the car over to the red-jacketed attendant, and paused while Loretta adjusted her smile before moving through the big front doors.

They found the usual mob scene for a Beverly Hills party. A hundred people were scattered among the little tables, and another hundred in clumps; a mariachi group in one corner played gay background music and the singer, deprived of his microphone, was still doing pretty well telling everyone about the state of his *Corazon*. They greeted their hostess and parted: Loretta found a conversation, and Harvey located the bar by searching out the thickest cluster of people. He collected two gin and tonics.

Bits of conversation ricocheted around him. "We didn't let him on the white rug, you see. So the dog had the cat 'treed' in the middle of the rug and was pacing sentry duty around the perimeter . . ."

". . . was this beautiful young chick one seat ahead of me on the plane. A real knockout, even if all I could see was her hair and the back of her head. I was thinking of a way to meet her when she looked back and said, 'Uncle Pete! What are you doing here?' "

". . . man, it's helped a lot! When I call and say it's *Commissioner* Robbins, I get right through. Haven't had a customer miss a good option since the Mayor appointed me."

They stuck in his mind, these bits and pieces of story. For Harvey Randall it was an occupational hazard of the TV documentary business; he couldn't help listening. He didn't want to, really. People fascinated him. He would have liked to follow up some of these glimpses into other minds.

He looked around for Loretta, but she was too short to stand out in this crowd. Instead he picked out high-piled hair of unconvincing orange-red: Brenda Tey, who'd been talking to Loretta before Harvey went to the bar. He made for that point, easing past shoals of elbows attached to drinks.

"Twenty billion bucks, and all we got was rocks! Those damn big rockets, billions of dollars dropped into the drink. Why spend all that money out there when we could be—"

"Bullshit," said Harvey.

George Sutter turned in surprise. "Oh. Hello, Harv . . . It'll be the same with the Shuttle. Just the same. It's all money thrown down the drain—"

"That turns out not to be the case." The voice was clear, sweet and penetrating. It cut right through George's manifesto, and it couldn't be ignored. George stopped in midsentence.

Harvey found a spectacular redhead in a green one-shoulder party gown. Her eyes met his when he looked at her, and he looked away first. He smiled and said, "Is that the same as bullshit?"

"Yes. But more tactful." She grinned at him, and Harvey let his own smile stay in place instead of fading away. She turned to the attack. "Mr. Sutter, NASA didn't spend the Apollo money on hardware. We bought research on how to build the hardware, and we've still got it. Knowledge can't go into the drink. As for the Shuttle, that's the price

to get out there where we can really learn things, and not much of a price at that . . ."

A woman's breast and shoulder rubbed playfully against Harvey's arm. That had to be Loretta, and it was. He handed her her drink. His own was half gone. When Loretta started to speak he gestured her silent, a little more rudely than he usually did, and ignored her look of protest.

The redhead knew her stuff. If careful reason and logic could win arguments, she won. But she had a lot more: She had every male's eye, and a slow southern drawl that made every word count, and a voice so pure and musical that any interruption seemed stuttered or mumbled.

The unequal contest ended when George discovered that his drink was empty and, with visible relief, broke for the bar.

Smiling triumph, the girl turned toward Harvey, and he nodded his congratulations.

"I'm Harvey Randall. My wife, Loretta."

"Maureen Jellison. Most pleased." She frowned for half a second. "I remember now. You were the last U.S. newsman in Cambodia." She shook hands, formally, with Harvey and Loretta. "And wasn't your newscopter shot down over there?"

"Twice," Loretta said proudly. "Harvey brought his Air Force pilot out. Fifty miles of enemy lines."

Maureen nodded gravely. She was fifteen years younger than the Randalls, and seemed very self-possessed. "So now you're here. Are you natives?"

"I am," Harvey said. "Loretta's from Detroit—"

"Grosse Pointe," Loretta said automatically.

"—but I was born in L.A." Harvey could never quite bring himself to tell Loretta's half-truth for her. "We're scarce, we natives."

"And what do they have you doing now?" Maureen asked.

"Documentaries. News features, mostly," Harvey said.

"I know who you are," Loretta said in some awe. "I just met your father. Senator Jellison."

"That's right." Maureen looked thoughtful, then grinned broadly. "Say, if you do news features there's somebody you ought to meet. Tim Hamner."

Harvey frowned. The name seemed familiar, but he couldn't place it. "Why?"

Loretta said, "Hamner? A young man with a frightening grin?" She giggled. "He's a teensy bit drunk. He wouldn't let anyone else talk. At all. He owns half a comet."

"That's him," Maureen said. Her smile made Loretta feel part of a conspiracy.

"He also owns a lot of soap," Harvey said.

It was Maureen's turn to look blank.

"I just remembered," Harvey said. "He inherited the Kalva Soap Company."

"May be, but he's prouder of the comet," Maureen said. "I don't blame him. Dear old Dad could have been President once, but he's never come close to discovering a comet." She scanned the room until she spotted her target. "The tall man in the suit with white and maroon in it. You'll know him by his smile. Get anywhere near him and he'll tell you all about it."

Harvey felt Loretta tugging at his arm, and reluctantly looked away from

Maureen. When he looked back someone else had snared her. He went to fetch another pair of drinks.

* * *

As always, Harvey Randall drank too much and wondered why he came to these parties. But he knew; Loretta saw them as a way to participate in his life. She didn't enjoy his field trips. The one attempt to take her on a hike with their son had been a disaster. When she went with him on location she wanted to stay in the best hotels, and if she dutifully came to the small bars and gathering places Harvey preferred, it was obvious that she was working hard to hide her unhappiness.

But she was very much at home at parties like this one, and tonight's had been especially good. She even managed a private conversation with Senator Jellison. Harvey left her with the Senator and went to find more drinks. "Light on the gin, Rodriguez. Please."

The bartender smiled and mixed the drink without comment. Harvey stood with it. Tim Hamner was alone at one of the little tables. He was looking at Harvey, but the eyes were dreamy; they saw nothing. And that smile. Harvey made his way across the room and dropped into the other chair at the table. "Mr. Hamner? Harvey Randall. Maureen Jellison said I should say 'Comet.' "

Hamner's face came alight. The grin broadened, if that were possible. He took a telegram out of his pocket and waved it. "Right! The sighting was confirmed this afternoon. Hamner-Brown Comet."

"You skipped a step."

"She didn't tell you *anything*? Well! I'm Tim Hamner. Astronomer. Well, not professional, but my equipment's professional. And I work at it—anyway. I'm an amateur astronomer. A week ago I found a smear of light not far from Neptune. A dim smear. It didn't belong there. I kept looking at it, and it moved. I studied it long enough to be sure, and then I reported it. It's a new comet. Kitt Peak just confirmed it. The IAU is naming it after me—and Brown."

For just that moment, envy flashed through Harvey Randall like a lightning strike. It was gone as quickly; he made it go, shoving it into the bottom of his mind where he could pull it up and look at it later. He was ashamed of it. But without that flash he would have asked a more tactful first question. "Who's Brown?"

Hamner's face didn't change. "Gavin Brown is a kid in Centerville, Iowa. Ground his own mirror to build his telescope. He reported the comet at the same time I did. The IAU rules it a simultaneous sighting. If I hadn't waited to be certain . . ." Hamner shrugged and continued, "I called Brown this afternoon. Sent him a plane ticket, because I want to meet him. He didn't even want to come until I promised to show him around the solar observatory at Mount Wilson. That's all he really cares about! Sunspots! He found the comet by accident!"

"When will we see this comet? That is," Harvey backtracked, "will it be visible at all?"

"Much too early to ask. Wait a month. Watch the news."

"I'm not supposed to watch the news. I'm supposed to report the news," said Harvey. "And this could be news. Tell me more."

Hamner was eager to do that. He rattled on, while Harvey nodded with a

broadening grin. Beautiful! You didn't have to know what all the words meant to know the equipment was expensive, and probably photogenic to boot. Expensive and elaborate equipment, and the kid with a bent pin for a hook and a willow stick for a rod had caught just as big a fish as the millionaire!

Millionaire. "Mr. Hamner, if this comet turns out to be worth a documentary—"

"Well, it might. And the discovery would be. How amateur astronomers can be important . . ."

Hooked, by God! "What I was going to ask was, if we can make a documentary on the comet, would Kalva Soap be interested in sponsoring it?"

The change in Hamner was subtle, but it was there. Harvey instantly revised his opinion of the man. Hamner had a lot of experience with people after his money. He was an enthusiast, but hardly a fool.

"Tell me, Mr. Randall, didn't you do that thing on the Alaskan glacier?"

"Harvey. Yes."

"It stunk."

"Sure did," Harvey agreed. "The sponsor insisted on control. And got it. And used it. I didn't inherit control of a big company." And to hell with you, too, Mr. Timothy Comet Hamner.

"But I did. And this would be worth doing. You did the Hell's Gate Dam story too, didn't you?"

"Yes."

"I liked that one."

"So did I."

"Good." Hamner nodded several times. "Look, this could be worth sponsoring. Even if the comet never becomes visible, and I think it will. Lord knows they spend enough of the advertising budget sponsoring crap that nobody wants to watch. Might as well tell a story worth telling. Harvey, you need a refill."

They went to the bar. The party was thinning out fast. The Jellisons were just leaving, but Loretta had found another conversation. Harvey recognized a city councilman who'd been after Harvey's station to do a show on a park that was his current goal. He probably thought Loretta would influence Harvey—which was correct—and that Harvey had influence over what the network and its Los Angeles station did— which was a laugh.

Rodriguez was busy for the moment and they stood at the bar. "There's all kinds of excellent new equipment for studying comets," Hamner said. "Including a big orbital telescope only used once, for Kahoutek. Scientists all over the world will want to know how comets differ, how Kahoutek was different from Hamner-Brown. Lot of scientists right here. Cal Tech, and the planetary astronomers at JPL. They'll all want to know more about Hamner-Brown."

Hamner-Brown resonated in his mouth, and Tim Hamner obviously loved the taste. "You see, comets aren't just something pretty up in the sky. They're left over from the big gas cloud that formed the solar system. If we could really learn something about comets—maybe send up a space probe— we'd know more about what the original cloud of gas and dust was like before it fell in on itself and made the Sun and

the planets and moons and things like that."

"You're sober," Harvey said in wonder.

Hamner was startled. Then he laughed. "I meant to get drunk just to celebrate, but I guess I've been talking instead of drinking." Rodriguez came over and put drinks in front of them. Hamner lifted his scotch rocks in a salute.

"The way your eyes glow," Harvey said, "I thought you must be drunk. But what you say makes a lot of sense. I doubt we could get a space probe launched, but what the hell, we could try. Only you're talking about more than a single documentary for something like that. Listen, is there a chance? I mean, could we send a probe *into* the comet? Because I know some people in the aerospace industry, and . . ."

And, thought Harvey, that *would* be a story. Who can I get for editor? he wondered. And Charlie Bascomb's available to do camera . . .

"Jellison, too," Hamner said. "He'd be for it. But look, Harv, I know a lot about comets, but not *that* much. It's all guesswork right now. Be a few months before Hamner-Brown gets to perihelion." He added quickly, "Closest point to the Sun. Which isn't the same as the closest point to the Earth. . . .?"

"How close will that be?" Harvey asked.

Hamner shrugged. "Haven't analyzed the orbit yet. Maybe close. Anyway, Hamner-Brown will be moving *fast* when it rounds the Sun. It will have fallen all the way from the halo, out there beyond Pluto, a *long* way. You understand, I won't really be computing the orbit. I'll have to wait for the professionals, just like you."

Harvey nodded. They lifted their glasses and drank.

"But I like the idea," Hamner said. "There's going to be a lot of *scientific* pressure for studies of Hamner-Brown, and it wouldn't hurt to push the idea with the general public. I like it."

"Of course," Harvey said carefully, "I'd have to have a firm commitment on sponsorship before I could do much work on this. Are you sure Kalva Soap would be interested? The show might pull a good audience—but it might not."

Hamner nodded. "Kahoutek," he said. "They were burned on that one before. Nobody wants to be disappointed again."

"Yeah."

"So you can count on Kalva Soap. Let's get across why it's important to study comets even if you can't see them. Because I can promise the sponsorship, but I can't promise the comet will deliver. It might not be visible at all. Don't tell people anything more than that."

"I have a reputation for getting my facts straight."

"When your sponsor doesn't interfere," Hamner said.

"Even then, *I* have my facts straight."

"Good. But right now there aren't any facts. Hamner-Brown is pretty big. It has to be, or I couldn't have seen it out that far. And it looks to get pretty close to the Sun. It has a chance of being spectacular, but really, it's impossible to tell. The tail could stretch way-y-y out, or it could just blow away. It depends on the comet."

"Yeah. Look," Harvey said, "can you name one newsman who lost his reputation because of Kahoutek?" He nodded at the puzzled look that got. "Right. None. No

chance. The public blamed the astronomers for blowing it all out of proportion. Nobody blamed the news people."

"Why should they? You were quoting the astronomers."

"Half the time," Harvey agreed. "But we quoted the ones who said exciting things. Two interviews. One man says Kahoutek is going to be the Big Christmas Comet. Another says, well, it's going to be a comet, but you might not see it without field glasses. Guess which tape gets shown on the six o'clock news?"

Hamner laughed. He was draining his glass when Julia Sutter came over.

"Busy, Tim?" she asked, but didn't wait for an answer. "Your cousin Barry is making a fool of himself out in the kitchen. Can you get him to go home?" She spoke low and urgently.

Harvey hated her. *Was* Hamner sober? Would he remember any of this in the morning? Damn.

"Be right with you, Julia," Hamner said. He broke free and made his way back to Harvey. "Just remember, our series on Hamner-Brown is going to be honest. Even if it costs ratings. Kalva Soap can afford it. When do you want to start?"

Maybe there was some justice in the world after all. "Right away, Tim. I want some footage of you and Gavin Brown up at Mount Wilson. And his comments when you show him your setup."

Hamner grinned. He liked that. "Right. Call you tomorrow."

* * *

Loretta slept quietly in the other bed.

Harvey had been staring at the ceiling long enough. He knew this feeling. He would have to get up.

He got up. He made cocoa in a big mug and carried it into his study. Kipling greeted him with tail-thumping joy, and he rubbed the German shepherd's ears absently as he opened the drapes. Los Angeles was semidark below. The Santa Ana had blown away the smog. Freeways were rivers of moving light even at this late hour. Other major streets were marked by a grid of lights whose yellow-orange brilliance Harvey noticed for the first time. Hamner had said they played hell with the seeing at Mount Wilson Observatory.

The city stretched away endlessly. High-rise apartments in shadowed darkness. Blue squares of still-lit swimming pools. Cars. Bright flashing light winking at intervals, the police helicopter on patrol. He left the window and went to the desk, picked up a book, set it down; scratched the dog's ears once more; and very gently, because he didn't trust himself to move rapidly, put the cocoa on the desk.

He'd never had any trouble getting to sleep in the mountains on camping trips. He'd get into his sleeping bag just after dark and sleep all night. It was only in the city that he had insomnia. For years he'd tried to fight it by lying rigid on his back. These nights he got up and stayed up until he was sleepy. Only he didn't usually have trouble on Wednesdays.

Wednesdays, he and Loretta made love.

He'd tried to fight that habit once, but that was years ago; and yes, Loretta would come to his bed on a Monday night; but not always, and never in the afternoon when it

was light; and it was never as good on a Tuesday or a Saturday because on Wednesdays they knew it was coming, they were *ready*. By now the habit had set like concrete.

He shook away those thoughts and concentrated on his good fortune. Hamner had meant it. The documentary would be made. He thought about problems. They'd need an expert on low-light photography; probably time-lapse for the comet itself. This would be fun. Have to thank Maureen Jellison for putting me onto Hamner, he thought. Nice girl. Vivid. More real than most of the women I meet. Too bad Loretta was standing right there . . .

He submerged that thought so quickly that he was barely aware of it. It was a habit he'd developed long ago. He knew too many men who talked themselves into hating their wives when they didn't really dislike them at all. The grass *wasn't* always greener on the other side of the fence; a lesson that he'd learned from his father and never forgotten. His father had been an architect and builder, always close to the Hollywood set but never quite catching the big contracts that would make him rich; but he'd gone to plenty of Hollywood parties.

He'd also had time to take Harvey up into the mountains, and on those long camping hikes he would tell Harvey about producers and stars and writers who spent more than they earned and built themselves images that could never be satisfied. "Can't be happy," Bert Randall would say. "Keep thinking somebody else's wife is better in bed, or just prettier at parties, and talk to themselves enough that they believe it. This whole damn town's got itself believing its own press agents, and nobody can live up to those dreams."

And it was all true. Dreams could be dangerous. Better to concentrate on what you had. And, Harvey thought, I have a lot. A good job, a big house, a swimming pool . . .

None of it paid for, and you can't do what you want on the job, a malicious voice said inside his head.

Harvey ignored it.

* * *

The comets were not alone in the halo.

Local eddies near the center of the maelstrom—that whirling pool of gas which finally collapsed to form the Sun—had condensed into planets. The furious heat of the newly formed star had stripped the gas envelopes from the nearest, leaving nuggets of molten rock and iron. Worlds further out had remained as great balls of gas which men would, in a billion years, name for their gods. There had also been eddies very distant from the whirlpool's axis.

One had formed a planet the size of Saturn, and it was still gathering mass. Its rings were broad and beautiful in starlight. Its surface churned with storms, for its center was furiously hot with the energy of its collapse. Its enormous orbit was tilted almost vertically to the plane of the inner system, and its stately path through the cometary halo took hundreds of thousands of years to complete.

Sometimes a comet would stray too near the black giant and be swept into its ring, or into the thousands of miles of atmosphere. Sometimes that tremendous mass would pluck a comet from its orbit and swing it out into interstellar space, to be lost

forever. And sometimes the black planet would send a comet plunging into the maelstrom and hellfire of the inner system.

They moved in slow, stable orbits, these myriads of comets that had survived the ignition of the Sun. But when the black giant passed, orbits became chaos. Comets that fell into the maelstrom might return partially vaporized, and fall back, again and again, until nothing was left but a cloud of stones. But many never returned at all.

January: Interlude

Be the First in Your Block to Help Blow Out the Electric Power Network of the Northeast.

East Village Other is proud to announce the first annual blackout of the Werewolves which is fixed for 3 P.M. on Wednesday, August 19, 1970. Once more let me put the system to the test. Switch on all the electric equipment you can lay hands on. Help the companies producing and distributing electric power to improve their balance sheets by consuming as much as you can; and even then find some way of using a bit more. In particular, switch on electric heaters, toasters, air conditioning, and any other apparatus with a high consumption. Refrigerators turned up to the maximum, with their doors left open, can cool down a large apartment in an amusing way. After an afternoon's consumption-spree we will meet in Central Park to bay at the moon.

TUNE IN! PLUG IN! BLOW OUT

Hospitals and other emergency services are hereby warned, and invited to take necessary precautions.

*The East Village Other (an underground paper)
July 1970*

On a clear day the view stretched out forever. From his vantage point on the top floor of the San Joaquin Nuclear Project, Site Supervisor Barry Price had an excellent view of the vast lozenge-shaped saucer that had once been an inland sea, and was now the center of California's agricultural industry. The San Joaquin Valley ran two hundred miles to his north, fifty to the south. The uncompleted nuclear-power complex stood on a low ridge twenty feet above the totally flat valley—the highest hill in sight.

Even at this early hour there was a bustle of industrial activity. His construction crews worked a full three shifts, through the night, on Saturdays and Sundays, and if Barry Price had had his way they'd have worked Christmas and New Year's too. In their latest flurry of activity they'd finished Number One reactor and had a good start on Number Two; others had begun excavation for Three and Four, and none of it did any good. Number One was finished, but the courts and lawyers wouldn't let him turn it on.

His desk was buried in paper. His hair was cut very short, his mustache was neatly trimmed and thin as a razor's edge. He wore what his ex-wife had called his engineering uniform: khaki trousers, khaki shirt with epaulets, khaki bush jacket with more epaulets; pocket calculator swinging from his belt (when his hair was all brown

it had been a slide rule), pencils in his breast pockets, notebook in its own pocket sewed to the jacket. When forced to—as he increasingly was by court appearances, command performances before the Mayor of Los Angeles and its Commissioners of Water and Power, testimony before Congress and the Nuclear Regulatory Commission or the State Legislature—he reluctantly put on a gray flannel suit and tie; but on his home turf he gratefully changed back to field clothing, and he was damned if he'd dress up for visitors.

His coffee cup was empty, dead empty, and there went his last excuse. He keyed the intercom. "Dolores, I'm ready for our visiting firemen."

"Not here yet," she said.

Relieved. For a little while. He went back to his papers, hating what he was doing. As he worked he muttered to himself. "I'm an engineer, dammit. If I'd wanted to spend all my time with legal briefs or sitting in a courtroom, I'd have been a lawyer. Or a mass murderer."

Increasingly he regretted taking the job. He was a power systems man, and a damned good one; he'd proved that by becoming Pennsylvania Edison's youngest plant supervisor and keeping the Milford nuclear plant operating with the highest efficiency factor and best safety record in the country. And he'd wanted this position, to be in charge of San Joaquin and get the plant on line, four thousand megawatts of clean electric power when the project was completed. But his job was to build, to operate, not to explain. He was at home with machinery; more than that, with construction people, power operators, linemen and switchyard workers, his enthusiasm for nuclear power was infectious and spread through all those who worked for him—and so what? he thought sourly. Nowadays he spent all his time on paper work.

Dolores came in with more urgent memos that had to be answered. Every one of them was a job for a public-relations type, and every one of them came from people important enough to demand the time of the supervising engineer. He hefted the stack of memoranda and documents she dropped into his IN basket. "Look at this crap," he said. "And every bit of it from politicians."

She winked. "*Illegitimi non carborundum*," she said.

Barry winked back. "It ain't easy. Dinner?"

"Sure."

He felt the anticipation from the bright promise in her quick smile. Barry Price sleeps with his secretary! I suppose, he thought, I suppose the Department would get upset if they knew. And to hell with them.

He felt the quiet: The building should be humming with the faint vibrations of turbines, the feel and sound of megawatts pouring into the grid, feeding Los Angeles and its industries; but there was nothing. Below him was the rectangular building that contained the turbines, beautiful machines, a paean to man's ingenuity, weighing hundreds of tons and balanced to micrograms, able to spin at fantastic speeds and not vibrate at all . . . Why couldn't people understand? Why didn't everyone appreciate the beauty of fine machinery, the *magnificence*?

"Cheer up," Dolores said, reading his thoughts. "The crews are working. Maybe this time they'll let us finish."

"Wouldn't that make the news?" Barry asked. "Actually, I'd rather it didn't. The