

THE IMMORTALITY OPTION

THE SEQUEL TO
Code of the Lifemaker

JAMES P. HOGAN

PHOENIX PICK

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www.PhoenixPick.com

**www.JamesPHogan.com
The Author's Website**

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INTRODUCTION

Soon after *Code of the Lifemaker* was published, I began receiving requests for a sequel. One of the most persistent was from Owen Lock, at that time Editor in Chief at Del Rey Books and successor to Judy Lynn Del Rey, who had published the first novel. The Prologue of *Code* contained mention of a race of aliens who long ago built the robot factory ship that began the mutated process out of which the peculiar biosphere of replicating machines on Titan had evolved; whose cost accountants ruled their engineers, just as came to pass with humans a million years later; and who conceived an alien counterpart of Murphy with his immutable law. "I want," said Owen, "a sequel story that involves those aliens. They sound interesting." The only problem was, I didn't really want to write one. There were other thoughts going around in my head at the time, and the idea of resurrecting the aliens was besought with major difficulties that I assumed Owen appreciated. But he kept arguing more persuasively in other words, raised the offer until in the end I agreed, still with no real idea of what form the story would take.

One day, after I had signed the contract, Owen and I had lunch in New York. "I reread *Code of the Lifemaker* over the weekend," he informed me. "I'd forgotten. Those aliens all got wiped out a million years ago."

"Owen," I said, "That's what I've been trying to tell you. It makes it kind of difficult to tell a story about them today, doesn't it?"

His reply was, "You're a resourceful writer. I'm sure you'll come up with something." And for the rest of the meal he refused steadfastly to return to the subject.

Now, to me, "sequel" implies a story that follows on from the one before and involves the same characters that the reader has come to know and wants to see more of. That meant it had to revolve around Karl Zambendorf and his crew, the central figures from *Code*, whom we'd left out at Saturn's moon Titan, solidly in the twenty first century. On the other hand it had also to feature the aliens, who were extinct long before humans existed. How to reconcile two such irreconcilables?

I didn't want to resort to a cop out like time travel, which hadn't been anticipated in any way in the first book; nor was I happy with something weak, along the lines of, "Well, actually they weren't all wiped out. . . ." and so on. And lo and behold, a way out suggested itself. As a hint, I'll mention that a major help on this book was Hans Moravec of the Robotics Institute at Carnegie Mellon University. Hans has written a lot on uploading consciousness into computers or other non organic hardware, where it can reside in a dormant state and be resurrected from after a long, long time.

And I'm delighted to see the work being resurrected—although not after quite so long a time—by Arc Manor Books.

James P. Hogan
County Leitrim, Ireland
April, 2010

Prologue

By the second decade of the twenty-first century the nations of Earth, while as prone as ever to the localized squabbings that would probably be a part of the human scene for as long as humanity endured, had receded from the specter of global doomsday that had tied up entire industries of creative talent and stifled vision for over fifty years. After a period of indecision while governments absorbed the new realities and former defense-satiated contractors searched for a new direction, the leading-edge technologies that the years of confrontation had stimulated became the driving force of a revitalized, multinational space program.

An early object for further investigation was Titan, the giant moon of Saturn, perpetually cloaked in high-altitude clouds of red-brown nitrogenous oxides. The first probe to attempt a surface survey was the European *Dauphin*, which arrived in 2018. Data acquired previously from astronomical observations and the probes sent to the outer planets in the 1970s suggested surface conditions close to the triple point of methane, raising the intriguing possibility that it might exist as a gas in the atmosphere and in its liquid and solid phases on the surface, thus playing a role comparable to that of water on Earth. Some scientists speculated that the hidden surface of Titan could consist of methane oceans and water-ice continents covered by nitrogenous hydrocarbon soil precipitated from the upper atmosphere, with methane rain falling from methane clouds formed below the aerosol blanket. It was even possible that radioactive heat released in the interior might maintain reservoirs of water that could escape to the surface as ice “lava” and perhaps provide a fluid substrate for mountain building and other tectonic processes.

And, indeed, radar mapping by the *Dauphin* orbiter revealed vast oceans, islands, continents, and mountains below the all-enveloping clouds, the details of which were published and caused widespread excitement. The public account, however, left out the highly reflective objects—suggestive of huge metallic constructions—which in some cases extended for miles, along with the glimpses of strange machines transmitted back by the *Dauphin's* short-lived surface landers.

The Europeans shared their knowledge of what was presumed to be an advanced alien culture only with the Americans, who at that time were alone in possessing a large, long-range craft in a sufficiently advanced stage of development to follow up on the discovery. This was the pulsed-fusion-driven *Orion*, the development of which had been partly funded by a private consortium centered on the General Space Enterprises Corporation (GSEC) specifically for manned exploration of the outer planets. Launched, crewed, and managed operationally by the newly formed North Atlantic Space Organization (NASO), the *Orion* mission to Titan departed two years later.

In addition to NASO personnel, the mission included scientists from a wide range of disciplines, linguists and psychologists because of the prospect of encountering some form of intelligence, and a force selected from elite American, British, and French military units to afford a measure of protection, since the probable reaction and disposition of that intelligence were unknown. In this age of mass culture the GSEC directors were mindful that any future policy toward Titan that they might consider beneficial to their interests would need strong public support to be viable. Accordingly, at their instigation, the mission also included a major celebrity from a field that the antisience reaction of recent times had endowed with significant public influence, which GSEC hoped to be able to exploit to its advantage: the super-"psychic," Karl Zambendorf. Along with him went the team of assistants that accompanied him everywhere.

What the mission found on Titan was more astonishing than anything that even the most fanciful interpreters of the *Dauphin* data had imagined. Below the cloud cover, Titan was inhabited by a living, evolving biosphere of machines. Sprawling tangles of self-reproducing industrial technology proliferating out of control extended across huge tracts of the surface. And roaming around this mechanical "jungle" were various kinds of freely mobile machines that apparently formed part of a weird yet apparently functional ecology.

The only explanation the bemused Terran scientists could conceive was that it had all somehow mutated from an automated, self-replicating industrial complex set in motion by some alien culture long before. What alien culture? Where were they now? What had gone wrong? Why Titan? Nobody had answers.

But perhaps the most amazing find of all was that this unique form of life had evolved its own bizarre brand of intelligence. The scientists dubbed the beings the Taloids, after an artificially created bronze man in Greek mythology. They were an upright, bipedal species of self-aware robot that wore clothes, tamed and reared mechanical “animals,” grew their houses from pseudo-vegetable cultures, and worshiped a mythical nonmachine machine maker, which they reasoned must have created the first life. They saw the miles of proliferating machinery as “forests” and quarried ice to build their cities. As nearly as could be approximated, the Taloid culture was comparable in its level of progress to Europe’s at the time of the Renaissance; accordingly, the Terrans dubbed the Taloids’ geographic political groupings after the medieval Italian city-states.

In terms of advancement and productive potential, the technology running wild all over Titan surpassed anything that existed on Earth. The backers of the *Orion* mission quickly realized that whoever could gain control of that potential would cease to have any effective competition on Earth, commercially or politically. Therefore, just when the Taloids were beginning to challenge the old feudal tyrannies and experiment with more liberal ways of governing their affairs, the mission’s GSEC-backed leaders adopted an interventionist policy aimed at keeping the traditional rulers in power as local puppets to run the intended neocolony.

Public opinion back on Earth was misled by distorted accounts of what was going on, and for a while the future of the Taloids looked bleak. But then, more by accident than through any deliberate design, Zambendorf and his crew became the instigators of a new “religion” that swept through the Taloid nations, causing them to throw out the old, authoritarian powers and their teachings, and hence to reject the intervention of the powers from Earth that were trying to prop up the old system.

The resulting exposures became the subject of an international scandal, causing GSEC to be relieved of its control and NASO to assume full command of the Titan mission. The GSEC representatives and associates left ignominiously with the *Orion* when the time came for it to return to Earth. Zambendorf and his team, however, remained as part of the

mixed complement of NASO personnel, scientists, and a small military detachment left behind to carry on the work at Titan until the arrival of the newly completed Japanese ship *Shirasagi*, due five months after the *Orion's* departure.

PART I

The Psychic Who Valued Reason

I

According to the computers that provided a rudimentary translation between English and the strings of ultrasonic pulses via which the aliens communicated, the Taloids called it a river. And, indeed, its functions were comparable to those of a river: It flowed through the forest, attracting and sustaining life; it brought nutrients down from distant sources; and it carried away the debris, detritus, and wastes that were inevitable products of life in action.

In reality, the “river” was an immense conveyor line rolling through miles of machines and assembly stations, all thumping, whining, pounding, and buzzing on either side beneath an overhanging canopy of power lines, data cables, ducting, and pipes. The river came from more thinly mechanized regions, forming gradually out of the mergings of lesser transfer lines serving local material-processing centers and clusters of parts-making machines. Farther down it broadened, fed by incoming tributaries bringing ever more complex subassemblies and recycled parts. These flowed onward to fabrication centers lower down, which included the assembly sites for the peculiar machine “animals” and, at a number of specialized locations, for the Taloids themselves. And finally, everything that had not been utilized—components rejected by the sorting machines, substandard assemblies, unwanted pieces and parts picked up by the roving scavenger machines—was consumed in reduction furnaces and recovered as elementary materials for reprocessing.

The waste and inefficiency were enormous. In some places masses of jammed and defunct machinery stood in idle decay, partly dismantled by the scavengers. Piles of nuts, bolts, strands of wire, cuttings, and stampings covered the ground everywhere like a layer of forest humus. Entire

lines of design died out, while others appeared in their place. But amid it all, as with the carbon-chemistry variety of life that had taken possession of distant Earth, the common thread that bound them all together as descendants from the same remote ancestral event managed somehow to sustain itself and endure.

It was like trying to find your way through a General Motors plant in diving gear with the lights out, Dave Crookes thought, perspiring and cursing inside his dome-helmeted extravehicular suit as he clambered over a gap in a line of pumping stations thick with hydraulic-line couplings. The Taloid in the lead—known as Franklin among the Terrans—waited a couple of paces ahead, while Armitage, the military escort assigned to the party, held aside a web of cables hanging like vines from the supports of a rotor housing dimly outlined in the gloom above. The party included an escort more as a matter of form than from any real need for protection against anything. And the troopers were always happy to get away from the base and see something new outside.

The beam from Crookes's flashlamp revealed pipes running across concrete foundations ahead, with steel pillars and a construction going upward. To the left of the construction, cables radiated away from an arrangement of protruding columns of stacked disks that looked like the insulators of a power transformer. On the right, a pile of scrap overflowed from a recessed space beneath the concrete foundation. A spindly six-legged machine that had been rooting with its tapered snout around the base of the pile scampered away into the darkness.

"Watch yourself above, to the right," Armitage's voice warned through the speaker in Crookes's helmet.

There was a piece of pipe sticking out with a valve on the end. "I see it," Crookes acknowledged.

The voice of Leon Keyhoe, the signals specialist accompanying Crookes, came over the circuit. "How much farther to the tower? This is getting to be like an obstacle course across Osaka." Keyhoe had put on weight during the voyage out from Earth with the *Orion*, and he sounded breathless even in Titan's low gravity. Being cooped up in the base at "Genoa" for most of the time since the ship's departure over two months previously hadn't helped matters.

"By my reckoning we should be practically there," Crookes answered.

"*Men!*" Amy Rhodes exclaimed as she followed Crookes over the wall of hydraulics couplings. "Just no spirit of adventure, that's your problem. No wonder it took thousands of years for Earth to get explored." Deign-

ing to step down, she jumped the four feet from the top casing to the steel mesh plates covering the ice below.

Crookes turned away to resume following Armitage and Franklin. Behind Rhodes, Keyhoe heaved himself up and paused to wheeze for a moment before lowering himself down the other side of the obstacle. He was followed by “Charlie Chan,” the Taloid bringing up the rear, so called on account of the golden hue of his metal hands and the facial parts not covered by his rough black hat and clothes of what looked like tire tread and woven wire.

The closest they had been able to land the flyer had been about half a mile back, among the remains of some kind of derelict construction beside the main conveyor line running through the area. The flyer’s two-man NASO crew and the party’s other military escort had remained to guard the craft—necessary, since certain types of Titan’s metal-searching animals had developed a liking for Terran alloys—while the scientific party continued the rest of the way on foot.

The “tower” was in fact little more than a protuberance of girder frames capped by a circular platform, standing thirty feet or so above the general level of the structures in the vicinity. What made it interesting to communications engineers like Crookes and Keyhoe were the shapes on top that pictures from low-flying reconnaissance drones had revealed, suggestive of communications antennas. The pictures were low-resolution infrared, however, which made positive identification difficult, and no actual transmissions had been detected. Hence, the only way to find out for sure what the shapes were had been to go there and look.

If the whole Titan scene was indeed a result of some vast, alien, self-replicating industrial operation gone wrong, as supposed, it seemed likely that it would originally have used radio communication. A number of scattered and intermittent transmission sources existed, seeming to support such a conjecture, and some of the Taloids possessed what appeared to be a residual reception capability by which they could, on occasion, “hear” the transmissions. Traditionally, these latter were considered by the Taloids to be mystics who interpreted voices from the deity.

The prevalent opinion among the Terran scientists was that radio had formed the primary means of communication early on in the alien project but had become impracticable for some reason after the whole scheme messed up. So the system had reverted to the backup communication modes that the aliens would surely have provided if they had been any kind of engineers at all, and the isolated signals still being picked up were simply a remnant of something that was in the process of dying out. Thus,

the scientists reasoned, there ought to be “fossil” radio facilities, recognizable in form but no longer functional, such as antennas, like vestigial limbs, still being built the way they always had been but no longer capable of doing anything. Verification of the prediction would go a long way toward advancing the theory. Hence the expedition to the “tower” in the part of Titan the Terrans called Genoa.

It was all a long way and very different from Denver. Crookes had signed up as one of the mission’s scientists in the aftermath of a divorce to get away and find freedom in totally new surroundings for a while before returning to begin a new life. And he had done so in an unexpected way. On the face of it, “freedom” seemed a strange way to describe life in the confines of Genoa Base, lived according to the strict code of NASO’s offplanet regulations. But the sense in which the word meant more to him was the release from the worldly obligations of bills, mortgages, departmental budgets, and dreary social chores, and the ability to concentrate in the company of his intellectual peers on the mysteries of Titan and the Taloids without distraction. For once in his life it was the job of others to take care of all the necessary things that didn’t interest him, letting him enjoy the things that did—even if that it did entail blundering around in mechanical jungles, encased in a claustrophobic EV suit.

Whatever had stood on the concrete foundation was gone. A line of supports carrying pipes now crossed the area above a pair of rectangular pits, one containing reciprocating machinery driven by gear trains, the other half-filled with a stagnant liquid, probably methane. A pair of thick, vertical stanchions, with a partly solid metal wall filling the space between, rose out of the clutter to support an arrangement of girders and platforms above. Armitage’s hand lamp picked out more braces and structural ties above that. Consultation with a map sketched from the reconnaissance pictures showed that they had reached the tower.

Franklin pointed at the box attached to Crookes’s belt. At the same time a red light on it began flashing, indicating that it was receiving high-frequency Taloid sonic pulses. Crookes unclipped the “transmogripher”—a much improved version of the device he and Keyhoe had improvised after the first Terran-Taloid contact, though the name they had given it then had stuck—and touched a button with a finger of his gauntlet to interrogate. The message on the miniature screen read: okay terran (climb trees?) own back world-place?

Crookes nodded and switched in the channel of his suit radio that was set to the transmogrifier frequency. “Sure. We do it all the time.” The device emitted an inaudible stream that Franklin seemed to understand.

i first lead if is good. taloids (used to/talk with?) forest.

“Fine.”

“Why don’t I go next after Franklin?” Amy Rhodes’s voice said in Crookes’s helmet. Her tone of voice wasn’t so much a suggestion as a demand. Technically, Crookes was in command of the party, and it seemed to rile her; her attitude had been belligerent ever since they had set out. He shrugged inside his suit and made a nonchalant face.

“Sure. Go ahead.” He caught Armitage’s eye behind the face piece of his helmet. The soldier raised his eyebrows and turned away. It wasn’t something that was worth getting into an argument over.

A platform resembling a catwalk spanned the gap between the two stanchions about ten feet above where the group was standing. There was no access ladder, but Franklin reached the platform without much difficulty, climbing first to a run of hoses topping a line of cylindrical tanks, and from there up a series of stays and struts that provided holds. Amy followed, making a show of gliding on her feet and using her hands lightly for balance like a rock climber. Armitage went next, moving solidly and unhurriedly, and then Crookes. After a short delay and more huffing over the intercom circuit, Keyhoe appeared from the shadows below, with Charlie Chan following immediately behind.

They could now see beneath the tower over an incomplete section of the wall. Instead of the derelict lower levels they had expected, they found themselves looking down onto a fast-moving conveyor carrying an assortment of assemblies and components, which from its direction would join the main “river” not far from where the flyer was parked. Whatever installation had once existed in the base of the tower was gone, and a subsequent phase of construction had seen the conveyor run straight through where it had stood, leaving the skeleton of the former structure, with its tower above, straddling the banks like a bridge.

From where they now stood, there was no easy way farther up. The pillars at the right-hand end of the platform supported banks of switch-gear boxes that gave moderately easy access for the next twenty feet or so, but the structure above was stark and bare, with little prospect of much to stand on. The center section held nothing but the support frame for the upper platform, high above them and way out of reach. That left only the pair of I-section girders standing cornerwise to each other at the left-hand end and forming a vertical right-angle channel about three feet wide on each side. Crookes and the others moved to that end and inspected it with probing flashlamp beams. The channel carried runs of heavy cables secured at intervals by fastenings that could, in a pinch, serve

as a makeshift ladder. Awkward but not impossible, Crookes thought. After about thirty feet the channel reached the frame beneath the upper platform, and from there on the rest would be easier. Franklin was already experimenting, driving his straightened steel fingers between the cables like a wedge and walking himself up on his toes until he found a stance.

Hell, this is supposed to be a scientific investigation, not a display of heroics, Crookes thought. One rip in a suit at Titan's surface temperature would be lethal. Why risk it? They could be back with the right equipment in a matter of hours.

Amy seemed to read his mind—or, more likely, the expression through his faceplate. “Oh, I’ll go,” she said in a tone of exaggerated weariness, making it sound as if he were suffering a failure of nerve. “I led the Eiger a couple of years back. This is a cinch. I’ll take a line up that you guys can hook on to.” Armitage’s sigh came heavily over the intercom circuit, but he said nothing.

Dave Crookes reflected later that that would have been the time to settle things. He should have pulled rank right then and declared that they were going back to the flyer, and that was final. The French had a phrase, *esprit de l’escalier*, which could be roughly translated as “staircase wisdom”: the feeling that practically everyone experiences from time to time of belated realization only when halfway down the stairs and on the way out of the building, after the interview is over, of what one *should* have said. Or sometimes it happens ten seconds after putting down the phone.

But the way the situation felt to Crookes at the time was that making an issue out of it would have been overly defensive in just the kind of way the taunt was intended to provoke. Keyhoe was giving him a ready out if he needed one, holding both hands up protectively and shaking his head inside his helmet in a way that said emphatically, “Not me. No way!” But Crookes moved a couple of paces back and swung the beam of his lamp past Franklin, who was already six feet above their heads, and followed the channel upward to pick out the rest of the proposed route.

“It’s what we came here for,” Crookes said, making his voice matter-of-fact. “Okay, Leon can give us some light from down here. Charlie Chan had better stay with him. The rest of us can go take a look.” He looked at Amy and couldn’t resist adding, “Okay, if you want to play mountaineer, you go first.”

Amy uncoiled a line from the gear they had brought with them and treated Crookes and Armitage to a minilecture on safety procedures. Then she set off, bracing a foot on each side of the channel and finding handholds among the cable restraints. The others watched as her legs, her

backside, and the bottom of her pack receded upward in the light from their lamps, with Crookes holding the trailing line clear from obstructions. Then her voice over the intercom announced that she was at the platform and was securing herself. She pulled in the line; Crookes called to let her know when it was taut, and then followed.

There really wasn't a lot to it. The EV gauntlets afforded a good friction hold between the cables in the same way Franklin's Taloid fingers had, and there were more brackets and bolts to stand on than had been visible from below. Macho-jerk men could be a pain, Crookes reflected as he moved upward, falling quickly into a rhythm. But macho-jerk females were worse to deal with. No sense of how much force was appropriate; they went for the throat over trifles.

He joined Amy and Franklin on the upper platform and clipped himself to a loop she had made around a brace. Then Crookes brought up Armitage, who appeared a couple of minutes later, his M-37 slung along the side of his backpack. They stood up and surveyed the surroundings.

The four figures and the parts of the structure immediately around them stood out white in the light of the beams being directed from below. All around, the daytime twilight of Titan—about as bright as a moonlit night on Earth—showed the jungle of metal shapes extending away in every direction, highlighted intermittently in places by bursts of sparks and flashing electric arcs. The platform itself formed a terrace ten feet or so wide around a central superstructure continuing upward to the circular base visible in the reconnaissance pictures, which supported the antennas. The superstructure looked as if it should have been rectangular. However, two of its sides were missing, leaving the terrace on the far side as two narrow strips at right angles forming an exposed corner projecting precariously into space. Girder lattices sloped up to the circular base at an easy angle and would be no problem to climb.

"Well, this is my department," Crookes announced. "Let's see what we've got."

He began picking his way up the nearest lattice, using the cross-trusses as a ladder. Franklin came after him, while Armitage watched from the platform below and provided light. Amy wandered off to explore the far side of the terrace.

A parabolic dish and a helical antenna shared the base with what looked like part of a rhombic array, as well as other forms that Crookes was unable to identify. The first odd thing that struck him was that none of them possessed any electrical connections. They were mechanical assemblies only. Then he noticed that even the mechanical constructions

were incomplete. Parts of the mounting for the parabolic dish, vital to allow it to rotate and elevate, were absent. Instead, the mechanism had been welded, rendering it totally immobile.

He was, indeed, looking at what they had suspected: a collection of fossils. Somewhere long in the past the instructions for making them operable had been lost, but a vestige of the form had remained. Whatever machines had erected this place had followed blindly directions contained in the blueprints passed down, possibly for millions of years, from the unknown origins from which the strange landscape below and all around him had sprung. As he gazed at the shapes, he wondered how long they had stood like this, staring mutely upward, waiting for messages they could never hear. And how many similar generations before them? . . .

Less than a scream, a short, sharp cry of alarm cut through the silence in his helmet. Then, almost in the same instant, he heard Keyhoe's voice from below: "What was that?"

And Armitage: "*Oh, Christ!*"

Crookes moved to the edge of the antenna base and held on to a mast to look down. Armitage was on one of the projecting sides of the terrace, scanning the area below with his lamp, while Franklin stood a few feet away, pointing downward with frantic stabbing motions—it was daylight to the Taloids. The red light on the transmogrifier at Crookes's waist was flashing. There was no sign of Amy. A few seconds later Crookes saw the light of her flashlamp as it was carried away on the conveyor below.

Whether she had slipped or a part of the structure had given way beneath her, nobody ever knew. From the catwalk where he had stayed with Keyhoe, Charlie Chan saw her fall, and he was back down to the floor level and through a gap in the wall to the conveyor line before those above had exchanged another word. But quick as he was, there was no trace of her when he got there. Crookes radioed the crew of the flyer, who switched on floodlights to watch for her at the larger conveyor, but nobody was sure if the tributary joined it upstream from where the flyer had landed, or down.

In any case, they saw nothing.

2

Wearing a maroon robe, with a towel hanging loosely around his neck, and carrying his toilet articles in a plastic bag, Karl Zambendorf came out of the men's shower room in the Terran base on the outskirts of the Taloid city called Genoa and made his way along the corridor leading back to his cabin. The original base, built from prefabricated parts brought by the *Orion*, had been extended since then by the adaptation of materials from Titan itself. With its mesh floors, its utilitarian fittings, and the starkness of its metal walls barely relieved by ubiquitous cream-yellow and lime-green paint, it was cramped, sweaty, smelly, and stuffy; but to those who had been its occupants through the two months since the *Orion's* departure, its oasis of light, warmth, and companionship, in the minus-180°C cold of Titan's cloud-covered darkness 800 million miles from Earth, evoked feelings of fondness and security that only their visions of home itself could match.

Zambendorf's cabin was a standard two-man NASO affair with twin bunks, a small desk with chair and computer terminal, a hand basin and utility worktop, and a toilet through a narrow door at the rear. Otto Abaquaan, who shared it with Zambendorf, was elsewhere. Zambendorf replaced the towel and other things he was carrying and finished dressing.

He was in his early fifties, somewhat portly but with an erect bearing, his graying hair worn collar-length and flowing, bright eyes and hawklike features made all the more patriarchal by a pointed beard that he whitened for effect. austrian psychic picked for naso mission, the headline of one of the prominent East Coast dailies had blared before the mission's departure, while the host of New York's most popular Saturday night talk show had introduced him as "the man who reads minds, foretells

the future, sees without the senses, and makes the impossible happen routinely. The walking enigma that scientists the world over are at a loss to explain.”

The official reason given for including Zambendorf in the mission was that because he was a popular cult figure, his presence would help popularize space and hence advance GSEC’s longer-term interests. The faithful naturally believed that the authorities had at last recognized Zambendorf’s telepathic abilities as genuine, and he was being sent as Earth’s principal ambassador.

In fact, Zambendorf himself hadn’t been sure of the real reason until after the *Orion*’s arrival at Titan. GSEC was interested in the fabulous industrial capacity spread over the moon’s surface. If even a fraction of that potential could be organized and directed to profitable ends, Earthly competition would effectively cease to exist. And it hadn’t taken GSEC long to find support in Washington and the capitals of Europe, where others were quick to note that a commercial monopoly of such dimensions would confer virtual world domination politically as well. But the success of their plan would depend to a large degree on creating favorable public opinion. Zambendorf was a world celebrity with high emotional appeal and hence could influence public opinion. So “owning” Zambendorf—an unlikely eventuality, given his personality and disposition, but that was the way corporate minds thought—and associating him with Titan in the public mind would create a powerful means for steering official policy regarding Titan in whatever direction GSEC might find it expedient to desire. But ironically, Zambendorf and his team had played the biggest part in causing that scheme to come undone.

While Zambendorf was buttoning his shirt, the door opened and Otto Abaquaan came in. He was an Armenian, handsomely lean and swarthy, medium in height, with a droopy mustache, thick eyebrows, and deep, brown liquid eyes that moved lazily but missed nothing.

The two men had met almost twenty years previously in Germany, when Abaquaan had been working a stocks and bonds swindle. Overconfident after three months of easy pickings from wealthy dowagers, he had failed to check out Zambendorf thoroughly enough before selling him a portfolio of phony certificates. Only when Abaquaan’s contact man was arrested and Abaquaan himself was forced to flee the country hours ahead of the police did he discover that Zambendorf had seen through the scam and paid in phony money. But Abaquaan had displayed a masterful style, and after administering the due comeuppance, Zambendorf had tracked him down again later to recruit him as a working partner.

Zambendorf had no word corresponding to “can’t” in his vocabulary and was optimistic about everything; Abaquaan, by contrast, worried. Which was just as well, since somebody had to be realistic about the difficulties inherent in the schemes Zambendorf dreamed up in his enthusiasm and attend to all the details if the schemes were to be made workable. Their opposition of temperaments suited them to each other admirably, and Abaquaan had become the first of the strange mix of individuals who had gravitated into Zambendorf’s orbit over the ensuing years.

Abaquaan propped himself on the chair by the narrow writing desk. “I was talking to one of the troops who were over in Padua,” he said. “It’s beginning to sound as if Arthur’s guys are right—there’s some kind of a fundamentalist revival movement being fanned up over there. The old days were better and all that kind of stuff. There could be more trouble brewing if it catches on.”

“Padua,” situated on the far side of an ice and rock desert from Genoa, where the Terran base was situated, had been the scene of the failed intervention attempt by the mission’s politicians. “Arthur” was the Terrans’ name for the Taloid leader of Genoa. He had evicted the old feudal-style regime and formed a liberal breakaway state before the arrival of the *Orion*, and his followers were the most receptive of all the Taloid nations when it came to comprehending and absorbing the new Terran sciences.

Zambendorf began combing his hair and beard in the mirror above the washbasin. “Oh, something like it was bound to happen sooner or later,” he said airily. “In physics rapid changes in anything invariably give rise to forces that oppose the changes. Social laws are no different. History is full of examples of reactions against change that some people found too sweeping. But it’s all evolution, Otto. You can’t stop it.”

Abaquaan was a pragmatist. Philosophical observations on the nature of evolution were not among the habits that had characterized his life. “Five dollars to a dime says that Henry’s behind it,” he said. “I never believed that he’d just go away. And he won’t have any problem getting backing out there.”

The Terrans had given the Taloids somewhat arbitrary names. “Henry” was the deposed king of Padua, who had gone into exile along with most of the former nobility and high clergy after Zambendorf had accidentally created a new cult of brotherhood and nonviolence that had toppled the official religion.

Zambendorf turned from the mirror and took a red woolen cardigan from a hook on the back of the door. “Oh, I have no doubt that reason will prevail in the end,” he assured Abaquaan. “You know, Otto, I used to be cynical

about the ways of things, too. But it is true that the mellowness of advancing years reveals the world in a more agreeable light. Or maybe it's the new perspective that one acquires of the universe, contemplating Earth from this distance. You really ought to try making the effort to adjust to it. I feel revitalized: able to face the future with complete, unswerving confidence."

Abaquaan had been hearing something like this about once a week for nearly twenty years. It still filled him with the same forebodings. He turned his eyes briefly toward the ceiling. "Confidence, Karl, is what you feel when you don't understand the situation."

Zambendorf heard something like that about a dozen times a week. He picked up his watch from the shelf where he had left it when he had gone to take his shower and checked it as he slipped it back on his wrist. "Anyway, it's about time," he said "Is Drew ready in the mess?"

Abaquaan had returned from checking the situation in the general personnel messroom. "He's there," he confirmed, nodding. "You're all ready to go."

Demonstrations of Zambendorf's powers had become a welcome feature of life at Genoa Base. The scientists were particularly intrigued, and one or two of them were wavering on the verge of becoming believers. This evening a spectacular event had been scheduled to put Zambendorf to the test yet again.

Zambendorf cocked an inquiring eye. "How was the mood out there?" The flippancy of a few moments ago was gone from his voice. "In the circumstances, do you think this might not be the best time for it? We could kill the transmission and set it up again later." He was referring to the news about Amy Rhodes, which had been announced only earlier that day. Hers was the first fatality the mission had suffered. Although nobody had been under any delusions about the risks inherent in an operation involving so much that was previously untried, nevertheless it had come as a shock to all of them when the inevitable eventually happened. It was as if the charmed phase, in which the mission had been protected against the odds, was over and now anything could happen.

But Abaquaan shook his head. "That wasn't the feel I got, Karl. Calling off the show would only make the atmosphere heavier. What they need right now is a distraction. I think you should go ahead."

It was what Zambendorf had hoped. But part of the charisma he had with his team lay in letting them know that he trusted their judgment. He nodded and checked himself in the mirror before moving toward the door. "Then let's see how we do. I do hope that Gerry Massey gets his end of it right."

3

The general personnel messroom was the focal point of off-duty life at Genoa Base. It was about forty feet long and half as wide, with ribbed metal walls painted lime green up to chest height and peach above that. A large mural display screen halfway along one sidewall could be driven locally or hooked into the communications net. An always-open serving counter faced the room from one end, from which one or more white-jacketed NASO chefs dispensed such delicacies as NASO eggs, NASO beans, NASO chicken legs, and dried soups and vegetables reconstituted with recycled NASO water. Three long, scratched plastic-topped tables stretched most of the way to the other end, where there was a smaller counter that served as a bar for twelve hours of every twenty-four. The open area of floor beyond the tables had accommodated performances by the dramatics group and a string quartet as well as providing space for nightly dancing and the Saturday amateur-night cabaret.

Drew West had a clean-cut college look, and he continued keeping his appearance spruce and neat in a relaxed kind of way even after months at Genoa Base, where T-shirts and jeans tended to be the order of the day and even the military had drifted to wearing fatigues most of the time. Today he was in gray slacks and an open-neck white shirt with sleeves turned back to the elbows, sitting at one of the long tables roughly opposite the mural display screen. A mixed gathering of scientists, NASO personnel, and off-duty military types occupied most of the space on the benches around him.

Drew was the team's business manager. He had started out long before as Zambendorf's accountant and then had become his next full-time partner after Abaquaan as each recognized the talent of the other as a

solution to a need that life at the time was failing to supply. West's contribution was a genius for causing money to disappear from places of visibility where it was likely to attract unwelcome attention from taxation and other authorities, while at the same time keeping its earning ability intact. Zambendorf, in return, offered a life of variety and excitement beyond the usual accountant's fare, although even West in his wildest imaginings had never guessed that it might one day lead to traveling almost a billion miles from Earth to find living machinery and a race of intelligent robots. Since those early days he had developed the additional skills that came as part of the graduation to full accomplice. For the Zambendorf phenomenon was, if the truth were known, very much a team affair.

"I'm just the business manager," West said, mustering his most practiced expression of innocence and showing his palms to the dark-haired young woman in an olive tank top sitting opposite him. "I don't know how Karl does any of it. If you say he's a fraud, then okay. A lot of other people think so, too. I just worry about arranging appearances and getting paid. It's a job."

Sharon Beatty worked with Dave Crookes and Leon Keyhoe in the electronics section. She had never understood why Zambendorf was there, and it disturbed her that so many seemingly rational people should take his antics seriously. She had wasted too much of her life being sidetracked by zany beliefs while she was a student, and, with the staggering nature of the recent discoveries on Titan, there were better things to occupy her time. It mystified her that everyone else didn't feel the same way.

"Gerry Massey can duplicate anything that Zambendorf has ever done," she said. It was hardly the first time West had heard this. "And Gerry never claimed to be more than a good conjurer." She directed her words not at West particularly but to the company in general.

Malcolm Wade, a Canadian psychologist and also an incurable Zambendorf believer, answered from the next table. "Mimicking an effect by a conjuring trick doesn't prove that it's a conjuring trick every time. Just because you can produce a rabbit from a hat, it doesn't mean that all rabbits come from hats, does it?"

"If a simple explanation will suffice, there's no justification for invoking a more complex one," Sharon replied tiredly. She didn't know how many times they had been through this. Conversation became repetitive when people were shut up in a place like this—especially with someone like Wade, who continued asking the same questions no matter how often he was given the same answers.

Behind them, Andy Schwartz, captain of one of the *Orion's* surface landers that had been left as part of the transportation pool, was lounging with his back to the wall, flanked by a couple of his flight crew. If Zambendorf really could receive information faster than light, why, he wondered, had nobody ever suggested checking him against long-range radar probing of a selected region of the Asteroid Belt? But he kept the thought to himself. Watching the experts at odds with each other relieved the off-duty boredom, and he figured that Zambendorf was encouraging the spectacle in order to entertain. Letting it all get too serious would have spoiled things.

At the table in front of them a beefy, straw-haired, pink-complexioned NASO sergeant called O'Flynn was talking to Graham Spearman, one of the biologists, over a plate of sausage and fries. "Ye'd think, now, that one way of testin' an ability like that would be by callin' a horse race or one o' the big matches before the results come in on the laser link. And there'd be money to be made from it, too."

"Hmm. And without needing to set up this Massey business at all," Spearman agreed. He was in his late thirties, with thick-rimmed spectacles and a droopy mustache, and he wore a tartan shirt with jeans. Spearman was generally known as amiable and totally apolitical, which meant that practically everyone was able to get along with him.

O'Flynn quaffed from a pint mug of hot, sweet tea and nodded. "Me point, exactly."

"It needs a tuned mind at the other end," Wade chimed in, turning and gesturing with the stem of his pipe. "Massey has the beginnings of real ability, too, you know. He just doesn't realize it himself yet."

"Is this a fact, now?" O'Flynn said.

Harold Mackeson, NASO's British commander of Genoa Base, was present with an aide. A portable communications pad lay on the table in front of them. Mackeson regarded the whole thing as one of the diversions it was part of his job to promote for the good of morale, and he had agreed good-naturedly to oversee the proceedings. Farther along, past the mural screen, Werner Weinerbaum, the mission's chief scientist, sat with a group of his senior specialists, talking loftily about the latest analyses of alien software from what appeared to be one of the control nodes out on Titan's surface. Their manner showed that they were above even acknowledging the existence of this Zambendorf nonsense, let alone having any time to involve themselves in it. For anyone who might be wondering, they just happened to be in the messroom purely coincidentally.

Gerold Massey was a professor of cognitive psychology at the University of Maryland, as well as being an accomplished stage magician. One of his special interests had long been the exposing of fraudulent claims to paranormal powers. Massey was also a personal friend of one of the NASO directors involved in organizing the mission and had been sent with the *Orion* ostensibly as an official psychologist. In reality, he had been there to act as an on-hand observer of what Zambendorf was up to and if necessary to provide a counterforce if whatever stunts GSEC involved him in started going too far.

The impossible had happened, however, when they had become allies in the common cause of preventing the Taloids from being exploited. Called by commitments back home, Massey had left with the *Orion*. But his improbable compromise with Zambendorf had not only endured, but reached the point where Massey was now cooperating in one of Zambendorf's demonstrations. Even Drew West, who was used to the spell that all who came within Zambendorf's range seemed to fall under, felt that Zambendorf had outdone himself this time. Those like Malcolm Wade, of course, took it as evidence of Massey's conversion. In fact, Zambendorf was as good a psychologist as Massey was an illusionist. He had known that any stage magician would have found the prospect of a ruse involving separation over interplanetary distance—unlike anything that had been tried before—irresistible.

"Here he is now," O'Flynn said, looking up as Zambendorf came in through the door midway between the screen and the serving-counter end of the room.

"Ah, right on time," Mackeson said. He surveyed the display on his panel. "We're hooked into the beam from the *Orion*. If Massey was able to respond immediately, his transmission should be coming in any time now." He keyed in some command characters. The large screen on the wall flickered into life with a caption giving the current date and time in the *Orion's* local units, along with a message that read: channel primed and holding.

"If Karl pulls this one off, the drinks are on me tonight," a voice somewhere murmured.

"Wait and see," Malcolm Wade prophesied confidently.

Zambendorf let his gaze drift casually around the room. In the split second while it passed over Drew West, West signaled with the scratching of an eyebrow that nothing untoward or unexpected had occurred while Zambendorf had been away. Zambendorf ambled across to look over Mackeson's shoulder. The screen on the portable panel in front of

Mackeson showed the numbers 53, 17, 7, 68, and 90 in a line across the top. The same numbers had been written in large numerals on a strip of paper fastened to the wall below the room's large mural screen.

The distance to the *Orion* was by now such that the propagation delay for electromagnetic signals was fifty-two minutes. Almost that amount of time ago, Zambendorf had been there in the messroom to try something that one of the communications engineers had dreamed up—or thought he had; Otto Abaquaan was very good at suggestion. In a series of messages exchanged between Titan and the *Orion* the previous day, Massey had agreed to participate.

Less than an hour earlier, five members of the company, chosen by lot, had drawn the numbers randomly from a set of bingo disks shaken in a box. Then Zambendorf, presuming that Massey had prepared himself, had endeavored to transmit the selection to him telepathically. The arrangement agreed on the previous day was that as soon as Massey received the numbers, he would send them back over the communications beam linking to the *Orion* via relay satellites that had been left orbiting Titan. That response would, of course, take fifty-two minutes to reach Titan, even with the instantaneous outward transmission Zambendorf had claimed. Or, to put it another way, if Massey was able to return the numbers after fifty-two minutes or thereabouts, then he must have been aware of them virtually as soon as they were chosen. To kill time while they were waiting, Zambendorf had then announced that he was going back to his quarters to take a shower.

The legend on the large screen changed to connecting, which meant that the message processors at Genoa Base had picked out an incoming packet with the identifier Mackeson had instructed them to watch for. A moment later Massey appeared: fiftyish, his forehead accentuated by a receding hairline, with rugged features setting off a full beard starting to show gray streaks. He was wearing a short-sleeved navy shirt and sitting sideways to the camera at a desk console in what looked like one of the *Orion*'s cabins. As if cued, he swiveled his seat to face the screen more directly and began speaking.

“Well, hello, all you people back there. We’re getting close to Earth now, although to look outside, there isn’t much difference to be seen—the sun’s bigger, and that’s about all. I must say, this old tub that you perhaps remember fondly is bearing up remarkably well . . .” He looked away for a moment. “I see we’re slightly early here. Vernon, why don’t you put that thing down for a moment and come around and say hi to our friends?”

The view on the screen tilted and slid sideways, then came to rest with the view captured from a different angle as whoever had been operating the camera set it down. Seconds later a younger man in his twenties, lithely built and with wavy brown hair, moved into the viewing angle. Everyone in the messroom recognized Vernon Price, Massey's assistant who had accompanied him to Titan. Price grinned and raised a hand.

"Hi, guys. Well, I plan to be splashing around on a Florida beach just a couple of weeks from now. It just tears me up to think of all that science you're doing back there that I'll be missing." Ribald mutterings ran around the company watching on Titan. "Seriously, though, I'll be interested to see how this thing of Gerry and Karl's works out. By the time you see this, everything will be over where we are. So nothing can change whatever has happened."

"We're almost due now, Vernon," Massey interrupted beside him.

Price glanced offscreen, presumably at a clock somewhere. "Oh, right . . . So, I guess, just sit back and enjoy the show, eh?" He disappeared from view. The image on the screen gyrated again, then stabilized to center Massey in the frame. Massey settled himself down in his chair, head against the back and arms draped loosely along the rests.

"Well, if you're on the schedule that we fixed yesterday, something should be due just about now." Massey closed his eyes and exhaled long and audibly. "I'm ready here, making myself relaxed and trying to be as receptive as possible. If nothing strange happens to prevent me, I'll try and give you a commentary of my impressions. Right now there isn't very much to comment on, though. I do feel unusually aware of the depths of space extending away in every direction outside this ship, but that could be purely subjective, of course—" Massey had seemed to be about to say something more, but his brow creased suddenly, apparently in surprise and not a little puzzlement. The atmosphere in the messroom tensed expectantly as everyone watched what had taken place hundreds of millions of miles away almost an hour before.

"What is it, Gerry?" Vernon Price's voice asked from off-camera.

"I'm not sure. I feel more than just aware of the space outside. It's as if part of my mind is reaching out into it . . . being touched by something. My God, I'm getting something! Suddenly I'm flooded with an image of Karl, and yes, the feeling of a number. It's . . . let me see . . ." Massey brought up a hand, touching his fingertips to his brow. "Fifty . . . fifty-three. Is that it?"

Astonished gasps went up among the company gathered in the messroom. Mackeson tapped at the keys on his pad, and a 53 appeared

superimposed in red on the image, high and to the left. Zambendorf watched impassively from behind, while to the side Malcolm Wade emitted satisfied puffs from his pipe. Weinerbaum looked on from the center of his group, disdainful but now silent.

“Yes, and I think I’m getting the next.” On the screen, Massey was sitting forward in his chair, his hand gripping the armrests with the apparent effort of concentrating. He leaned back to stare up at the ceiling and announced, “Seventeen.”

Smiling, Mackeson shook his head in a way that said he couldn’t buy this even if he was unable to explain it. He added 17 to the top of the screen. Sharon Beatty was looking tight-faced. “I guess it’s beers on me,” the voice that had spoken earlier concluded glumly.

Now the screen was showing Massey in close-up. He was frowning and biting his lip and seemed to be having difficulty. “This one’s not coming through very clearly at all . . . No, just a blur, I’m afraid. It has a feel of ‘threeness’ about it—thirteen, maybe, or thirty-something, but I think I have to pass.”

He seemed restless with the next one also, shifting his gaze and looking around as if he half expected the answer to appear on the walls. But just when the audience was convinced that he was about to confess a second failure, still with his head turned toward the back of the cabin, his voice said, “Sixty-eight.” Then he picked up a glass of water from the top of the unit beside him, took a long and evidently much-needed drink, and as he wiped his beard with a hand declared, “And the last one is . . . ninety.” Massey faced the screen fully again and shrugged, showing his empty palms. “Well, there it is. That’s what I got—or thought I did. Right at this moment only you know how well we did. I’ll be curious to find out. Until then, so long from Vernon and myself on board the *Orion*.” The image blanked out, leaving displayed the four numbers and one blank.

Four out of five—a score against odds of millions. Applause and appreciative comments came from all around. Zambendorf remained as he had stood all the way through, acknowledging them only with a faint bow. It was one of his strong beliefs that when events spoke for themselves, it was wisest not to interrupt.

“Well, then?” Wade challenged, looking smugly at Sharon Beatty.

“I’ll have to think about it,” she returned curtly.

“Well, it’s going to have me doing a lot of thinking tonight, that’s for sure,” Graham Spearman told the room, shaking his head.

“It’s gotta be real,” Andy Schwartz said, looking from one to the other of his crewmen for support. “What other way could there be to explain it?” Neither of them could offer an explanation.

“If you will excuse me, I have more important matters to attend to than these antics.” So saying, Weinerbaum rose and conveyed himself aloofly from the room. Most of his retinue of scientists followed. The others left in the room exchanged grins. It was as good a way as any for the mission’s chief scientist to admit that he had no explanation, either.

4

The farming village of Uchal was situated in the border region to the west of the great forests of southern Kroaxia. Its cluster of houses, including the central church and village hall, the headrob's manor next to its private plot of land, and the outlying barns and animal stables, were grown from foundations that had started as artisan-produced seed cultures. The growing walls were trained to merge into enclosed structures, and the doors and windows formed at the same time by pruning and shaping. In the surrounding fields, rows of tube-forming machines and frame welders supplied a steady harvest of basic body parts for a variety of domestic animals, while orchards of crystallization furnaces extruded purified silicon to supply the assembly centers of new robeings as well as animals. The village also kept herds of wheeled glass crushers and three-legged hole tappers, as well as free-range oil siphoners that brought back mixtures to feed the separation columns at the communal dairy.

This prosperity was due in no small part to the remoteness of the district, which generally left it untouched by the wars and squabbles between Kroaxia and the neighboring nations. The attentions of the royal tax collectors were another matter, but even that burden had eased considerably in the course of the last eight bright periods. Eskenderom, the former king of Kroaxia, had fled into exile, along with his court and priests, after the people had rejected their outmoded doctrine of the Lifemaker and adopted the teachings brought by the "Lumian" gods from their world of light beyond the sky. Now the new ruler of Kroaxia, whose name was Nogarech, was changing to ways modeled on those the rebel leader Kleippur had instituted in his breakaway state, Carthogia, which he had proclaimed independent and had defended successfully even before the

Lumians had arrived. In Carthogia no robeing was enslaved to another; all citizens were free to own property and to trade or work for their own profit; the rulers could be dismissed by the people; and knowledge was regarded not as a sacred mystery to be revealed by the Lifemaker's chosen priests but as an understanding that could be gained by anyone through diligent observation, inquiry, and reason.

Thirg was a Kroaxian who now lived in Carthogia. Before the fall of Eskenderom's regime, he had been known in Kroaxia as Asker-of-Forbidden-Questions. He had lived as a recluse in order to pursue his inquiries after truth in peace, without interference from priests and free from the scrutiny of the Holy Prosecutor's informers. Now he was an adviser on philosophy and science to Carthogia's ruler, the former general, Kleippur, outside whose capital city of Menassim the Lumians had erected their camp. Thirg's prime task was to study—and, as far as was possible, adapt for the use of the Carthogians—the awesome knowledge of the Lumians: knowledge that enabled them to ride in huge, wheeled, animallike vehicles that were not alive, to command weapons capable of annihilating whole armies, and to actually rise up into the sky in strange craft that the robeings had at first thought to be dragons.

Thirg had come to Uchal to visit an old friend of his called Brongyd, who in former days had also entertained thoughts that it was wiser not to talk about and had conducted his own unauthorized researches. Brongyd's fascination had always been in trying to understand how it was possible for a suitably arranged combination of nonliving parts to take on the quality that was called life. He had spent hundreds of brights cataloging and classifying the thousands of species of immobile sorters and roaming collectors, the scavengers, metals extractors, plastics strippers, and chip recoverers, trying to piece together the puzzle of intricate, interdependent pathways by which nature recycled its materials as it constantly renewed the living world. He had followed components through miles of forest conveyors and transfer lines and had constructed charts of the merging and branching patterns by which assemblies grew and flowed uncannily to their destinations. And he had dismantled hundreds of dead animals and static machines to trace where their component parts and raw materials had come from. It had amazed him to think that a bearing lining picked out of the undergrowth by a forest browser in Kroaxia might end up twelve brights later in the rotor of a centrifuge on the far side of Carthogia. And now Brongyd was wondering if he need have bothered. For the Lumians, by the sound of things, created life as routinely as Ro-

bia's wagon makers directed the growth of racing bipeds or a noblerob's four-legged carriage.

"So art thou saying 'tis true what I have heard?" Brongyd asked. The surface thermal patterns around his imaging matrices formed flickering whorls of wonder. "The beasts that live yet are not alive, the Lumians *make* in farms created for the purpose?" He and Thirg were standing at the edge of the village, beside the lane leading to the headrob's manor, watching laborers clearing metal shavings from workheads in an adjacent field. Rex, Thirg's mecanine that had journeyed with him to Carthogia and now back into Kroaxia, sat on its haunches a few feet away, sniffing the breeze and occasionally twitching one of its collector horns.

"So it would appear," Thirg affirmed. "And the farms were not cultivated by clearing forests and seeding deserts, but assembled by machines that the Lumians made with other machines, which in turn were shaped by means of simple tools fashioned from metals that they melted out of lifeless rock."

"So on their world *they* made the first machine!" Brongyd concluded.

"They regard it as no more than an elementary craft," Thirg said. "The feats of the armorers in Menassim, who merely cause self-repairing hydrocarbon mail to grow in methanated soils and coax it into assuming robody contours, impress them more."

The vanes around the coolant outlets of Brongyd's lower face ruffled in bemusement as he thought through the implication. Allegedly, the Lumians were composed of glowing jelly that needed to be bathed constantly in hot, corrosive gases inside their flexible casings. Such gases formed the natural atmosphere of the Lumians' home world, which had oceans of liquid ice and was hot enough to melt mercury.

"But the Lumians are formed from organics, even though they be of a kind unknown to us," he finally said. "If there were no machines on Lumia originally, Thirg, then what form of intelligence grew the first Lumians?"

It was the same question, turned upside down, that generations of robing thinkers had asked themselves when they pondered on what had built the first machine. By now Thirg was getting used to thinking from the Lumian viewpoint, where everything happened upside down or inside out. Instead of their offspring being put together naturally at assembly stations that all shared and maintained in common, the Lumians *grew* them individually inside their own bodies, with all kinds of attendant problems when the time came to eject them. They replaced their worn parts in the same way, by assembling them from the inside out of

molecules circulated in fluid solutions—how the molecules knew to attach where was something Thirg had never understood. But things like roadways and bridges for their nonliving “animals” to move on, and the homes they lived in, they assembled laboriously, piece by piece, from the outside. Impossible as such a scheme of things sounded at first mention, from his dealings with the Lumians on behalf of Kleippur, Thirg was getting an idea of how they believed it could all have started.

He replied, “They speak of origins long ago, under conditions far hotter and more violent than exist in Robia, in which chemicals borne in liquids were able to assemble themselves into forms that, though beyond any experience or indeed powers of imagination of ours, acquired that ability to manufacture replicas of their kind which is designated as possessing life. From that life that was not aware, there emerged the aware form of life that was not machine yet could create machines.”

“So this ‘chemical life’ of which you speak was able to appear of itself, out of no life?” Brongyd asked.

“Thus we are assured.”

“And it was the descendants of this chemical life who built the machines on Lumia and have now traveled thence from beyond the heavens?” Brongyd went on. “They are not gods, nor do they have need of any Lifemaker doctrine to render comprehensible the fact of their existence.”

“It seems a failing of robeings to invent fanciful explanations that lie beyond comprehensibility rather than to make the effort of expanding their powers of comprehension,” Thirg replied.

Brongyd frowned at the obvious question that statement left unanswered. “Thus are the Lumian machines and flying beasts explained,” he agreed. “But thou canst not proclaim that in similar fashion did these strange chemical intelligences of which you speak bring forth the life that abounds on Robia. If no Lifemaker created robeing, but it was the mind of robeing that created Lifemaker, whence, then, Thirg, came we?”

Thirg sighed. “Of that even the Lumians confess ignorance,” he admitted. “They conjecture that we, and all the life of Robia, emerged from simpler ancestors, built by another race still and sent hither from a different world whose distance defies even the comprehension of the Lumians. Why to this place, and how many twelve-times-twelves of twelve-brights ago, are questions to which perhaps none, neither Lumian nor robeing, in the remainder of the course of time will ever know the answers.”

Suddenly Rex began gnashing its cutters and sprang to its feet, tense and alert. Thirg and Brongyd stopped talking and looked around, aware now of the sounds of voices and general consternation growing louder.

The villagers nearby had stopped work and were staring, too. Along a track leading from the edge of the forest a double line of armed riders was approaching, followed by a growing crowd of curious, chattering workers and children from the surrounding fields.

The weapons the newcomers bore were mostly a mixture of traditional carbide-edged swords, axes, and lances. In addition, however, some carried the newer “hurlers” developed by Kleippur’s artisans in Carthogia: tubular in form, that used explosive gases to shoot a projectile capable of shattering a slab of ice a finger’s breadth thick at over a hundred paces. The Lumians possessed weapons that seemed to function in the same general way, although capable of operating at speeds that staggered the imagination and with immensely greater power. They could also call down heat darts from the sky that detonated with furnace light, one of which was enough to demolish everything within a circle of forest twenty paces across.

The riders wore cloaks of laminate mail or heavy woven wire over body armor made of acid-resistant and heat-absorbing organics. Their expressions were harsh, and they ignored the shouts from the villagers on either side. At their head was a thick-bodied figure with a red beard of accumulated cupric plating and a grim set to his cooling louvers. Although this was clearly not a military force, he was wearing a Kroaxian army helmet of wheelskin with a plume of bronze threads. The rider beside him carried a pennant with a design that was new to Thirg, of three circles interlinked. Halfway along the column of horserobs was a six-legged cart being drawn by a pair of spring-wheeled tractors, with several figures riding in it. Thirg looked uneasily at Brongyd. They moved to follow the growing throng, Rex staying suspiciously at Thirg’s heel.

In the center of the village the leading riders parted below the steps leading up to the communal hall and drew up into two lines facing outward across the square, while the cart halted in front of them. It was carrying a long bundle, Thirg could now see, wrapped in a sheet of metallic braid and fastened with cord. The way the rest of the riders fanned out to station themselves like guards at the ends of the streets entering from among the surrounding houses added to his rising apprehension. The crowd, which had grown quickly, seemed similarly affected and became subdued. Ol Skaybar, the village headrob, appeared from the direction of the manor house, accompanied by a number of his helpers and lieutenants. They looked bewildered, shaking their heads at one another and gesticulating among themselves. Nobody seemed to know what was happening.

The leader and the standard-bearer dismounted in the space in the center, between the horserobs facing the crowd, and climbed the steps in front of the hall, which was the customary place for addressing gatherings. Two henchmen who had been riding behind followed them. While the leader and the standard-bearer turned to face the crowd, the other two moved behind them and unfurled a banner showing the same three interlinked circles as had appeared on the pennant. They fastened it to the doors of the hall as the leader began speaking.

“My name is Varlech, Avenger-of-Heresies. We have been sent to this place by the defenders of the Lifemaker’s True Faith, who even now are organizing to protect the sacred teachings that have guided Robia for uncounted generations against the blasphemies being spread by the Dark Master’s agent, Kleippur.” Alarmed mutterings broke out anew around the square. Several villagers started to protest but were quelled into silence by threatening gestures from the mounted guard. Varlech continued:

“Kleippur will destroy all that was handed down by your fathers as holy. He will steal away the minds of your children. Even as I speak, robeings in the service of Kleippur take Lumian desecrators into the deepest parts of the forest to violate the assembly shrines that are the very sources of life. Even now, Carthogia’s schools reject the wisdom of ages to disseminate alien falsehoods that deny the existence of Lifemaker Himself.”

Now the assembled crowd was quiet and less sure of itself. Varlech gestured with his arms, turning from one side to the other to take in all of them. “Can you not see what this means, O brothers and sisters of Uchal? Nogarech has been beguiled by the sorcery of these impostors from beyond the sky. He is selling the souls of Kroaxians in return for the temporal power the Lumians can confer upon him for a while. Even as I speak—and this have I seen with my own matrices—Lumian and Carthogian sorcerers conspire in vile experiment to devise methods whereby the life process of Robia shall be perverted to produce aberrant, unnatural forms to satisfy the covetousness of Lumians.

“But . . .” Varlech raised a steel finger in warning. “It shall be only for a while. The Lifemaker will not forget or forgive, for do the Scribing not tell that the transgressors in heresy and blasphemy and those who follow false doctrines shall be consigned to the great reduction furnace? But it is not too late to renounce thy errant ways and return to the path.” He turned to indicate the banner hanging behind him. “There you see united the true power that shall protect thee, spiritual, moral, and temporal: the forces of Lifemaker, clergy, and nobility intertwined as one trinity. This is the message that we have brought.”

As if on cue, several voices among the crowd began shouting.

“He speaks truly. We have strayed!”

“To serve aliens, Kleippur would have us melt?”

“Loyalty to the trinity!”

Thirg leaned close to murmur to Brongyd. “Who are they who call out thus, so promptly?”

Brongyd shook his head. “Strangers here. I know them not.”

“Were they sent ahead secretly by this Avenger to perform thus, think-est thou?”

“Possibly, Thirg. It is possible.”

Nevertheless, some of the villagers were already showing signs of wavering. Ol Skaybar, the headrob, however, was less easily swayed. Followed by Izonok, one of his cousins, who was also the bailiff, and two more of the local officials, he strode up the steps and confronted Varlech in a loud voice.

“I know not what powers have sent thee hither, Reviver-of-Faith-That-Is-Baseless. But an enemy of robeings, Kleippur is not. For I have traveled widely in Carthogia, and *I* have seen. Kleippur is the true servant of his people, not of any Dark Master that inhabits only the unlit recesses of thy own imaginings. The Carthogians live in freedom and dignity, untrammled by priestly superstitions or the terrors visited by inquisitors. Lumian knowledge is truth, for by its power do not Lumians travel hence from distant realms? By Lumian truth do the Carthogians prosper, and Lumian power protects them—”

To the horror of Thirg and the watching villagers, Varlech calmly raised his hurler and fired it at Ol Skaybar’s chest. The headrob staggered backward, his front casing pierced by a jagged hole from which violet sparks poured, and collapsed. A shriek came from one side of the square. Thirg turned his head and saw Ol Skaybar’s wife and several others of his family standing with more guards, who must have brought them from the manor house. But even as the first shouts and screams started coming from the rest of the crowd, Varlech produced a smaller, hand-held hurler and before their eyes dispatched Izonok in similar fashion, while the two villagers who had gone up the steps with them were cut down by Varlech’s other lieutenants.

“*Silence!*” Varlech’s voice lashed around the square like a wagoner’s tractor goad. All pretense of this being an attempt at persuasion vanished. The villagers cowered as riders leveled hurlers to cover them, and the rattle of weapons being unsheathed came from around the square. “Kleippur’s words would render you as helpless and defenseless children

to be delivered to the Lumians. A people worthy to preserve themselves need strength and discipline as were provided by the ways of old." He half turned and pointed scornfully at the four corpses lying at the top of the hall steps. "What use was the power of the Lumians to *them!* . . . And do you imagine that these skybeings themselves are served any better? Do you believe those who tell you that the Lumians are gods? Pah! Fools!" Varlech nodded down to the attendants who had ridden in the cart, and they began uncovering the wrapped bundle. "The Lumians are as mortal as robeings," he told the crowd. "And as subject to the Lifemaker's wrath. Witness the fate of even skybeings who displease Him!"

Varlech pointed. Gasps of awe went up as the attendants uncovered and raised into view a form that was like a robeing yet not robeing, with an outer casing that bent like organically grown polymer and a transparent outer head shaped into a dome. But the dome was shattered, and the grotesque inner head it contained, instead of writhing with the violet radiance that signified Lumian life, was still and cold. An attendant prodded through the outer head with his sword, and all heard the scraping sound it made. The face was as hard and lifeless as a rock lying in the desert. It was the body of a dead Lumian.

Thirg watched in dismay. He knew that the Lumians were not gods, nor had they ever claimed to be. What he was seeing changed nothing that he had previously believed. He had never doubted that mishap could strike Lumians, too, and was bound to, in some form or other, sooner or later. But the effect on others, even if merely confuting what had never been more than a product of their own gullibility, would be very different.

"We have not come here to ask agreement or beg favors," Varlech announced in a loud voice. "The village of Uchal and its surrounding holdings are placed forthwith under the law handed down by the Lifemaker to the protectors of the True Faith. They have directed that a force be formed of Redeeming Avengers to take up arms against the heresy now loose across these lands. Accordingly, it is decreed that in support of this holy mission, a tax of one-sixth of all produce and revenues shall be delivered every four brights. Further, a force consisting of one in six of all males of military age shall be raised to train as fighters with the Redeeming Avengers. And furthermore, the district of Uchal will render such accommodations, supplies, and other support as are deemed necessary to the success of the Redeeming Avengers' mission. To facilitate compliance, an officer of the Redeeming Avengers and a supporting staff will be installed here in place of the treacherous headrob who was in league with the dark powers. But the Lifemaker in his compassion will spare the

others of his kin, who will be taken hence as guarantees of the people of Uchal's good faith."

A number of the Avengers turned out to be Kroaxian priests. When Varlech had finished speaking, they moved with soldiers through the crowd, picking out other individuals they perceived as threats, to be taken away also. These included more of Ol Skaybar's helpers and officials, the village schoolteacher, and two students who had visited Carthogia's university of learning. They took Brongyd, being an independent inquirer after truth like Thirg. But when one of the priests questioned Thirg, Thirg described himself as being an emissary from Menassim, the principal city of Carthogia. The priest seemed less certain what to do with him and sent for Varlech.

Rex snarled, coolant vanes bristling, as the leader approached. One of the Avengers drew back his spear threateningly. "Easy, Rex," Thirg commanded.

Varlech looked Thirg over coldly. "You are one of Kleippur's sorcerers who conspires with the alien impostors?" he inquired.

"I am a seeker of understanding who pursues truth wherever it may lead," Thirg replied.

"You seem to have no respect and precious little fear for one who holds your life as on a balancing edge," Varlech remarked.

Thirg shrugged his shoulder cowlings resignedly. "Whatever action you decide on cannot alter truth. What is true will remain so, indifferent to any wish of yours or mine that it be otherwise and unimpressed by however many we might induce by reason, deceit, or terror to share in our persuasions."

Incomprehension followed by anger flashed in the Avenger leader's eyes. He was evidently a fighter, not a thinker, and for a moment Thirg thought that he was about to be dispatched to join the four lifeless figures at the top of the steps. But then, just as quickly, a cooler but still irritated light prevailed. Possibly it was because Varlech was not disposed to risk an incident that might precipitate a confrontation with the Carthogian military just yet.

"Take him, too," he commanded. "The time will come when such loyalty to Kleippur will fetch a fair ransom."

Thirg and Brongyd were seized roughly and taken to a cellar where the captives were being herded. They remained there for the next half bright while Varlech went about installing the Avengers' overseer for the village and giving directives for its affairs. Then he readied his force again to proceed to the next village. Bound and guarded, with Rex wedged on the

floor between them, Thirg and Brongyd left Uchal with the other captives in a wagon at the center of the column. After all the effort he had gone through to find sanctuary in Carthogia, Thirg wondered dejectedly if the same persecution and harassments he had thought he'd escaped from were about to overtake him again.

S

Earth's news media were sensationalizing about the “intelligent planet” of the future and running endless features, interviews, and articles by overnight experts speculating on the “total responsive environment” already in the making. Accompanied by an illustration showing the world with a face on one hemisphere and part of the other peeled back to reveal a cortex, the cover of the current issue of *Time* proclaimed: mother earth is being given a brain.

Essentially, the hullabaloo was an update on a trend that had been quietly moving forward for many years: the steady integration of all the various industrial, commercial, scientific, educational, and other communications and computing networks into a vast global complex. The key word being pushed to sell the undertaking was “responsiveness.” It didn't mean simply that any information would be instantly available to anyone (suitably authorized) anywhere, or that the act of purchasing a plastic toy in San Diego or a dinner dress in Amsterdam would carry immediate voting power to help determine the next week's production schedules at automated factories in Nicaragua and Taiwan, or that a complaint about a software product typed into a terminal in Vancouver could find its way onto the agenda of a management meeting held two days later in Tokyo. But all the social problems that had remained to plague humanity despite successive ages of enlightenment, industrialization, affluence, high technology, and the various “other solutions” that had been promised would finally disappear as the true cause of all the ills—society's indifference and consequent unresponsiveness—was made good by worldwide automated “electronic sensitivity.”

“Electronic communism, more like it,” Burton Ramelson grumbled at the others gathered in the library of his family’s mansion in Delaware. “Central planning all over again, wearing a new disguise. They’re saying that the theory was sound all along, but the reason it collapsed back in the eighties was too-long delays in communications. Now they’re wiring up the planet with a faster nervous system, and that’s supposed to fix it.”

Actually, Ramelson didn’t have any special objection to the notion of centralized control, so long as he and those who owed allegiance to him ranked influentially enough with the controllers. But the pattern was changing. Since the last quarter of the twentieth century, prosperous corporations in Japan and eastern Asia had been acquiring controlling interests in most Western industries, making them direct, on-line subordinates to the places where the real powers were concentrating. It so happened that the Ramelson family was the leading stockholder in a diversity of industrial and financial enterprises that included General Space Enterprises Corporation. And the only direction left pointing away from Earth’s shifting power structure and all the attendant inconveniences was *out*.

“It occurred to some of us, as soon as the *Orion* mission revealed the situation on Titan, that if even a part of the productive potential out there could be turned to useful ends, we could have an answer to the whole problem,” Ramelson said.

He was small in stature, almost bald, and sparse of frame inside his maroon dinner jacket, worn over a silk dress shirt that was open with a cravat at the neck. But his sharp eyes and tight, determined jaw as he spoke, standing with his back to the fireplace, were sufficient to make his the dominant presence in the room.

“In capacity alone, properly organized, Titan could dwarf the output of all the nations of Earth put together,” he went on. “In addition, there are technologies up and running that scientists here are only beginning to dabble in, as well as others that are completely new . . . Greg?” Ramelson nodded at GSEC’s chief executive officer to elaborate.

Gregory Buhl, stockily built, with a craggy face and curly hair that still preserved its dark color, looked up from sipping a brandy in one of the leather-upholstered fireside chairs. “For one thing, they’ve identified working nuclear bulk transmutation: conversion of elements on an industrial scale—the alchemist’s dream. There’s fusion-based materials processing, with all the energy you dreamed of tapped off as a by-product. What we’re talking about here is totally obsoleting primary metals extraction, materials flow processing, every kind of chemical processing: oil fuels,

plastics, lubricants, fertilizers . . ." He threw out a hand. "Self-replicating learning systems, holotronic brains, all methods of forming and fabrication, total waste recycling—as Burton says, get it properly organized and you could obsolete just about everything back here as totally as steam and electricity obsoleted waterwheels and windmills." Which, as everyone present understood, meant turning everything between Kamchatka and Karachi that had been causing them problems effectively into junk.

The others present were Robert Fairley, a nephew of Ramelson, who sat on the board of a New York investment bank affiliated to GSEC; George Issel, senior publishing partner of the *New York Times*; and Brenda Jaye, an executive with NBC. People who bothered to think about such matters often wondered how it was that all the various news media seemed to work themselves up into the same frenzy—whether it was over some crime that had been commonplace for centuries, rapture at another rediscovered formula for living, or hysteria over this month's doomsday-imminent scenario—invariably using the same words and phrases, all at the same time. Whichever way the public turned, it found itself inundated by the same chorus being chanted in unison from an industry that had once been renowned for its healthy and vigorous diversity of opinion on anything.

The reason was that a central committee of representatives from all the major networks and press groups met periodically to update an *Index to Correct Opinion* giving guidelines to the approved slant on all persons and subjects of any note, which was then circulated to the newsrooms. The process operated subtly. No actual directive for conformity was ever issued, but as observers of the system quickly noted, dissenters and mavericks tended not to do so well in the promotion and career stakes. The next review meeting was due in a couple of days, which was why Ramelson had called the group together.

He made a pained parody of a smile. "I assume that you don't wish to be reminded of how attempts were made to shape events on Titan by direct intervention and failed."

Brenda Jaye made a sign for him to halt for a moment. "I've heard the rumors but never made it my business to ask," she said. "Are you saying that the GSEC people and their politicians on the mission *did* try to bribe one of the Taloid states into becoming a client, and it backfired?"

"A couple of people went over the bounds on their own authority," Ramelson replied. "Maybe something to do with the isolation out there affected them. It wasn't authorized policy." It was a flat lie, but Ramelson wasn't about to go on record as admitting anything else.

Robert Fairley broached the point at issue from where he was standing, hands in his pants pockets, by the bookshelves to one side of the fireplace. "But nevertheless, the episode has left the public suspicious of anything that might smack of deliberate intervention. There are still enormous potential benefits to be reaped from Titan. But for the reasons that Burton has just alluded to, being seen to initiate any involvement is precluded. Intervention could come about only as a result of our responding passively to the pressures of events."

George Issel had been around a little longer than Brenda and read this as code for "We need to be perceived as being dragged into it involuntarily." And of course, the classic way of being drawn into complications was by responding to threats that endangered one's kind or one's interests, or at least were believed to.

"Such as incidents that might require action by our security forces there," he murmured, as if he were figuring it out for the first time in his life.

"It is a hostile and totally unknown environment," Ramelson pointed out, "inhabited by alien machines of completely unknown history and disposition. Who knows what might happen?"

Brenda Jaye looked from one to the other as the message sank in. Naturally, any action that might prove necessary would sit more easily with a public prepared in advance to accept the idea that unfortunate things might happen.

"Stress the nonhuman," she pronounced, noting it in the pad resting on her knee. "Minds not comparable to our own. Complex alien response programming, devoid of genuine feelings. Tiny group of humans surrounded by unknowns. Play up professionalism of military constantly on guard." She looked up.

"A splendid assessment," Ramelson agreed, beaming. "My own sentiments entirely." Issel nodded to himself, satisfied. Nothing more needed to be said. Brenda had passed muster as a full member of the club.

Ramelson had been assured that whatever else the superficial arrangement with NASO said, the first loyalty of Colonel Short, the U.S. Special Forces commander of the military unit on Titan, was to sympathetic departments of the Pentagon underworld. And when the right opportunity arose, Short would know what to do. His officers apparently were old hands at this kind of thing.

6

Clarissa Eidstadt took care of Zambendorf's publicity and related matters. Her function was a vital one. The Zambendorf sensation was a product of the image-making industry the public relied on for the reality substitutes that protected its myths. But the public mind was fickle; unless continually refreshed, the images faded rapidly from TV-conditioned attention spans. So when the team returned from an overseas tour, Clarissa always had an angle that would bring a camera team to the airport or hotel for the occasion. If a computer happened to crash while Zambendorf was in the vicinity, or a security alarm went off, or an automatic vendor malfunctioned, Clarissa would make sure that at least one headline to the effect of zambendorf accidentally wipes memchip—halts city bank would appear the next morning. Not a week went by without a showing of Zambendorf performing at a celebrity dinner, a Zambendorf stunt on a previous night's talk show, or, if Zambendorf hadn't done anything newsworthy that particular week, a recycled account of how an expert of this kind or that kind had "acknowledged the reality of the Zambendorf effect" when denying one of the popular claims or had been "unable to offer an answer" in the event of ignoring it.

Clarissa was middle-aged, short, and matronly, with dark hair cut in a straight fringe across her forehead, her eyes framed by heavy-rimmed butterfly glasses and her mouth accentuated by deep red lipstick that she continued to use in Genoa Base's unlikely environment. Her chief weapons for getting what she wanted were scorn and provocation: either goading people that they didn't have the ability to deliver, or exasperating them to the point where they would agree to virtually anything to be left in peace. And over the years it had proved a fearsomely effective formula.

Sergeant Bill Harvey, one of the Special Forces detail left as part of the military contingent at Genoa Base, knew her well enough by now and grinned as she waved a hand disparagingly from the chair on the far side of the steel desk in the guardroom of the main perimeter gatehouse.

“Why ‘Great’ Britain?” she demanded. “What’s so great about it? We put them in their place over two hundred years ago.” Harvey had spent a year attached to the British counterterrorist Special Air Service regiment, and the conversation had drifted into matters concerning the mother country.

“You don’t understand, Clarissa,” Harvey said. “That was intentional. They shipped all their crazies that they could do without over to us, cut the connection, and left us stuck with them. Then they went out and took over the world and had a great time.”

“Says who?”

Harvey eyed her curiously across the desk for a few seconds, then relented. “Not really. It has to do with their geography.”

“Their geography?” Clarissa repeated. “‘Great?’” She gave him a fish-eyed look through her butterfly glasses. “What are you talking about? You could get the whole of it into one corner of Texas.”

“Sure could. It’d do wonders for the place, too.”

“So what’s great about it?” Clarissa asked again.

“It’s like greater New York. England and Wales were originally Britain, see. Then, when they added Scotland, it became Great Britain.”

The huge black man in a white T-shirt and khaki drill pants who was leaning against the wall by the arms rack nodded. He was Joe Fellburg, Zambendorf’s security man. “There’s another part as well, right? That piece up at the top of Ireland.”

“Northern Ireland,” Harvey said, nodding. “That gives you the United Kingdom. Then, if you add the rest of Ireland, that’s the British Isles. It’s all very simple, really.” As duty officer of the watch, he was kitted out in an EV suit minus helmet and pack, which were stowed in the locker next to the outside-access chamber door. Two French paratroopers were smoking and talking over mugs of coffee at a table in the rear, by the door leading to the interior of the base.

“Do you know, Drew was talking about this the other day, and he got it all wrong,” Clarissa said. She pulled a pad toward her that was lying on Harvey’s desk. It was a standard-issue NASO pad, with pages ruled and numbered and the NASO emblem printed at the top of each. “I wanna write this down. Is it okay if I use this?”

Harvey shrugged and waved a hand. “Sure. Go ahead.”

Clarissa uncapped a pen. "I want to make sure I've got it right. Now, how did all that go again?"

People soon learned that nothing concerning Zambendorf was ever quite what it seemed. This was particularly true of the strange mixture of individuals who had attached themselves to him in the course of time, almost as if the unconventionality of the world he moved in somehow catered to a need for zaniness that their former lifestyles had been incapable of satisfying. Clarissa had been not just a pilot but a combat instructor with the Air Force's suborbital bomb wing. Fellburg had worked in earlier years as a communications specialist in industry and later with military intelligence but had come to the conclusion that there was more money to be made—along with more prestige and social recognition to be enjoyed—from the magical vibrations of psychic fields than from the electrical modulations of real ones. He had missed some aspects of the life nevertheless, and he enjoyed having military people around him again at Genoa Base.

So, naturally, there was more to their just happening to be in the guardhouse at this particular time than mere socializing or taking an idle moment to relive former camaraderie. The scientists who had witnessed Zambendorf's "projection" to Gerry Massey aboard the *Orion* several days before had been discussing the feat ever since, and Zambendorf's guess was that they were close to figuring out how he and Massey had done it. In fact, about half an hour before, Thelma, the team's blond, glamorous, curvaceous, and leggy secretary—who also had a Ph.D. in mathematical physics—had called Zambendorf to warn him that a group of them were in the general messroom and had been asking where he was in order to confront him with their conclusions. One of Zambendorf's strengths lay in never letting an opportunity go by. Far from finding such a prospect daunting, he had seen it as a chance to set up a further performance that they would not be able to explain—which would also serve to divert their attention if their answer to the Massey stunt turned out to be correct. Accordingly, after a quick consultation, he had dispatched Clarissa and Fellburg to the main guardhouse to prepare the ground.

Clarissa had never talked about the peculiarities of British geography to Drew West or to anybody else. She had simply seized on the topic of the moment as a pretext for using the NASO pad on the guardroom desk.

"Is Mike Mason around anywhere here, Bill?" Fellburg asked Harvey, distracting his attention just as Clarissa finished writing. "He's got a couple maps that we wanted to borrow."

“Haven’t seen him all morning. Some of the guys are out on a training mission. I think he’s with them.” While Harvey was speaking, Clarissa tore from the pad not only the sheet she had written on, but the one underneath it as well.

“Do you have a map of this side of Genoa that I could get a copy of?” Fellburg asked.

“I’ve got one that covers from here to Arthur’s place and the junkyard on the other side of it that the Ts think is a park,” Harvey said. “That be okay?”

Fellburg nodded and straightened up from the wall. “Just what I need.”

Clarissa rose from the chair by the desk. “Well, I’ve got things to do. I’ll leave you two at it. Talk to you later, Billy.”

“Tell Drew to visit someday, and we’ll talk more about Britain and the rest if he’s interested,” Harvey tossed after her as she moved toward the door.

“I’ll tell him.” Clarissa left.

She met Zambendorf by a storeroom at the back of the vehicles maintenance workshop a few minutes later and gave him the blank sheet from the pad, which carried the number immediately preceding that of the next unused page. “Joe’s there,” she confirmed. Zambendorf nodded and tucked the sheet of paper inside one of several magazines he was carrying. Then he left her and made his way to the general personnel messroom.

Thelma was near the door, ostensibly watching a game of pinochle between some NASO technicians and off-duty military people, when Zambendorf ambled in and casually handed her the magazines he had been carrying. She took them without making any comment that could have drawn unwanted attention. “Did Joe find you, Karl? He was looking for you,” she said.

“No, I haven’t seen him. Well, I’m sure he won’t stray too far in this place.”

“Ah, just the man we’ve been waiting for!” Graham Spearman’s voice called from among a group clustered halfway along the center table. Zambendorf turned as if noticing them for the first time. In fact, he had registered practically everyone present within moments of entering. John Webster, a genetics specialist from a bioengineering firm in England, was with Spearman, along with Sharon Beatty, the professional skeptic, and several more from the computing and communications section. There were some academics Zambendorf recognized as geologists, a clima-

tologist, and various engineering-ologists. O'Flynn was there with more NASO techs, and to the side was a trio of base administrative staff.

"Why? What have I done now?" Zambendorf asked, moving over to join them. The attention in the room followed him and shifted away from Thelma, who remained standing by the card players.

"That show of yours the other day with Gerry Massey," Takumi Kahito, one of the programmers, said. "We think we know how you did it."

"But I've already told you how I did it," Zambendorf answered. "Surely you're not saying you didn't believe me."

Kahito smiled and gestured at the large mural screen. "Mind if we rerun the video?"

Zambendorf shrugged. "Go ahead." In the background Thelma drifted to the back of the room. Everyone present had as good as forgotten that she existed.

"All it proves is that closed minds are capable of explaining away anything," Malcolm Wade declared, puffing his pipe near the serving counter.

Sitting by Wade was the round-faced, wispy-haired figure of Dr.—of what was obscure—Osmond Periera, wearing a rose-colored shirt under a V-neck fawn sweater. The author profiles in his best-selling books on paranormal research and UFOlogy—which claimed, among other things, that the North Polar Sea was a gigantic crater caused by the crash of an antimatter-powered alien spacecraft, and that television altered the climate via mind power concentrated through mass suggestion—described him as Zambendorf's discoverer and mentor. Certainly he was one of the staunchest disciples, and the boosting of Zambendorf's career from European nightclub performer to celebrity of worldwide acclaim owed no small part to Periera's contacts and the influence his royalties were able to attract.

"There's no question that it demonstrates how much more reliably psychocommunicative signals propagate in the outer planetary void, free from disruptive terrestrial influences," Periera said, ostensibly to Wade but so that everyone could hear. "Of course, it doesn't come as any great surprise to anyone of genuine scientific impartiality. The effect was predicted by Bell's inequality many decades ago."

Periera's ability to invent the most outrageous explanations for Zambendorf's feats never ceased to amaze even Zambendorf. None of the scientists at Genoa Base took Periera seriously, but either tolerated him as part of the much-needed entertainment or ignored him with disdain, depending on their disposition. Periera, of course, took himself very seriously and read their attitudes as a direct, inverse measure of open-mindedness.

Conspicuously absent, Zambendorf noted, were Weinerbaum and his coterie of “serious” scientists, who were above sharing in the fun the regular messroom gatherings generated. Harold Mackeson, the base commander, who had presided the last time, was not present either.

By now the mural screen was showing Massey relaxing back in his chair, as they had seen him at the time of the live transmission from the *Orion*.

“What is it, Gerry?” Vernon Price’s voice asked again.

“I’m not sure. I feel more than just aware of the space outside,” Massey replied. “It’s as if part of my mind is reaching out into it . . . being touched by something. My God, I’m getting something! Suddenly I’m flooded with an image of Karl, and yes, the feeling of a number.” Zambendorf continued staring fixedly from where he was standing, aware but not showing it of the curious glances being sent in his direction from around the room. Massey continued, “It’s . . . let me see . . .” His hand came up, touching the fingers to his brow. “Fifty . . . fifty-three.”

“*There!*” Spearman stabbed at the comm unit on the table in front of him to freeze the image. “See—Massey’s hand is covering his mouth. We heard the number over the audio all right, but you don’t actually *see* him say it.” Spearman fast-forwarded the sequence to the next number Massey had gotten right, which they heard him giving as seventeen. But again, at the moment of uttering it he was looking up at the ceiling with his arms braced on the rests of his chair and could have been saying anything. Massey had failed on the next, which had been seven, and Spearman went on to the last two. Freezing the view at 68 showed Massey with the back of his head to the camera, and when giving the last, 90, he had been wiping his mouth after taking a sip of water.

“All four of them, Karl?” Spearman smiled wryly and shook his head. “Too much of a coincidence. I’ll believe that what we’re *looking at* came in from the *Orion* when it said it did—no question of that. But what we *heard* is a different matter. There isn’t one instance where you can actually synch anything to lip movements, no *evidence* that Massey ever actually received anything. All we *know* is that he said he did.”

“Then where did those numbers come from?” Zambendorf asked.

“Prerecorded and mixed in as a voice-over after the signal packet came in from the *Orion*,” Kahito replied.

Zambendorf was impressed. “Not a bad effort at all,” he said, his eyes twinkling. “If it were true, I’d even go as far as to say that you’re learning something about being real scientists at last.” In fact, it had been just as Spearman had said. Massey had sent a recitation, in his own voice, of all

the numbers up to a hundred as part of the messages he had exchanged with Zambendorf the day before the demonstration. Joe Fellburg had persuaded a pal on the NASO communications staff to give him access to the incoming message processors, and he had keyed the appropriate selections to slot into the audio track at the blind spots during the fifty-two-minute wait for the signal from the *Orion* to come in.

Spearman backed the recording up to the third number, 7, the one Massey had passed on. "This one's not coming through very clearly at all," Massey said on the screen. "No, just a blur, I'm afraid. It has a feel of 'threeness' about it—thirteen, maybe, or thirty-something . . ."

"That was a neat touch, Karl. I've got to hand it to you," Spearman said. "This time it is real. All the time that Gerry was talking about this stuff, you could see his mouth clearly. It leaves you believing that the same was true with all the other numbers, too, but it wasn't. I had to run through this a dozen times before I spotted the difference."

All of it was true. The other part about this particular detail was that for some strange psychological reason nobody really understood, people in general were much more likely to find a demonstration of this kind believable when it didn't go a hundred percent right. Conjuring tricks worked every time, the inverted logic of these judgments seemed to say; therefore, if it didn't work every time, it couldn't be a trick.

"What clinched it for me was having the choice restricted to numbers," John Webster said, leaning back. Evidently, as far as he was concerned, the whole matter was already wrapped up, with no call for further questions.

"Really?" Zambendorf just smiled and waited for the opportunity to ripen. He had weathered worse than this many a time before.

"It makes it easy for them to have been prerecorded," Spearman explained. "But suppose that instead of a number you'd used something selected arbitrarily on the spur of the moment—say, an object produced in the room."

"Oh, I see." Zambendorf nodded, as if that should have occurred to him before. "That would have convinced you, would it?"

"It would have convinced me," Kahito said. "If somebody had been free to say, oh . . ." He looked around, then pointed at Spearman's spectacles. "Black-rimmed glasses, or anything they liked, and then it had come in from Massey fifty-two minutes later, sure, *then* I'd believe it."

"I've seen Karl do that several times," Wade assured everybody. Their conviction, however, evidently fell somewhere short of total.

"We'd have had you cold, Karl," Spearman said to Zambendorf.

“Nonsense,” Zambendorf answered breezily. “I’ll do it for you right now, if you like.”

Nobody had been prepared for that. They looked at each other uncertainly, as if to check what they thought they had just heard. “What?” Spearman said. “I’m not sure I follow. How can you do it right now?”

“Massey isn’t set up or anything,” Webster pointed out.

Zambendorf turned up his hands as if asking what the problem was with that. “So set him up again,” he said. He was comfortably sure that they wouldn’t. It would mean taking another day to exchange preparatory messages, making the slot assignments in the communications trunk beam, then getting everybody together again when the response from Massey was due.

“It’s all a bit messy now,” Webster said. “A pity somebody didn’t think of it before.” The others concurred glumly.

“There is another way,” Zambendorf told them after a moment of apparent thought. “You all know Joe Fellburg, right? Well, he isn’t with us just to handle security, you know. I only accept colleagues into the team who show unusual talent in their own right. Isn’t that so, Osmond?”

“Absolutely,” Periera confirmed from beside Wade, flattered at having his credentials endorsed publicly. “An extraordinary collection of individuals. Fellburg does possess an unusual sensitivity for receiving telepathic images. I’ve seen Karl transmit to him in an absolutely sealed room. Checked it myself. It’s quite unexplainable by any purely physical process.”

By this time the fact that only a few minutes previously the Massey performance had been as good as solved was lost in the minds of most of those present. And that was exactly how Zambendorf wanted things to be. The goalposts had shifted; now *this* would be the test of his authenticity.

Spearman looked around the company, then back at Zambendorf. “I’m not sure I know what we’re talking about,” he said. “How is this supposed to work?”

“Very simply,” Zambendorf replied. “We call Joe—” He turned toward where Wade and Periera were sitting. “Does anyone know where he is?” They returned negative gestures and head shakings. Zambendorf shrugged. “Well, he’ll be easy enough to locate.” He looked back at Spearman. “You call him and tell him what we want to do, and if he agrees, you hang up—so there’s no open line or other channel back to him. Then anyone here who wants to can pick whatever objects they like—purely arbitrarily, which was the way you told me it ought to be done a few minutes ago—and I’ll send the images to him.” Zambendorf shrugged again as if

he were describing something he did every day. “And then he’ll come here and tell us what they were.”

“What? With Zambendorf here in the room?” Sharon Beatty put in. “These people have codes that you can’t even see. They can signal to each other.”

“Ask Joe to write them down before he comes in,” Zambendorf suggested.

Nobody could find any objection to that. There was a short debate to consider additional details, until finally a procedure was agreed on that all were happy with. Somebody passed Spearman a seefone from the shelf by the door, and he began calling around the base to locate Fellburg. Zambendorf settled himself down at the central one of the messroom’s three long tables. Fellburg turned out to be in the guardroom of the main gatehouse. “Putting him on,” Sergeant Harvey, the current watch officer, said.

“Er, I hope this isn’t an inconvenient time, but we were hoping that you might help us out with something, Joe,” Graham Spearman said when Fellburg’s features appeared on the screen.

“If I can. What’s your problem?”

“I’m in the messroom with a bunch of people, and Karl’s with us. He’s saying that—”

“Just ask him if he feels able to receive remote images,” Zambendorf whispered in his ear to keep things short.

“Are you up to receiving remote images right now?” Spearman repeated.

“Why not?, Let’s give it a whirl.”

“Without the phone connection.”

“Okay.”

“We want you to write them down and bring the list straight to the messroom to compare with a checklist that we’ll be making. Nobody leaves here till you show up,” Spearman said.

“Anything else?”

“That’s about it.”

“Let’s go, then,” Fellburg said, and the screen went blank. It left a mood of surprise hanging in the air. Somehow this was all too simple and more straightforward than anyone had imagined. Zambendorf waited, looking at ease.

“We didn’t tell Fellburg how many items there’d be,” somebody said.

“He’ll know,” Zambendorf predicted confidently.

As had been agreed, people from all over the room produced items from pockets, purses, and about their persons and passed them to Spearman, who arranged them in a circle covering the width of the center

table. He then placed a table knife inside the circle and set it rotating horizontally. The knife spun through several revolutions, slowing and becoming more wobbly until it lurched to rest pointing at a gold signet ring. O'Flynn, the NASO maintenance sergeant, turned the top card of a deck that had been shuffled by several people. "Eight," he announced. The rule was that if the number was odd, the object would be accepted; if even, it would be ignored, and the procedure repeated. Spearman spun the knife again. This time it selected an American Express card from somebody's wallet. Flynn turned over the three of clubs.

"AmEx gold card," Spearman pronounced. Webster wrote it down as the first item on his checklist. Everyone stared at Zambendorf, who had closed his eyes and was sitting with a distant expression on his face, his arms resting on the table in front of him.

After several seconds he opened his eyes. "Very well. Next?"

The knife picked out a paper clip and a pencil stub, both of which had to be discarded because the corresponding cards were a ten and a two. But the next was the five of hearts, which allowed a brown leather button to be added to the list.

There followed a red pocket notebook, a plastic sachet containing a medication patch, an electrical cable running down the wall of the room—the knife had stopped midway between two of the objects on the table—a jeweler's eyeglass, and finally the person of Takumi Kahito, described on the list as "male of Oriental appearance."

By this time practically everyone in the room had been drawn into the circle of curious watchers around the center table. A few remained here and there, obstinately continuing with their chess games or buried in a newspaper, and Wade and Periera had remained seated, but nobody paid any attention to them. And neither was anyone paying any attention to Thelma, out of sight at the back of the room, quietly writing down the selections as they were announced on the NASO notepad sheet that had been inside the magazine Zambendorf had handed her when he had come into the room. Nobody would recollect that seemingly insignificant event. In fact, nobody would even be able to recall *if* Thelma had been anywhere near Zambendorf from the time he had first appeared.

So when Zambendorf announced that he could feel the receiver's power "fading" (they had agreed on a time limit so that Fellburg knew how long to wait), Thelma already had the complete list written out—penned in a strong, distinctly masculine style—and ready in the room. And with Zambendorf chattering and answering questions at the center table, nobody took any notice when she moved to the serving counter to get herself

a soda and then wandered back along the other side of the room to be only a matter of feet from the doorway when Fellburg arrived. This would be the most crucial moment of the whole exploit.

Fellburg appeared with a wide grin on his face and a folded sheet of paper in one hand, pausing for a second to assess the situation in the room. He saw Zambendorf and began moving toward him, at the same time raising the hand holding the paper. At that instant Thelma stepped forward in front of him.

“No. Karl shouldn’t touch it.” She took the paper, turned with it, and walked a few steps to where Spearman and the others were sitting. In the process, her body hid the paper for a split second, but her movement was so smooth that there wasn’t one person watching to whom it even occurred that the folded piece of paper that she passed to Spearman might not have been the one they saw her take from Fellburg. And so, of course, the two lists were found to match. No amount of speculating about hidden lip movements or prerecorded voice-overs could account for *that*. And that confused the other issue, which by rights should by then have been put to rest, somehow leaving the impression that the Massey demonstration was still an open case too.

John Webster stared down at Fellburg’s list, clearly unwilling to accept what it meant, though just as obviously flummoxed as to what to make of it. Finally he looked up. “Joe, can I ask you something?” He held up the sheet, which had the NASO emblem printed at the top. “You were in the main gatehouse when we located you, right?”

“Right.”

“So was that where you got this paper?”

Fellburg frowned as if having to think back. “Yeah, that’s right. There was a pad on Harvey’s desk back there.” The others in the room looked at Webster curiously.

“There’s just one more thing I’d like to try.” So saying, Webster used the seefone to call the gatehouse again. Harvey’s face and shoulders appeared, showing the top of a military shirt.

“Main gate, Sergeant Harvey. Hi, John,” he greeted.

“I believe that Joe Fellburg was with you not long ago,” Webster said.

“Yeah, right. I think he went to the general mess.”

“I know—he’s with us here. But I wonder if you’d do something for us. Tell me, is there a NASO notepad on the desk there—regular sort, lined pages. NASO whatsit at the top?”

Harvey looked around, then stretched out an arm. “You mean like this?” He held up a pad.

“Did Joe use it for anything when he was there?”

“As a matter of fact, he did. He went off in a corner with it for a few minutes, but I’m not sure what for. Why?”

“Oh, just something we’re curious about. Could you tell me, what’s the number of the next available page there, on the top?”

“It’s, let’s see . . .” Harvey turned the pad around and looked down at it. “Thirty-seven.”

Webster stared at the sheet in his hand. The number printed in large black numerals in the top right-hand corner was 36.