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INTERSECTIONS

by John M. Ford

art: Artifact





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We're building your dreams

YOUR FINEST HOUR . . .

There was a time when eagles fought. When a gallant few, suspended between heaven and earth, decided the fate of nations.

The names echo in the sky forever . . . of the machines: Fokker, Sopwith, Spittfire, Messerschmitt, Mustang . . . and the men who flew them: Guynemer, von Richthofen, Malan, Bong. . . .

Alternities Corporation invites you to that time.

NOT LINK TRAINERS. . .

Leave your arcade tokens at home. Alternities Corporation flight looks, sounds, and feels real. Because it *is* real. The sound of wind in the wires, the centrifugal pull of a combat turn, the flash of twin Spandau machine guns as the enemy jinks in your sights—these can't be counterfeited. So we didn't.

Yet it's all safer than a drive in the country—even if you've never been in an airplane. Even persons denied a pilot's license for medical reasons can fly with us.*

YOUR SKY IS WAITING . . .

There is still a time when eagles fly, in sunlight and clean cold air. Alternities Corporation knows how to find that time. Let us take you there.

Because we're building your dreams.

**For information on Hazard Ratings and flight qualifications contact your travel agent or Alternities Corporation.*

—Approved for advertising release
31 September by Ouray Center.

Herein, Mr. Ford suggests that—just possibly—there may even be more than one Alternities Corporation . . .

Captain Roy Kramer, U.S. Army Air Corps, ran a thumb down the duty roster in the staff room, trying to remember if he was supposed to die today, and if so, how gallantly.

He found the marker: not today but next Tuesday. The squadron would lose him to flak in a raid on some Dutch bridges, and have to struggle back home, leaderless, through a gauntlet of Luftwaffe fighters.

Stupid flak, Kramer thought, *that's pretty cheap*. The German squadrons would have lots of wireheads—who else would go for that sort of barrelled fish shoot?—and the flak would cost him some easy kills. And that could end up costing him money.

He was getting tired of this war, he thought. Much as he loved pistons and propwash, he needed something faster, hotter. Maybe he'd transfer to the Fulda Gap line and gray-ghost Eagles. Or a *Bellatrix*-class starfighter in the Orion Wars.

Roy Kramer, Alternities Corporation Guide Three, turned away from the roster board and took a sip of coffee. The cup hadn't left his hand in an hour, and Kramer had lost count of refills. He looked at the cup, at the band of arrowhead-As chasing each other around the rim. On Kramer's shoulder, just below the Eighth Air Force patch, was another Alternities trademark. The symbol fluttered from the flagpole outside, under the 48-star Old Glory. They never let you forget.

Twinkle, twinkle, Alteco,
How I wonder where we go
When the Homeline's left behind,
Out of sight and out of mind.

. . . at least, not if you were staff. The paying customers always forgot. Always.

The clendar on the wall read 1944. The voices of the Andrews Sisters, or a reasonable facsimile, filtered in from another room, singing about kicking Adolf's ass to the Moon, not in so many words, of course.

Kramer thought that he wasn't so very tired of WWII after all; maybe just the Transalpine '44 line. He could transfer to Pacific Theater and help rescue Glenn Miller for a while. That was one of

the best of the short scenarios. A little air combat, a little exploring, a little ground action, and some great music to top it off. Miller was easily ten times as popular as Amelia Earhart, about whom the scenario had originally been written. She could only say thanks, not play it honey-smooth.

The five-minute warning chimed. Kramer tossed back the last of his coffee and picked his flight jacket from the back of his chair. He lifted the wall phone and punched a number.

"Line Local Control," the phone said.

"This is Gee-Three Kramer, Line Local. Will you verify mission as air superiority?"

There was a pause, the click of computer keys. "Verified dogfight, Roy. Know who you're up against?"

"Barnum von Richthofen and his flying circus."

"Wendy Burden. You in a gamblin' mood, Roy-boy?"

"Not any more."

"Ten bucks and a double Bushmill's says you get bounced."

"No bet." Outside, the scramble siren began to rise. "Kramer verified and out the door."

"Outside, recorded."

Kramer hung up. Tugging his jacket on, he went out of the staff room onto the field.

The air was chilly, with a slight moist breeze that ruffled the grass and stirred the flags on the pole. The sky was that strong pure blue that is only possible on cold mornings; some thin layers of cloud streaked across it, enough to make things interesting, enough for hide and seek and bounce and kill. Perfect flying weather.

It was always perfect flying weather where Alternities' pilots were. There had to be rain, of course, because there were grass and trees and a fishing pond, not to mention clouds. But the rain happened offstage, between the acts. Every now and then somebody who'd seen *The High and the Mighty* wanted to bring a big bird home in heavy weather, three engines out, and if he had the money for private line time, then it rained. And thundered and lightnined and so forth. The plane would be on the wire, naturally, and couldn't crash if you knocked the whole crew cold and threw a brick through the control board, but the staff were paid to pretend they were fighting Fate one-handed and the customer forgot, because the customers always forgot.

Kramer took a long breath through his nostrils, to clear his head. He didn't care this morning who forgot and who remembered. There was good money and clear blue sky and the most beautiful planes

in the world. Many worlds.

Kramer's P-38G Lightning was out of the hangar, waiting for him. The ground crew was tending her, carefully as she deserved. The electrician plugged a digital meter into the diagnostic slots, checking the ignition, the avionics, the lasers—no doubt the kill-sensors and the wire system too, needed, wanted, or not. The chief mechanic tapped an oleo strut with a wrench, listened to the ring and found it good. The fuel attendant handled the hose as if it were a delicate thing, not armored and leakproof, and did not spill a drop on paint or pavement.

The dark green camouflage paint, ordered by the scenario, hid some of the machine's sleekness of line, but Kramer's eye knew the truth, tracking from the egglike nose, past the engine cowlings to either side of the cockpit, down the slender twin tail booms—a little fat in their middles, where the superchargers crouched—to the intersecting planes of the tail, sharp-flat-sharp.

The mechanic held the ladder for Kramer, and he vaulted into the cockpit, his arms and legs as fingers slipping into a fitted glove: a mail gauntlet. Kramer craned his head around, loosening his neck and scanning the other planes of his squadron, the paying guests. Then he slid the canopy shut and touched his throat mike.

"Line Local, this is G-3 Kramer. Verify squadron status."

"Squadron Leader, you are verified for a Hazard Three operation, ten patrons of eleven. Pilot Cupertino is grounded with lubricant boilover and fuel backflow."

Mr. Cupertino, paying Alternities customer, was hung over and puking his guts out. "Roger, Line Local. Drop Cobleigh back to Cupertino's slot. . . . Firing up now."

Kramer punched the starter. His engines did not cough, did not wheeze; they spat once sharply and started singing. Kramer showed the ground crew thumbs-up and they pulled the blocks from his wheels.

"Line Local, this is Kramer, verified and rolling."

"Rolling, recorded, Kramer." A pause, keys working. "About that bet, Roy . . ."

"Ten bucks, okay. But you buy your own drinks."

"Roger, wilco, Roy-boy. Don't let the bandits get you down."

No fair, Kramer thought, *wishing me luck to sour it*, but he was too busy to transmit the thought. He was on his way down the runway, feeling the road through the finely tuned suspension, watching the sky.

And then there came a last light shock, and there was no more

road; the buzz and thump of folding wheels followed, and Kramer and his ship were no more of the ground.

He switched in the flight systems. A spot of white light glowed at the center of the plan monitor's radar map, representing his plane; ten green dots, the rest of the squadron, trailed after. Kramer read heading, airspeed, wind direction and speed, punched them into the pocket computer under his left hand. His right hand stayed on the stick. That was one of the Lightning's rules: you didn't ignore her.

He dropped covers over the inertial guidance board and the computer; except for the plan monitor, every instrument facing him was now pure WWII. Just as the plane, despite the IR lasers and the Lexan canopy, was pure Lockheed Lightning and mean as hell.

The P-38 was not a "pilot's plane." It was its own plane, with its own rules and its own punishments for pilots who broke them. But if you would learn the rules, treat the Lightning as your partner and not some dumb tin hoss, then the two of you would beat any lonesome cowboy in the sky.

Richard Bong had learned the rules. Dick Bong, Ace of Aces, shot down forty enemy planes, more than any other American in the war. Other pilots called the Lightning a deathtrap, but Dick Bong never flew anything else.

There was an unofficial rule, strictly enforced: no matter how many kills a pilot, staff or guest, scored in a P-38—and some, like Kramer, had hundreds—no more than thirty-nine victory flags would be pasted on the hull. Because some people did not forget.

Kramer read the plan monitor. The flight was forming into two-and-a-half finger-fours: two leader-and-wingman pairs like the fingertips of a hand. The Germans, who had invented the formation, had a rule that wingman must follow leader, into the ground if necessary. Kramer had moved his wingman to fill in for Cupertino, and doubted he'd feel the loss. He'd cover his own tail today.

And to hell with Mister Cupertino, who could no more pilot a plane without fly-by-wire than he could hold his liquor.

All of the planes on the monitor were within formation limits; two of the wire jockeys were drifting a bit, but the rest were right on their marks for position and height. Good enough for a Tuesday morning. Kramer pressed his mike three times, signaling Line Local that he was ready to start the game. Then he opened the interplane channel.

"Loose Goose Flight, this is Loose Goose Leader. We're getting into happy hunting ground for a hot-shot Heinie *Staffel*, so keep your eyes where they belong." *Oh, they do love the show.* "Remember,

anybody who gets smoked buys drinks tonight."

Kramer looked at the top clouds, which were denser than he had thought earlier. Through a break in the layer he spotted a shadowed wing. He turned off the radio to swear, then broadcast "Bandits at two o'clock—everybody go for some Angels!"

"Whaaat's that, Captain?"

"More *height*, stupid—" Kramer swore again, silently. You could get fined, even fired, for insulting paying customers, especially on a Hazard Three line. The trouble was, it was Wendy Burden leading the *Staffel* of 109s up there. There was a heavy-money pot among the squadron leaders for most personal kills by the end of the month, and Wendy had a painfully long lead.

But Kramer was grinning as he brought the Lightning's nose up, and the twin props made music to a turbocharged beat. Messerschmitts were too popular for the flight leader's good; at least half Wendy's flight would be on the wire. Seven of Kramer's ten followers were genuine pilots. Plus Kramer. *Dick Bong got forty, all in Lightning strikes*, Kramer thought once more. *Come on, Roy-boy, you're bounced and you gotta bounce back.*

Half a dozen Emils knifed out of the cloud layer, yellow fire spitting from their thin wings. A red strobe flared on one of Kramer's planes as laser light found its kill-sensors, and smoke streamed from beneath its central fuselage, fanning out around the twin tail. The "crippled" plane wobbled, then went dead level as the wire took it over from its pilot. The plane banked gently away from the fight, toward the airfield, comin' in on a wing and a crystal-modulated pulse.

Kramer put his plane into an inside turning climb, feeling the drag of three gees; *lemme see a Link trainer do that!* He straightened out, keeping the nose up—to fight Bf-109s you had to get up there with them—straining against the torque from his twin engines. *Let 'er Buck.* He'd seen that in a photo, painted on a real P-38's nose, had almost borrowed it for his own but thought better of it.

An enemy plane turned, wavered—*ah-hah, wirehead*—fired well ahead of Kramer. "First lesson in deflection," Kramer said aloud, and banked, and raked the Emil's belly from barely eighty meters away. Strobe and smoke canister replied.

"I got one, Captain!" said a radio voice.

"Nice, Stone. Did you get his wingman?"

"His . . . what?" came back, as Kramer rolled on his back, split-essed, and shot the bandit off Stone's tail. "Check six, goddamnit!"

"Now, now, dot's all vell und goot, aber ver checkst *du*?" And a

109, wings nearly vertical, slid down past Kramer near enough for him to see the face in the cockpit. "Takkatakkatakkatakka!" Burden yelled, on the staff frequency.

Kramer tipped his wings and weaved, scissoring with Wendy, trying to drop behind her—or at least stay wing-to-wing. Wendy'd give you one on credit, but never two. *Never* two. She couldn't kill him dead today, of course, it wasn't scheduled, but she could smoke him good. And when he "crawled home through enemy lines" tomorrow morning, he would be gleefully presented with tonight's bar bill. Which wouldn't have been so bad, except that as staff none of that bill would be his. *When the pros tilt the machine, we lose the bonus points.* Kramer thought of Wendy. *And the extra—*

"I tell you vat, Amerikaner. Ve got our own kvarrel, na ja? Ve go up und settle it vun-on-vun, like von Vatsisname and dot odder guy."

"Will you can that ridiculous accent?"

"Aaah, you're no fun. Least not where I can't *getcha*." She flicked back to the general frequency. "*Sind Sie ein Turtle?*"

"You bet your sweet—" Kramer gritted his teeth.

"Last one to Angels Twenty's a wirehead!" Kramer winced again—you weren't *ever* supposed to use that word when a customer could hear—and he pulled back to match Burden's climb.

Then he saw the fog; and in half an instant it had him.

No Burden; no squadron or Staffel; no sky. Just a white . . . *something*, with Kramer in the middle of it.

Definitely not a cloud; he'd been in a million clouds, including storm cells. Anyway, if there had been weather coming Line Local would have vectored them all away, or called somebody to fix it.

His instruments weren't reading. Altitude zero, turn-and-bank zero, airspeed zero. Kramer thought of vacuum failure, but all these instruments had electric backup, and the electrical system was working. Lights were on, and the motors were spinning the props (though the tachometer denied that).

Kramer uncovered the inertial navigator. The red diode displays, so incongruous in a '42-vintage cockpit, read all zeros, more incongruous still. No one answered on any radio frequency, including the emergency channels.

He was rapidly running out of options. Ordinarily there was some course you could take, and be safe while you thought things through; at worst a nice flat oval. But what was flat, here? Seat-of-the-pants wasn't nearly good enough in this mess to keep him out of mountains, trees, and other objects harmful to aircraft.

Taking a large swallow of pride, Kramer uncovered the switch that would put him on the wire. When you were staff ranked Three or higher, they gave you the choice. It was one of the several things Kramer liked about the Corporation. Sometimes he thought he liked this one better than the money.

Kramer pulled the switch.

Nothing happened. The OVERRIDE ACQUIRED lamp didn't light. The plane's attitude didn't change—at least, not so Kramer could tell.

And as he thought this through, something did happen: some of the white fog (or whatever it was) seemed to waver, as with heat, and turned silvery—a ring the color of crumpled tinfoil (or *crashed airplane*, Kramer thought) with a white patch at its center.

Though Kramer was not at all sure of distances, the white target looked just about P-38 sized.

"Any old port," he said, and pointed the plane, and went through the ring.

He nearly creased a hangar roof with a wingtip. The tiny airfield below—not one he knew—had just appeared out of nothing, and before he really decided what to do he had completely overshot it and was back in the whiteness.

And then—without having touched stick or pedals—he was buzzing the field again, from a different direction.

People were running on the ground, and the sound of an air-raid siren drifted up to him. The whine was oddly muffled, not just drowned by the sound of his engines. He overshot the field again—and again was above it.

Kramer circled experimentally, close to the white stuff. Whenever he edged into the fog, just nudging it, he was nudged out again. He looked around for the silvery circle, but it was gone.

A black cloud blossomed near him: a flak burst. *Did I read that damn chart wrong after all?* he thought. *No, I've strayed over a hill to Wendy's base . . . guess who's going to be buying tonight?*

Another burst went off, close enough for Kramer to hear the whistle of steel fragments. Something pinged off the plane's nose. *Oh, God damn, not a Hazard Five line.* He wagged his wings frantically and landed.

The flag hanging limp against the pole was a Union Jack, and no Alternities banner hung below it. Kramer did not recognize any of the people who moved slowly toward him; all he knew were the British uniforms, the Enfield rifles, the Webley revolvers.

He raised his hands. What else?

§ § §

Kramer paced the dispersal hut where the British (if indeed they were) airfield crew had put him for storage. There were six unmade iron beds, shelves and a cheap dresser holding personal things and bits of spare flying gear, and the debris of a fighter scramble: open books turned face down, half-full teacups, cigarettes left to burn themselves out. There had been no five-minute warning, obviously. A tiny coal stove put out a little heat, but not much; if he were a paying customer he'd have complained. *No, that's wrong*, he thought. *The customers like it. Part of the game. We're the ones who like being warm and dry.*

Kramer picked up a framed photograph, of a pretty young woman in an austere dress looking hesitantly at the camera. He read the inscription: *To Charlie from his favorite virtue. Patience, August 1940.* Kramer felt an unpleasant tightness inside and put the picture down, trying to restore its exact position.

Yes indeed, Roy-boy, he thought, *if things are really what they're looking like around here, you'd better be very damn careful what you touch.*

He sat in a rickety chair and took mental flights around the room, buzzing the piled sheets, orbiting the stove chimney, split-essing into the valleys between the beds. It kept his mind away from the windows, and the airfield beyond, the fog beyond the field . . . and what was beyond the fog . . .

Kramer picked at the Alternities Corporation patch on his shoulder. *How do I tell the real from the fakes?* For nearly an hour he'd searched everything in the room for the Alternities arrow-A trademark, printed on or stamped into something. But it was nowhere to be found.

This *had* to be a line. Maybe a Hazard Five. They shot real bullets at each other; maybe Alternities didn't bother to label everything for the suicides' benefit. It had to be a worldline, because the alternative was . . . there was no alternative. They could *squeeze* time, sure, just like the ads said, a week's vacation in twenty minutes. But the first thing they taught in staff school was that time dilation wasn't time travel; no matter how much a line looked and sounded and smelled and tasted like the past or the future, it was all an illusion. They never let you forget it, either.

This *must* be a Hazard Five. They were all crazy on the Fives. Ever since Senator Cadogan got suicide legalized, the crazies kept finding bigger and better ways to do it. Alternities collected the dividends.

There was a knock at the door, and two men in pilots' uniform

blues with lambswool jackets came in, followed by an officer with Intelligence badges. No Alternities signs in sight. "Station Commander 'ud like to see you now, Captain Kramer," one of the pilots said, quite genially. "Follow us?"

The pilots didn't look crazy, or sound crazy. Scared, a little, maybe, but Hazard Five types weren't scared of anything but living another day. The Intelligence man said nothing, and his look was blank; as they went out, Kramer saw the bulge of a revolver in his coat pocket.

It was freezing or a little below on the field, and damp, worsening the effect; but there was no wind at all. The flag, and a wind sock atop a hangar, hung dead. The air had a dense, unresonant quality, as if the world were embedded in clear resin, or a snowball paper-weight. Kramer exhaled, and noticed that his breath did not form clouds.

There were no other people visible, and though a field like this should base about two dozen aircraft, only two Hurricanes could be seen, in a maintenance hangar with their engine cowlings open, the motors gleaming dully in the dull air. His own plane was gone, somewhere.

And in the distance, only a few hundred feet beyond the end of the runway and the last wooden building, there was . . .

Nothing.

A bowl of whiteness was inverted over the field. Kramer had been thinking of it as fog, but it was not like fog. There was no gradually increasing obscuration with distance; the airfield was clear, if dull, out to a point in the middle distance—and there the world ended.

Overhead, it was not like overcast. Clouds had qualities—they rippled, they moved, they showed a bright spot where the sun was—this stuff had no qualities at all, except density and pure typing-paper whiteness.

Kramer recalled that he had not been locked into the hut. He wondered if it had been purely from courtesy. Where, after all, could he go?

"Care for a cigarette, Captain?" one of the pilots asked.

"Here. Have one of mine." They paused to light up Kramer's low-tars. Kramer watched the white smoke trail slowly upwards, straight up, without even curling. He wondered if it could escape.

And if not, what they would shortly all be breathing.

Station Commander Loyd sat at the opposite end of a conference table from Kramer. His uniform was neat, his gray mustache trimmed, but his eyes gave away the state of his mind; they were

intense, twitching.

To Loyd's left was a WAAF corporal, holding a pencil ready over a pad. For the past hour she had been transcribing every word spoken in the room. Most of the words had been Kramer's. To the Commander's right was another woman, slightly older than the WAAF, in plain civilian clothes; she had pencil and paper before her as well, but the pad was blank and her hands were folded.

Kramer's idents were on the table before the Commander. The Intelligence man held a dollar bill from Kramer's wallet, turning it over and over. A few pilots and mechanics sat against the wall behind Kramer. All maps and charts still in the room were covered. Through a window, its panes taped to trap fragments, the null sky was visible, completely unchanged from an hour ago—or the three hours since Kramer had flown out of it and landed.

"Your opinion, Lieutenant Moore?" the Commander asked the Intelligence officer.

"Excellent work," Moore said, and put the bill with the other papers, giving it a small final push away from himself. "So good that . . . such craftsmanship would seem better applied to a fifth-column counterfeiting operation, rather than one such as this. If not for the date on the currency . . ."

"Can I ask what kind of 'operation' you think I *am*?" Kramer said.

"I will remind Captain Kramer," Loyd said stiffly but not harshly, "that while not a prisoner he is in custody . . . please don't speak unless asked, Captain."

Kramer nodded.

"Since the question is relevant, however, I shall answer it. I believe you were sent here to do exactly what you have done: tell us a story, corroborated by these papers and . . . other superficial details, of being from some . . . time in the future. Were we to believe this fantasy—"

"H. G. bloody Wells," one of the pilots said, and there was laughter in the back of the room. The civilian woman smiled faintly, and looked at Kramer for the first time.

"Corporal Parkes, you'll strike that comment," Loyd said, and the WAAF steno scratched at her pad. Loyd turned back to Kramer. "Were we to give even the smallest credence to this story, you could then issue 'prophecies' affecting our conduct of the war."

Kramer said, "And you think a plan like that would have a chance in hell of working?" Simultaneously he thought of Operation Mince-meat, "The Man Who Never Was," who had succeeded in his mission of deception despite the handicap of being dead.

Loyd said, "I doubt it very much. But after Herr Hitler's leaflet making 'a last appeal to reason,' I daresay almost anything might occur to the man." He looked around, got a late, small laugh.

Kramer said, "Some of that stuff's a long way from being superficial evidence. Look at my plane, for God's sake. It's a Lockheed P-38G Lightning. The first of them won't roll off the line for two years yet; call Lockheed and ask—" He stopped, frozen by cold, cold looks from all around the room. Lieutenant Moore spoke: "No one is saying . . . the Germans are stupid," and Kramer supposed the pause had swallowed a "you."

"With a few exceptions in high places," a pilot added, and there was more laughter. Loyd opened his mouth, but his face softened as he did so, and he said, "There are quite a few places we'll be ringing up in time. However, just now our 'phone lines are out—a Heinkel crew will be painting that one on their ship, I suppose—and wireless appears to be suffering in the . . . meteorological disturbance." He looked through the window, but not for long.

Kramer understood perfectly. It was so much easier to believe in fog and Germans. Fog and Germans were threats to navigation and telephone lines, not sanity.

The telephone by Loyd's elbow rang. Its tone seemed muffled by the air. "Another victory for the Post Office," Loyd said, and picked up the receiver. "292 Squadron, Station Commander Loyd speaking . . ." His smile vanished as quickly as it had appeared. "I see. Very well then." He put the phone down. "The ground crew would like us to have a look at Cap—Mr. Kramer's aeroplane." He looked straight at Kramer. "You appear to have convinced a few of us," he said, in a voice that was level and calm and deadly bitter.

"*'Lightning Strikes Twice?'*" someone read from the airplane's nose.

"I should have thought better of it," Kramer said under his breath.

The P-38 stood in a vacant hangar under direct lights, surrounded by half a dozen mechanics. One was examining the twin tail-booms, measuring the distance between with spread arms, making notes. Another sat in the cockpit, moving with great care, sheer bewilderment on his face. The rest crowded around the underside of the starboard wing, waving inspection lamps, and Kramer knew without seeing that they had removed the gun inspection panel.

"It's a gas line, but it's not gas cooling," one of them said. "Not leading to the muzzles—and certainly not if it's really acetylene gas. Could be muzzle heat—but there are *these things* . . ."

"What is it, Douglas?" a pilot asked.

"Haven't a clue, sir—but for certain they aren't guns."

"Perkin-Elmer"—I've heard of them," another mechanic said. "Make infrared stuff, don't they?" He turned to the approaching group, called, "Doesn't that make it your department, then, Miss Jaynes?"

"It might," the civilian said. With a passing glance at Kramer, she folded her arms and walked under the wing.

"Are you a scientist?" Kramer asked suddenly, a connection closed in his mind. "With radar—Watson-Watt, someone like that?"

There was an abrupt silence, and Kramer wondered if he had just gotten himself shot dead.

Miss Jaynes came back around the plane. She was the only person moving. "Tizard Committee," she said evenly. "I'm doing mathematical analysis of—the Squadron. These people do think a scientist's a scientist, though."

"But every inch a woman," someone said. Intelligence Officer Moore cleared his throat.

"What are they?" Jaynes said. "Even I know they're not guns."

"Infrared lasers—oh, God. They're . . . light rays, sort of."

"Death rays, now," said a crewman.

"No," Kramer said. "I told you, we have simulated dogfights. Instead of bullets, we shoot light beams. When the beams touch a sensor on the other plane, it registers a hit. The gas bottle makes muzzle flashes and noise."

"Is that possible?" Loyd asked, of no one in particular.

After a pause, Jaynes said, "Professor Lindemann talks about infrared a great deal. Of course, what he says is Most Secret."

Moore turned deliberately away from her, toward a pilot. "Couldn't bombing pathfinders use something like that, instead of flares to mark the target?"

The pilot looked nervous. "I don't know . . ." He took a half-step away from Kramer, who burst out, "Oh, come on! Look at the god-damn sky, will you?" He gestured around the silent airfield. "Are you *really* still just waiting for the fog to lift? If I just popped over from jolly old occupied France in the lovely weather, where's the rest of your damn *squadron*?"

They put him in a closet this time, and locked it.

The click of the lock woke Kramer, who sat head on knees in a corner. He didn't think he'd been dreaming. Dreaming of nothing, maybe. White nothing.

The door opened a crack. Slender fingertips curled around the edge. "We can't possibly talk in here," came Miss Jaynes's voice. "I'm taking him to the Mess for a cuppa."

"Are you sure, Vicky—?"

"Of all the things to ask, Alan. If he tries to use me as a hostage, I give you the Committee's approval to shoot.

"Captain Kramer? Would you come with me, please?"

He had no other options, of course.

They sat in the Officers' Mess, which would have been bright and airy in a different light and air. The blackout curtains were drawn—to block the view out, Kramer knew—and the electric light seemed to not quite reach into the corners. The smells of cigarettes and stale sweat were apparent but not strong.

Three officer pilots came in, "just for tea," and sat far away from Kramer and Jaynes, but they did not converse and there was nothing else to listen to.

"I want to talk to you about 'worldlines,'" Jaynes said.

"I don't know that much. Not technically, anyway . . . I just work there." He smiled. She returned it.

"That's all right. I'm just . . . well, I'm looking for something to do, I suppose. How many lines are there?"

"Uh . . . I don't really know. Let me think. Alternities advertising talks about twenty . . . the WWII line, the Three Musketeers—France line, the Medieval line, and so forth . . . but there are five Hazard Ratings, and some of those are on different lines, but some aren't. Plus there are some variant lines. And there are twelve gates at Ouray Center, under the Widow's Walk—"

"The *what?*"

"The gates are in a circle, facing out. You get dressed for your line in the center area. And on top of the center—uh, the Center center—facing all around, is an overlook, with glass, where the techs sit and run the controls. They call that the Widow's Walk, like those balconies on houses in seaport towns, where the captains' wives wait—"

"Yes, I know," she said, and looked toward the lieutenants across the room.

Kramer flew blind for a moment. She was really quite striking, he thought distractedly; not much of a figure—though who could tell, under that stovepipe suit?—but a jewel of a face, framed by deepest-brown hair. No makeup . . . don't you know there's a war on?—fine. Makeup confused the issue, created an artificial ideal of lips and eyes.

It came gradually to Kramer that these thoughts were irrelevant, and he said, "Anyway . . . I'd guess eighty or ninety lines. Apart from Homeline."

"Which is . . ."

"Where we come from; where Ouray Center is. Home, you know."

"Doesn't anyone come from another line?"

"Of course not. There's nobody on the other lines, except the live-out staff. I went out past a Corporation boundary once, on the Hazard Four version of Transalpine '44. We were bringing in a flying bomb that wasn't on the wire. It was pretty d— . . . barren out there. Once you got half a kilometer beyond the fence—"

He stopped, aware she was staring, feeling the eyes of the other pilots burning his back. He looked at the draped window, realized how close to their present reality he had come.

Then, not as a question, she said, "Flying bomb."

Put it back where you found it, Kramer thought, and said, "Nothing . . . a weapon . . . forget I said it. If I tell you any more, you'll think I *am* making prophecies to scare you. It didn't work, anyway," he added, not sure whether he meant the real V-1 or Alternities' imitation, too frightening to be part of the fun.

"Hear that, mates?" came a voice, possibly drunken, from the other side of the Mess. "Cassandra 'ere says the doodlebuggers aren't gonna work. When's Adolf gonna give 'em up, then?"

Kramer said, "You told me . . . this was 1940."

"Twelfth November, if the clocks are still running properly."

Kramer stood up, rocking the teacups. He looked at Jaynes's puzzled-intent face, then around at the pilots, who were hunch-shouldered and hard-eyed. He was thinking it all had to be a joke, a great unfunny practical joke Line Local had played on him for getting lost in the clouds and pulling the chicken switch, and any moment Wendy and Heinz and Bill and Lin would pop out and demand to know if he was a Turtle, and everybody would buy everybody else drinks at the O-Club bar—

It was not until they showed him the victories board for the dozen bombs the Squadron had downed that Kramer really knew it was no joke, funny or otherwise, that no one was going to appear and laugh and show him Homeline beyond the stage fog. "Not until 1944," he said, "they didn't start until we were already in France," but here it was 1940 and this fellow had knocked three down with a wingtip and that one's aunt was killed in Eastcheap and Jaynes the mathematician stayed up late nights plotting the courses of the damned things.

"But if I'm not on a line and I'm not in the past then *where am I?*" he persisted, until the Surgeon gave him a shot of morphine and he went to sleep, dreaming quicksand dreams of the V-2, and the A-10 also called *the America Rocket*, and the bomb to end all bombs, and four years' head start on them all.

Dr. Victoria Jaynes, Ph.D. Mathematics, Cambridge, stood in the still, cold, unnatural air, watching from a distance as the ground crew fixed a rope to Lieutenant Crisp. Alan smiled and nodded and gave testing tugs at his altered parachute harness. She could not hear him from this far away, but supposed he was making jokes and jolly-good-fellow conversation, just as if he was going to knock a few Huns out of the sky.

She looked up; smoke from the generator and the hut stoves was rising straight up as far as she could see, not bending, not diffusing. The barrier must be permeable, then, at the level of smoke . . . and if smoke, then oxygen. At least they wouldn't suffocate.

Alan waved, and they made the rope taut, and he walked off the edge of the field into the fog.

At once Jaynes understood what Kramer meant by its being wholly unlike fog; Alan was not enveloped, or gradually made indistinct. For a moment his figure seemed to streak, as if seen through a rain-wet pane, and then he was gone; and the rope stood straight, reeling into nothing.

"Take a field telephone," someone had said, "take an Aldis lamp," "take this and that and the other," until he'd said, "Isn't it enough that I'm going out to dangle like a bait on a line? Just let me go—" and they'd let him, of course. The Squadron Leader might have been able to overrule him, but if the Squadron Leader were here *he* would have been alone on the end of the rope.

The second marker flag came off the drum of rope; twenty yards. Jaynes tried to watch the flag's progress, see how far away the vanishing point was, but Alan's travel, or the flag's, or the flag's image's, was unsteady and the disappearance too sudden. She thought irresistibly of Einstein's thought experiments.

Thirty yards of rope.

Forty yards.

A dark spot appeared, near the rope's end, and Alan Crisp was marching out of the whiteness, trailing his rope, which still fed taut from the drum, through the air, into nothing and back again.

Jaynes gathered the papers she had been holding—aware vaguely that some sheets were crumpled in her hands—and walked quickly

into hearing range.

"—round a tree, then, did you?" Commander Loyd was saying.

"Hardly, sir, since I never saw a tree. Nor so much as a bush. Or a pebble."

"What's it *around*, then?" said a WAAF, and a mechanic gave the rope a hard pull. Alan nearly fell backward.

"Will you watch that?"

"Sorry, sir. But . . ."

"All right. Together, then." Alan turned and grasped the rope. He pulled. The mechanic pulled back. More men and women joined in, tug-of-war fashion. Even the Commander took a hand.

"No good!" Alan shouted. "I'll have to—"

All fell down, the rope tumbling after. Without getting up, they pulled it in, a flag appearing, then another, another, and the last—until the whole intact rope was in their hands.

"Well, bloody *hell*," someone said, possibly Alan. Someone laughed, and the laughter rose and spread, stifled only by the dreadful air.

Jaynes knew the sort of laughter it was, though, and was not ready to join in. Hugging her papers, she walked away, toward the Messroom and hot strong tea.

With a cup, her slide rule, and a pencil, she sat plotting the intersection of universes on a sheet of quadrille paper. She thought on that word, *quadrille*; *how proper it should be a dance as well*. Like Lewis Carroll's Lobster Quadrille. She could hear the clicking of claws.

No. No. I don't hear anything.

She tried to count universes, or "worldlines" as Kramer called them. Eighty or ninety, he said, but that was not a proper mathematical quantity. *There is one x such that . . . or there are infinite x such that . . .* but not some intermediate, casual number.

There must be something else countable, that might lead her to the numbers she wanted.

There were two wars—Kramer's war, over before he was born, and her own (and Alan's and the Commander's and the Squadron's). Two wars. Two Squadrons. Two Englands. As in a mirror.

Or between two mirrors, creating an infinity of reflections between them. Kramers, Jayneses, Loyds, in rows forever. And Churchills, Stalins, Hitlers, ranked like lead soldiers. Little tin Hitlers, more than real numbers could count.

Her pencil point skidded and broke, in the grip of her oldest fear.

"What's the matter, Vicky?" her father said. "Harmony Gloria, it's cold out here. Aren't you chilled?"

Victoria Jaynes, six years old, stared up at the night sky and shook her head stiffly. In her lap was a sheet of paper, covered with pencilled numbers. She was being very, very careful, but in spite of it one big tear escaped her eye and went plop on the paper, making a digit pucker and run.

Professor Andrew Jaynes put his knees together and knelt on the tiles of the balcony, between his daughter and her telescope. He took Victoria's shaking hand, held it delicately, as if she were her namesake Queen.

"I can't count them," Victoria said, holding fast to her voice but letting the tears slip away. "They go off and on. And there's too many. There's . . ." She had lost the word as well. ". . . forever many."

The professor nodded. "Too many for tonight, certainly. Come inside and have some hot cocoa. And tomorrow I'll take you on a visit."

The man they went to see the next day had an office filled with pictures of stars; clusters of stars, thousands, millions of stars staring down from the walls. He listened very carefully to Victoria. And then, with star charts and graph paper, the astronomer showed her how to sector the sky: to lay a grid on the universe, so that the stars could be counted, one small square at a time.

Victoria started work that night. She was finished in a week. Not with the counting; with the need to count. She was finished with the fear of large numbers, forever.

She looked at her broken-pointed pencil. Very deliberately, she took it in both hands and snapped it in two, then dropped the pieces in the dustbin.

It had only been a few years ago that, reading a *Times* obituary, Jaynes learned that her astronomer had been Britain's Astronomer-Royal. She had never known, and it was too late to say or do anything.

She sharpened another pencil. As she bore down with it, the wood creaked, and she flinched. The pencil slipped from her fingers, rolled across the galaxy expressed as a tensor grid. She reached for it, reached further, but like the tortoise running from Achilles in Zeno's Paradox it stayed a bit ahead, just a bit, and the abyss yawned at the table's edge—

The pencil fell, and rose, cradled in Roy Kramer's fingers. He handed it back with some greeting Jaynes did not quite hear. She nodded, universal reply; muttered, "Sorry—thought you were a turtle."

"You bet—" He shook his head, and without finishing the statement went away for a cup of coffee. He came back, sat down across from Jaynes, looked at her papers. "How's it going?"

"Around and around in circles," she said. "I . . . you need a physicist, Mr. Kramer, not a mathematician. My father would be right at home here . . . but I'm just pushing variables around. Even if I find some theoretical foundation for your having come here, it may be no help at all in getting you . . . us home." And as she said it, she wished he would go away and let her get back to the problem. She picked up her slide rule. "Excuse me, Mr. Kramer, but I seem to have mislaid a decimal."

He touched the slide rule, laughed. "Wait. Just wait. I've got something in the plane that'll startle you." He got up quickly. "Hold that decimal point!" Kramer dashed through the door, letting it bang.

Jaynes looked down again. She was trying to forget Kramer's intrusion, but was not succeeding. And she was trying very hard.

She tugged at the lined-over sheet beneath her Perspex French curve; the graceful arc on the paper was supposed to represent the trajectory of a particle forward on a time line—or a time-like line—through a universe of nine spatial dimensions. Six of the dimensions had imaginary numbers as coefficients.

And what was wrong with that? Just because they're imaginary doesn't mean they're not real. Besides, three dimensions isn't any more proper a mathematical quantity than nine.

She rotated the diagram, tilting it so different grids were compressed in perspective, and in a bright flash she saw the unintended symmetry of two positions, and then a third; all the dimensions seemed normal from their own viewpoints. If you were in the $+i$ universe, *any* $+i$ universe, your own mathematics would seem quite ordinary, while that of the other worlds looked irrational and strange.

And if space looked that way, why not time?

She sketched a circle along the swooping time-like line. From an internal frame of reference . . . if you were inside the circle . . . a time of n dimensions would look like another space of similar form.

The circle became a sphere, a perspective cube. A tetrahedron might work better, but for now this was enough. More than enough. *More than filling sandbags, Father.* She watched as the cube changed perspective in the classic optical illusion, now open from this end, now from that, now from this again . . .

" . . . all right then, Doctor?" She looked up with a start. Com-

mander Loyd held the teapot in his right hand; his left rested very lightly upon her shoulder. As he slowly drew it back, she realized that her pencil was worn flat, and there was the coldness of tears around her eyes.

And the Commander's touch had been no more than the pilots sometimes got, when they came back with holes in their wings, and fewer than when they had gone out.

Though there was no resemblance at all between the two men—not even the touch on the shoulder—Jaynes suddenly saw her father, home from work at the Cavendish Laboratory. She had known from the tilt of his shoulders and the way he hung his hat that it had not been a good day in the Most Secret workshop.

"I've got some work for you, Vicky," Professor Jaynes had said, very seriously, tiredly. "It's not much, but it's mathematics. With Henry Tizard's people, so you'll have some authority. . . . Though for someone with your talent it's no more suitable work than filling sandbags for the W.V.S." He sat down in his favorite chair, knees together, back straight. He looked directly at her as he spoke, as always. "Lindemann came in today," he said. Sir Frederick Lindemann was the Prime Minister's science advisor, and a power in the land. "He asked about you, and I said you'd gotten your doctorate . . . and he said, 'Ah. And does she still make those splendid butter biscuits?'"

Victoria would have laughed, but her father's face prevented her. She thought she saw him tremble, wondered what would come out if Andrew Jaynes would only allow it. She could remember him differently, recall his comic distraction when atomic particles refused to behave properly, his bubbling joy when they did. She remembered walks in the park, where he would explain how light was waves and packets at once, pond ripples and popcorn.

It was the war, she would tell herself. And then she would tell herself it was not the war at all, or at least not the war against Hitler.

What had he been like with Victoria's mother? Had he talked of orbits and observable phenomena in an embrace until dawn . . . until she had died, with Victoria only two and less capable of understanding death than she understood the red shift (as of eyes when things close to them recede . . .).

It was only lately that Victoria had seen that her father's courtly embarrassment extended to every woman in the world . . . and Victoria was not a little girl any more.

"You'll be . . . careful, won't you, Vicky?" Professor Jaynes was

saying. "Lindemann still hates Tizard, and . . ." He smiled awkwardly. "I'm so proud of you, Doctor. Just be careful, where there's power involved."

"Work's a help, of course," said Commander Loyd, from another universe. "But all work and no play, hmmm? Tell me, Doctor, do you play chess?"

Vectors in an 8x8 space . . . As she was about to answer, Kramer burst through the door, saying, "Damn! It's gone."

Loyd looked upward. "The . . ."

"Huh? Oh, hello, Commander. No, it's still there. Look, there was a little silver box in my plane, in the cockpit. Had a lot of buttons on it, and a line display—uh, a strip of glass. What happened to it?"

"Intelligence Officer Moore has it. Coding machine, he said it was."

"Well, it's not. Can I . . . can you get it back from him?" Kramer looked at Jaynes. "Miss Jaynes needs it for the work she's doing."

Loyd's look asked Jaynes something she could not answer. He stood, said, "If it's important, then of course I'll ask the lieutenant. Good day, Doctor. Mr. Kramer." He went out of the Mess.

"Wait'll you see this," Kramer said.

She nodded, the music, the voices in her head fading. *No. I never heard anything.*

She tried to ask him a few more questions about Alternities and the multiplicity of worlds; his answers rambled, and finally he said, "Look, I'm not much on theory. It was . . . what I *did*, you know? I'm a Guide, not a Tech. I fly planes—"

Loyd came in, holding a small flat object in both hands. Moore was behind him.

"We'd all like to watch this, if you don't mind, Mr. Kramer."

"Sure, Commander. Here, let me have that. Right. Sure you don't want to take notes, Lieutenant? This is a real Intelligence prize, even if it isn't a code machine."

"Scientific Intelligence is my responsibility," Jaynes said quietly, before anyone else could say any more.

"Whoever," Kramer said, and set the box before himself on the table. It was a little longer than a cigar case, less than an inch thick. On its surface were forty or fifty tiny buttons, and a long strip of glass with a mirrored surface beneath.

Kramer touched a button. The glass flickered along its length, and a hollow square of dots, and another dot, stood out dark at one end of the strip. Jaynes moved her head; the dots were not below the glass but within it.

Then she realized that they were not just dots; they formed a zero and decimal. She began reading the labels on the buttons: there were the arithmetic operators, and sine, cosine, tangent, Σ +, logarithms common and natural, and more signs she did not recognize, like PEEK and POKE and GOTO.

"It's got a General Aviation program loaded now," Kramer said, "but we can erase that if you want." He touched more buttons, and an algebraic expression, with signs and parentheses and superscripts, spelled itself on the glass. Another few touches, and the characters shuffled about, a quadrille of black dots on silver, and another expression appeared. "I don't remember what I set up there," he said, "but that's the answer." Jaynes was perfectly sure he was right.

After half an hour of playing with the "computer," Kramer said, "Do you think this will make the work any easier?"

"Much," was all Jaynes could think to say. Moore and Loyd just stared at the box. Moore finally said, "How?" in not much of a voice.

"I was afraid you'd ask that. Do you know what transistors are? How about . . . valves, I think?"

"I know a bit about wireless," Moore said.

"Yeah, good. Well, this has thousands of . . . valves inside it. Etched on a silicon wafer with chemicals and lasers."

"Lasers?"

"The death rays on my goddamn *plane*," Kramer said. "Look, I like to think I know what goes on in the world, but I can't know everything." He covered the device with a hand. "And I warn you, you won't learn a thing by taking this apart—you'll just break it. And the Doctor here needs it, okay?"

"Mr. Kramer," Commander Loyd said, in a voice that made them all sit straighter, "I will remind you that you are a guest of this aerodrome, and not a ranking officer."

"Sorry," Kramer said. "Really." He held out a hand to Moore, who took it.

"Lieutenant," the Commander said, "I want to check on the petrol supply for the generator. If this clears—" he made no indication of what, and did not need to—"in the middle of the night, we'll need to light the field. For the Squadron. If you'd care to accompany me?"

"Of course, sir." They stood. Near the door, Moore said, only nominally to Loyd, "If he *is* a Jerry . . . well, I don't suppose I'll be voting for Herr Hitler."

After the door closed, Kramer said, "What was *that* about? Does he still think—"

"It's a joke."

"Not funny."

"You don't understand. When we get a captured German flier here, Mooresy questions him. The last thing he asks is, 'Since it may be some time before you can be repatriated, do you think you'll enjoy life as an Englishman?'"

"Odd question."

"Exactly. It's so unlike the usual what's-your-name-and-unit stuff that it puts them off balance, and they burst out with the most amazing things.

"Once he had a staff officer—the man had been a pilot in the last war, and he was a real old Prussian Junker type. One of Fat Hermann's pals, I suppose, but a decent . . . anyhow, Mooresy asked his question, level as you please.

"And the officer stroked his mustache—'like they had a stroking formation in the Book,' Alan said—and said, 'Perhaps. But I doubt that I shall vote for Mr. Winston Churchill.'"

Kramer was quiet a moment. Then he laughed. "So the lieutenant's all ready for the invasion. What's he do, when he's not looking for spies? I heard most of the Intelligence types were schoolteachers."

"Actually, he runs a wireless repair shop. Rather large one, too."

Kramer stopped with his mouth open.

Jaynes looked at the draped window. "He should be in radar, but of course he hasn't any college, and I'm the only scientist he knows. Great help, that. He gave his profession as 'shopkeeper,' and whoever decides such things decided he could tot up columns of downed aircraft. He decides whether a kill counts on your record or not—is it any wonder the pilots all talk past him?"

"I see," Kramer said, and for the first time Jaynes believed he did; he seemed actually to be listening. Then he pushed the calculating machine toward her and said, "I'll show you how to program it," and she knew that she would be doing the listening, and (the click of keys in the Number Quadrille) it would be of her own will that she was silent.

Time passed in clusters of hours—days were counted, but seemed artificial without sunrise or nightfall. The air remained clean, without a hint of a breeze, and without freshness. It was still cold, but without wind to cut, the cold was noticed less and less.

To save on generator fuel, Commander Loyd ordered lights put out and curtains opened, and before long everyone was used to the sight of the white overhead—you could tell yourself it was just like

morning fog on an overcast day, if you kept telling yourself so at frequent intervals, along with things like "better than being a submariner" and "better than hiding in a tube station or an Anderson shelter." The commander issued ration notices for water and food, partly from a real concern over the finite supplies and partly to give himself something to do in the absence of his Squadron. He should by rights have rationed Jaynes's paper and pencils, and she knew it, but he never did.

Everyone needed something to do. The pilots and mechanics sent out a few more expeditions, with field telephones and signal lamps but with no more success. They even tried to tunnel under and out, but the lead man down the hole came up white as the barrier itself, his yes like full moons, and they filled the works in quickly. The WAAF kept at their jobs, packing parachutes and folding forms until it seemed quite insane, and several went cheerfully enough when a young man asked them, neither they nor the young men caring that they could not go very far.

Lieutenant Moore shuffled his Reports of Enemy Downed, and over the wireless operators' half-hearted protests assembled a power supply for the little computer, since Kramer had no idea of how long its batteries would last. Kramer tried to explain laser beams and inertial guidance and failed, so he concentrated on explaining his airplane, and the weaknesses he'd found in flying the German ones, and the need of beating the Luftwaffe as badly as they possibly could. He described the silver ring he'd flown through, told everyone that if it should appear again to get him, no matter what he might be doing, really no matter what.

It did not appear.

Two maintenance crewmen disappeared completely for thirty hours. When they were next seen, one swore he had been nowhere at all; the other couldn't remember. Their watches were running, but disagreed with each other and with the base clocks. Neither had grown any length of beard.

Jaynes saw all this because she forced herself: for six hours each day she walked around the field, watching, listening, not going near her quarters because she knew once inside she would not come out.

"That's check, Doctor," Commander Loyd said from across the chessboard. Jaynes looked up at him, startled; for a moment, in the black and white pieces so neatly arranged, she had seen . . . a fragment of the whole . . . She said, "Smoke and air can penetrate because they're molecular. Quantum phenomena, not Newtonian at all. My father . . ."

Loyd nodded gravely, glanced at his watch. "I've lost this one, I fear. Why don't you get some rest, Doctor? It's time, certainly."

"Of course it's time, what else . . ." She caught herself, and wandered back to her room, where the lines and numbers waited; and she rested without sleep, and was freed of space and time.

Time was not interchangeable with the other dimensions after all; that theory had broken on the third sally, and Jaynes had practically forgotten it. Time was rightly enough a set of dimensions, but one nothing like the others. That was absurd, and she laughed.

She wondered if she would have to invent a new set of numbers to count time. Jaynes numbers . . . *I'm so proud of you, Doctor Jaynes. Thank you, Professor Jaynes. Have a butter biscuit?*

A line of numbers sped past, too fast to count, but she knew them nonetheless: j , $2j$, $3j$, tearing toward infinity at right angles to the 1, 2, 3 of the natural numbers and the i , $2i$, $3i$ of the imaginaries. She turned round in her chair—

At the end of the number line, in the doorway, stood Roy Kramer. "I, uh . . . you didn't answer the knock."

"No. No, I didn't hear anything."

"Sorry if you're busy. I just wondered if . . . you'd like to have some tea . . . or walk around . . . or whatever."

She'd been hearing tales about The Yank. But maybe they were just tales out of school. Tales out of the world. "Is this really how American pilots knock up young ladies? I'd always heard—"

Kramer's eyes were as big as fists, and by the time he explained the difference of idioms they were out of the hut and embarked upon a serious walk.

" . . . the pay's good, but the real perk is that everybody gets ten days of line time a year—and you can take that squeezed, so you get it and two weeks' vacation both.

"There's a story that some staff saved up their time for five-six years, and finally got Workshop—that's the write-it-yourself line—to set up this incredible Regency fantasy—you know, like those Georgette Heyer books?"

She nodded, recalling *Simon the Coldheart* on her nightstand, with *Principia Mathematica* and her sky atlas and a disorderly heap of notebooks. And a framed pensketch, by one of her father's friends in imitation of John Tenniel, showing Vicky in Wonderland.

"Well . . ." Kramer said, "they spent a month throwing parties and dueling and . . . uh . . ."

"Wenching," Jaynes suggested.



"Right . . . and when they came out, Alternities did some cleanup—I mean, they did a *lot* of cleanup—and opened it as a regular line." He looked at her, and quite suddenly frowned.

"If you're imagining me in laces, Mr. Kramer—"

"No," he said, more softly than she had ever heard him speak. "I was thinking . . . Alternities must seem pretty awful to you . . . with the war on, I mean. What I do."

"No. It doesn't, because—H. G. bloody Wells, isn't that what Tim said, when you landed? Wells wrote a book, rules for a game, called *Little Wars*. The introduction said it was for boys and 'that superior sort of girl who enjoys boys' games'—my father gave it to me, saying 'I hope you aren't considering becoming a footballer.' There was a lovely box of Britains Guardsmen, and a Naval Gun that shot dowels, to play the game . . . but that's not the point, sorry.

"Wells thought what a grand idea it would be to have a . . . 'Temple of War,' he called it, where we could put all the generals and war ministers and arms salesmen, with endless numbers of tin soldiers, and put an end to live ones forever."

Her thoughts were far afield, among ranks of smart tin Guards in bright enamelled uniforms. She felt a sudden flush of content-

ment, of peace, as though the mad world around them had fallen at once into order.

She looked at Kramer, and stopped still at the sight of his face; he was clearly not imagining her in laces. "Mr. Kramer—"

He nodded. "I apologize. I just—I think intelligent women are sexy, okay?"

She burst out laughing, and he turned sharply away. She put a hand on his shoulder, guessing that she was expected to. "I've read a lot of Mr. Wells, Roy. He firmly believed that men and women should—"

Just then, the mad world fell into geometrical perfection. The pattern was very clear, and as simple as falling down stairs. The shock of realization was so strong, so physical, that she nearly did fall; steadying herself against something, she looked up to see if the sky had broken open to stars with the force of the thought alone.

Not yet—not yet. Just a little more to do.

It seemed that she had been doing something, or about to do something, but surely it could not have been as important as this. If it had been, she would have remembered it. There was something under her hand; it made no sound when she let it go. She turned and ran back to her room, knowing that her feet would crush no blade of cold-brittled grass, for she occupied nine different dimensions. She fell upon the pencil and the computer as a starving lioness on food.

And when, farther down the time line, she had the proof of her vision, her epiphany, the world in pencil rushed up to meet her eyes and darkened to nothing.

Dr. Jaynes opened one eye, and saw two black arms that reached for one another but did not quite touch. She pushed up from the desk, feeling great hard crusts in her eyes, tears turned to stones. A sheet of paper stuck briefly to her cheek, then fell away. It was not important, only a universe that might have been. The world that mattered lay before her on the table, just beneath the small shining computer, which said over and over in marching black characters, $F(x)=0$, $F(y)=0$, $F(z)=0$. . . and Mooresy's crude, humming power supply, which worked together with the computer though they came from different worlds entirely.

But that was the way of the universe she had drawn. The universe was two heavy pencilled lines that did not quite touch, the near-contact surrounded by an icosahedral cage, a twenty-sided figure.

She knew the shape of the fog, now, and where the break was in

the line of reality, and—she thought—how to weld it shut.

She sat some while longer, looking at the papers, tracing the patterns the functions made. She even knew why there were twelve doors beneath Roy Kramer's Widow's Walk. Looking up, at the taped window, she could read the stations of the curve in space, black stars in the white sky.

And then reality closed the figure, and the second epiphany revealed itself to her; and she cried out with the pain of it.

"Come on, Roy. Get up. Come on now, wake up."

Kramer's eyes opened, but did not focus. "Wha . . . Vicky?" Reality blurred with the traces of his dream; pleasantly perhaps, but the dream was gone too soon to be sure.

"Kramer, get up. I have it. I have your route away from here."

He woke quickly enough then. She talked on, not seeming to notice that he was dressing in front of her. *Well . . . if she doesn't care . . .*

"Do you see how this line—it's a geodesic, though I know it doesn't look like one—just fails to close? That's us, our time. Time is a geodesic regardless of the number of dimensions, that's what I've found . . . but this means that Time is always under tension, very great tension. So when an imbalance occurs among the other dimensions, Time is the first thing to go. Do you see?"

He saw a smudged graph and a beautiful, puzzling woman. "It's all numbers . . ."

"Of course it's all numbers," she shouted. "*We're* all numbers—a height, a breadth, a depth, a duration, and a few others I haven't named yet. Listen to me, there's not *time*—"

Abruptly Kramer realized that Jaynes was not just running over with whatever it was she had discovered. She was reading her watch, the clock on the wall, the sunless sky, rushing him toward—

She stopped long enough for him to get them to the Mess, tea, coffee, biscuits. He poured. She rattled on.

"When Time . . . fractured, let's say; yes. Time fractured like a bone, and the ends flew apart under the stress; but then normalizing forces acted, like muscles seizing up, to pull it together again. Only it wasn't a single, simple fracture. It was a compound fracture, sticking right through the skin of space into another universe. And there's a piece missing."

"Me."

She nodded. "And the line can't knit . . . Time won't be conserved . . . without that piece." Her face was all twisted up, and from one moment to the next Kramer saw joy and confusion and pain and

always, always urgency.

And he stirred. *Not yet, not yet*, she had said last night, let go of him as if he'd been a dead fish and run for cover. He'd almost chased her, but guessed she didn't want to be chased. She wanted to wait. That was fine with Kramer. He didn't want it to be too easy; he had the patience to learn the rules. He could wait, save it till it drove him like a drug, like it was driving her now.

"What is it?" he said, feeling his heart speed up. "Are we running out of time?"

"Time is *closed*," she said furiously, then shook her head. "Oh—not what you mean. Yes . . . no, we're . . . I mean—is your plane fueled, Roy?"

"Yeah," he said, swallowing a chuckle. They wouldn't make the Mile High Club, but close enough—

"Then here's your course." She unrolled another sheet of paper, weighted it with teacups. "I've laid it over a sketch of the field . . . do you see these altitudes? You must get them precisely. Can your compass do that?"

Kramer looked at her, then at the paper. He read the line, translated it into aerobatics. A turn, a split-S, a vertical climb . . . *Last one to Angels Twenty's a wirehead*. "There isn't much room up there for all this . . . but I think I can hit it, with a few tries."

"Tries?" she said, a squeak.

Kramer stared. None of his instruments were reading right. The controls didn't respond. And the seat of his pants lied like a bastard.

"Don't try. Don't *think*, Roy. Just get in your plane and fly." Her voice was overloaded; when it burned out, the room darkened.

There was a long, quiet pause.

Kramer said, "You really want me out of here, is that it?" He tried to stop the words, but they tumbled on, out of control. "Things got a little warm last night, and now you want the Yank bastard to hie himself hence before he gets you any warmer. Right?"

Kramer didn't feel at all well. He wanted to punch DESTRUCT on his speech—but Jaynes just stood there like British Gibraltar, stiff upper lip and all that rot.

"I loved you, Roy," she said, and Kramer felt that old familiar stab in the chest. *Roy-boy, you did it again . . .*

Or was it that old familiar stab in the back? He said, "If you loved me, you'd—" and his stomach rolled over and dove. What in *hell* made him think he knew the rules without learning them? This was not his culture, his time, his world, his Homeline. He'd forgotten where he was, just like a goddamn paying customer—

"Not that way," she said, and her voice was strong and terribly sad. "I loved you because you took the war away. No more warplanes, or flying bombs, or dead men falling out of the sky . . . we were all sick, Roy, couldn't you see? Sick with a . . . sort of creeping palsy, from being too close to too many young men who go out each day to die and kill. Like the sisters who tend lepers until they catch it too."

That much I understand. "All you mean is that you were beginning to enjoy your work," he said, trying to be gentle with the poor rattled virgin. He knew that feeling, every time he shot a friend down in flames. "It isn't wrong," he lied.

"No," she said, and put him into freefall again. "I could never have loved it . . . but I was beginning not to mind it. And that was worse, not to care.

"But then you gave me a problem I *could* love, and the means to solve it. Just for a little while I've been the greatest mathematician in the world, d'you know? Gauss never had a magic box, nor Poincaré, or Dodgson, or poor Galois. . . .

"Nor did they have a world to find again. And a ghost Squadron." *It's the Squadron leader, he thought. She really has been standing on the Widow's Walk—oh Hell.* "You were trying to bring them back."

"No. Just trying to solve an equation. Two different things. Finally I saw the answer, and I thought . . . I knew I was in love, Roy. With numbers and answers and you. But then—"

He waited. Patience was the only virtue left.

"—I saw what followed the solution."

He gripped her hand, because flesh and bone were real. "What? Please."

"The war," she said, in a tiny voice. "Again. But bigger, so much bigger . . . fought not just with bombs and guns, but with Time." She pulled away. "We shoot at the planes that pick their drowning pilots from the Channel. We wouldn't hesitate to fight them with Time."

Haven't scored at all, have I? he thought bitterly. *I haven't even convinced them what's at stake.* "I never got around to telling you about Dachau, did I? Auschwitz—"

"Don't," she said. "They're just battles long ago to you, but they're my future. The future of everyone here."

"They might be," he said, thinking *I won't not tell you. I'm not that proud.* "The atomic bomb—"

"What?"

"Yeah. A bomb that—"

"Stop. Stop! Stop!" And he did. She spoke in a whisper. "Kramer—my father's in America. Working on an atomic bomb. No one else even *knows*. And if he knew it would *work*—" She shook her head violently. "Roy, won't you please help me let the world alone?"

"Do you know . . . what you're asking? What you're doing? What I can—"

"None of us knows," she said, suddenly cool. "We're all just playing with variables. X equals zero. Pawn takes knight. But pawns never bleed." She looked down, at the paper infinities. Kramer thought irrationally that it was the numbers themselves that were frightening her. She said, "Get in your plane, Roy. Fly away and start the world again. And the war with it."

Kramer folded his hands helplessly. He knew too well what the next move was, and for the first time in his life he wasn't ready to move when the woman was. "You said you loved me."

She turned her head, toward nothing. "I loved a set of undefined variables." She looked at him, cold as the winter fog. "You're going to ask me to come with you, aren't you? Forget it. The sides of the equation have to balance. You're the imbalance. You and your machine." She turned away. "I never let boys play with my toy soldiers. They only broke them."

Kramer nodded. *You learn quick, lady. It's my turn now.* "My dad always told me to stay away from intelligent women. You'll give your variables a goodnight kiss for me, won't you?"

And having drawn as much strength as they could from each other's blood, that was that.

There were, fortunately, enough ground crew awake that no one had to be roused. And the plane was fueled, ready; what else had Kramer had to do except care for it?

Jaynes watched them tow it from the hangar. Kramer gave the crew thumbs-up from the cockpit, then looked directly at her and blew a kiss from his gloved hand. Clutching the graphs close to herself with one hand, she waved—*For luck. No more than luck.*

The cockpit closed. The starter coughed, then caught, and the twin airscrews spun themselves invisible. A mechanic patted one of the plane's tail booms, then stepped clear, and the machine went rolling, bobbing, ungainly as all grounded birds, down the field.

It came by again, a dark green flash that stirred the first breeze since it had landed. Then it seemed to tense—and leaped into the air, wheels folding up, flaps retracting, wing arching over to miss the white wall enclosing them.

Kramer began his bank. Jaynes could hear voices from around the field, doors and windows banging open.

Kramer executed a marvelously graceful split-S, over and down and out perilously near the ground. Then the Lightning gave a fuel-injected grunt, whine of props, whistle of wings, and it was climbing, climbing, joy of flight in light and metal. Jaynes looked up, past the ship's forked tail, the nose with the man within, to the empty sky.

A ring-shaped bit of it turned the color of quicksilver.

Dr. Jaynes looked at the papers in her hands, the numbers that could move worlds and bend time, *quod erat demonstrandum*. Loyd's voice came from somewhere, saying something; she heard her name but made no reply. There would, she knew, be Time enough.

Very carefully, she tore the sheets into bits smaller than her thumbnail, letting them fall straight down through the still air. *There was power, Professor Jaynes. I was careful.*

She could no longer hear engines, people, anything. She stared at the flakes of paper like snow in the grass, waiting for the wind to come and blow them away.



SECOND SOLUTION TO PARALLEL PASTS (from page 53)

Neither Cracker nor Ada thought to check on which calendars England and Spain were using in 1616. England was then still on the old Julian Calendar, but Spain had adopted the reformed Gregorian calendar, which was ten days ahead of the Julian. The two famous writers actually died ten days apart!

Robert Service wrote another poem about the Bard of Avon in which he disclosed a reason, based on the title of one of Shakespeare's plays, for believing that the plays were really written by Francis Bacon. Can you guess what play it is? On page 125 I will answer by quoting the poem's final stanza.