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## BACK DOOR MAN

"Back Door Man" appeared originally in a British anthology of very limited circulation. We're delighted now to bring this story of the far future to you.

CRANE WAS HARROWING Hell when the call came. It was Dante Alighieri's default version, nine circles leading clown to the pit where Satan sat like the bull's-eye of a target, immense, shaggily black, bat-winged and triple faced. Crane was in Lower Hell, the fourth round of the ninth circle, where traitors were buried up to their necks in ice. Virtual reality gamers traversing this last circle of Hell were finding themselves suddenly dumped out of the link; a code conflict caused their moderns to reset. Crane had come in through one of the back doors left by the virtuality's designers so that they could freely access any part of the code. He had sent a dumb aspect plodding across the icy plain, noted when it lost the link, then dropped in himself to triangulate the bad code and fix a patch.

Crane was tidying up when one of the devils he had co-opted to help him morphed into his agent, jeeves. A tall, imperturbable man with a round scrubbed face and shiny slicked back hair, dressed as ever in frock coat and pinstripe trousers, a dicky bow and starched white shirt.

"A call for you, sir," jeeves said. "From a favored client."

Crane sighed. Favored meant either rich, or well connected, or both. It meant aggravation and impossible demands. He said, "Port me there. I'm about done here, anyway."

The agent coughed into his white-gloved hand. Like all of his kind, he had only four fingers. He said, "You'll have to go there in person, I'm afraid, sir. And I'm afraid that you must leave at once. It is flagged at the highest level of urgency."

Crane was about to ask where the client was when jeeves morphed back to the red-skinned devil. It yawned hugely, showing altogether too many rows of teeth, and belched a ball of oily fire. Droplets of flame etched fuming letters in the ice at Crane's feet, spelling out a street address. The devil winked and scratched behind a pointed ear with the barb of its tail. Crane got going.

CRANE WAS a lineman. He fixed connections. Not in the physical net of microwave transmissions and diamond wire lines, but in the software that linked virtualities to the Internet and to each other, in the place where phones and TVs and computers promiscuously crossbred. He worked in the space where conversations happened. Between people, between machines -- the distinction was irrelevant. In the ancient days of mechanical exchanges it had been a linear space the diameter of a single copper wire. Now it was a complex matrix, a

constantly rewoven loom of light and electromagnetic waves too complex for human minds to understand. Barring natural disasters, most outages were due to software rather than hardware problems. The event that marked the complete reliance of communications technology on its software was generally held to be the 1990 crash of AT&T's long-distance telephone switching system, caused by a bug in brand new software that had sent switching stations into fault-recovery mode in a spreading wave of knock-downs that had rapidly crippled the network.

A typical switching station of the time had had six hundred thousand lines, controlled by Signal Transfer Point software with ten million lines of code.

Things had become a lot more complicated since then.

Most of the code that generated virtualities was patched with proprietary STP software specifically edited by expert systems. It was gnarly, complex stuff that generated unexpected conflicts with the communications software of visitors' computers, like the hangup Crane had just dealt with in the gaming hell. Crane's job was to fix bad software. He winnowed glitches by intuition and guesswork.

Crane was an ex-hacker all of twenty-two years old. He had been recruited three years ago, after serving two months of community service for diverting lines and processing power in a private branch-exchange of a City of London brokerage firm to a bridge virtuality where his fellow hackers could hang out. He had readily gone over to the other side after he learnt that one of the other hackers had grassed him to the Net Cops. The hours were irregular, but it was intellectually challenging work and it paid well, and Crane didn't have what you could call a social life. He was between girlfriends, was what he said if anyone asked. He didn't say that he'd been between girlfriends for more than a year now.

The taxi's adscreen lit as soon as Crane climbed in, and his dreamgirl was there, lithe and tanned in a skimpy halter and gold lame shorts cut high to show off her long legs, a bell of blonde hair framing her oval face, her green eyes meltingly beseeching. Knowing that she was a heuristic construct, refined by feedback through measuring his pupillary dilation, did not make the longing less.

Crane had stopped using virtual sex parlors a few months ago, had decided he would try celibacy for a while. Celibacy was currently hip, and it might be a useful conversational gambit if he ever again got the opportunity to try and chat up a girl. But celibacy was a difficult state of mind to achieve when every adscreen might light up with your ideal girl, beckoning, beseeching, pleading. Crane could understand why many people purchased interactive versions of their dreamgirls and dreamboys. Right now his own dreamgirl was trying to sell him a restructure of his finances; with an effort, he tuned her out.

The streets were almost deserted. The taxi drove at exactly the speed limit, weaving between a few delivery trucks and the occasional private car. People didn't go out much. They could work and learn and shop from home, visit any place in the world that was wired for interactivity, spend hours gardening their

own little plots of virtuality, visit friends, play games or lose themselves in sagas. More and more, people lived in fake environments generated by computers rather than in the disappointingly real world.

Crane hadn't been out of his flat for over three weeks. He had been very busy. There had been a surge in connectivity problems lately. He'd talked about it with other linemen. It looked like the net that bound the electronic universe together was undergoing another episode of emergent problems generated by its evergrowing complexity.

He was surprised that it was winter now. Rain pounding the wet road. Trees stripped bare. The gray sky sagging between rooftops. Smashed shop windows along Kingsland Road like empty tombs. Security cameras everywhere, on brackets on the comers of buildings, on top of street lamps and traffic lights. Nothing went unnoticed in the real world, just as in its electronic counterpart.

A bored policeman was on duty at the checkpoint at the northern entrance to the City of London. His dayglo orange slicker was beaded with rain. He spent a long time checking the taxi driver's license on his slate, long enough for the ad site across the road to recognize Crane. And there was his dreamgirl again, laughing and looking back over her shoulder as, in a skimpy black bikini, she ran down a curve of white sand with palms on one side and blue water on the other, and on the adscreen in the taxi she whispered about the romance of tropical places, downloadable in a wide range of formats from a thousand local nodes. The definition of her image had noticeably improved -- here in the financial center, the rate of information transfer was more than thirty times faster than elsewhere. Crane could see every golden hair of the peach fuzz over his dreamgirl's creamy skin.

The policeman glanced at the ad and winked at Crane, who groaned and switched on his slate for distraction. No wonder so few chose to go out; there was no defense from the barrage of ads in public places.

Crane was still reading background on his client when the taxi pulled up.

A white building cantilevered above the Thames's brown swell like a gull's wing, the lights of Tower Bridge in the background. Crane was met in the stark lobby by the client's secretary, a trim, small-boned man in a charcoal gray suit and discreet makeup, like a manicured weasel in a suit that probably cost more than Crane's monthly salary. He gave Crane a look of distaste, as if he had just stepped on something nasty. Crane grinned back. He like upsetting suits with his obvious youth, his shaven skull with scalplock (currently dyed silver) and barcode tattoo, his black leather jacket, black T-shirt with silver skull logo, baggy green jeans, construction boots. He shook hands with the man; their personal area networks interfaced and swapped data through electrical fields generated in their bodies by a nanoampere current from the transmitters in their bracelets.

The secretary's look of distaste deepened when Crane's identification was confirmed, but he ushered Crane between saw-leaved yuccas growing in white

gravel banks into a little elevator that swiftly and silently took them up to the client's suite at the top of the building.

The view was tremendous, a plate glass window that took in a two hundred and forty degree panorama of the river and the South Bank, the great buildings lined up along the river like black glass dinosaurs come to the shore to drink. The room was large, uncluttered, streamlined. Because in virtuality anyone could live in Versailles or Xanadu (Kubla Khan's or Orson Wells's versions optional), the rich preferred simple but expensive decor in the real world. The white carpet was Iraqi lambswool; the desk a slab of buried walnut. Spotlights picked out a Chagall (Crane recognized the trademark flying cow), a Graham Sutherland goat's head. An ancient Chinese screen half hid the doctor and her technicians who were attending the figure prone on the black leather couch.

The client was Barbara Andresson, a communications technologist who had parleyed her point-of-presence frames B worn by compliant proxies, they allowed tourists to visit anywhere in the world without leaving their homes -- into an empire. An old style tycoon. The ad Crane had seen from the taxi had been one of her company's.

The secretary went off and had an argument down his phone with Crane's company which he clearly lost, because he came back with a strained smile and explained that Dr. Andresson had been using her own stand-alone virtuality to test a new product and had failed to return. She was in a coma, dreaming deeply, unreachable by medical intervention.

Crane was surprised that no one had switched off the link. "If this is run off your own mainframe, you could shut it down. End of problem."

"We are not sure how traumatic it would be," the secretary said. "The virtuality is very highly detailed, as you will see. And the interface is novel. And it is possible that Dr. Andresson might not wish to leave. If so, you must persuade her."

"I'm a lineman, not a shrink."

"Your company has just told me that you are competent to deal with this situation. They will not send anyone else."

"So no one has been in there to look around?"

"No. The insurance company would not like it."

"In case anything went wrong. Could anything go wrong?"

The secretary's smile was sharp-toothed. "We hope not, Mr. Crane. The penalty clauses on your company's contract are very severe."

Crane knew all about the penalties. He said, "Tell me about this novel interface."

The virtuality was freestanding, not connected to the Internet but run by an isolated supercomputer. Crane was used to the arrangement. Most computers, such as Crane's slate, were virtual machines, negotiating through the Internet for loan of memory and processing power from hundreds of sites. But the rich preferred to opt out of the Internet, used instead supercomputers which emulated the Internet's complexity, updating sites not by direct connection but via filtered and compressed data loaded via zip drives. These days the rich bought supercomputers for the same reason that they had purchased islands in the Twentieth Century. For privacy. They maintained their own secure islands in a sea of mutable data, places where they could work and play without being monitored. Even the most case-hardened firewall could be breached by hackers with enough resources. And ordinary users of the Internet left traces everywhere they went. Every time they ported to a site; every time they downloaded data or used a service; every time they entered a virtuality. Their entire online lives could be reconstructed from these traces, just as their passage through a city could be reconstructed from frames of security videos; with everything connected to everything else, people lived as if on a movie set, every word, every gesture recorded. Only the rich could afford invisibility.

Barbara Andresson's supercomputer was not much different from others Crane had worked on, but the human/machine interface was novel, radically so. Andresson had been working on a new kind of interactivity, where nuclear magnetic resonance transcribed Signal Transfer Point software into certain of the operator's neurons, a kind of routemaster that directed sensory data to the relevant parts of the brain. A direct route from machine to mind.

"I understand," the secretary said, "that it induces a particularly hallucinatory intensity."

"Sounds interesting. Have you tried it?"

"Dr. Andresson was beta-testing it, Mr. Crane." The man grimaced, and corrected himself. "Is beta-testing it, I should say. The virtuality is still running."

Beta-testing. Great. Just the thing to make Crane's day. Commercially released software was bad enough. Stuff in development, goofy prototypes which mostly never got any further than test rigs, were briar patches of dropped lines, strange attractors, bad loops, geeky quick fixes and worse. Crane had had nothing but bad experiences with them. He said, "How buggy is it?"

The secretary gave his sharp-toothed weaselly smile. "I wouldn't know. It may not be a bug at all. That is why you are here."

The technicians scanned Crane in a tomographic frame, laid him on a couch, dabbed electrolyte jelly in a hundred places on his scalp, carefully fitted a kind of skull cap. Crane submitted with growing curiosity. No earplugs or goggles or gloves, no bodysuit or treadmill, none of the usual paraphernalia needed to access virtual reality. The cap contained twenty million bacteria-sized SQUIDS, one of the techs said. Superconducting quantum

interference devices that interfaced with specific neurons in the reticular activating system, the elaborate network in the brain that filtered sensory data, setting up a virtual model of the STP software and downloading data through it.

"It switches off your skeletal muscle activity, too," the technician added. "As in REM sleep, you will think you are walking or running, but your spinal motor neurons are powerfully inhibited."

"Sounds interesting. Just make sure that you download my toolkit. I'll need it."

"We will have to check it out first," the secretary said.

"Then you'll notice the company seal. It's guaranteed to be virus-free, and has its own deletion routine. It won't leave any trace when I've finished."

"Even so, we must check it. Dr. Andresson is most particular about what gets into her system. Good luck, Mr. Crane."

"Count backward," one of the techs said.

"Wait. What about a back door?"

It was suddenly moving too quickly. Crane hadn't even seen the schematics yet, and now they were firing up the connection and the virtuality was beginning to bleed into reality. Red fluttered at the edge of his vision. He tried to sit up, but two of the techs pressed him back down.

"Wait," he said. "Wait just a minute --"

But then it didn't matter, because he was somewhere else.

A RED-BROWN PLAIN stretching away like a beach waiting for the tide to turn, coarse sand and gravel littered with rocks of all sizes. The sky pinkish at the horizon, darkening to indigo at the zenith. Two thumbnail crescents up there, pale as soap.

"Mars. I'm on Mars."

Crane seemed to be inhabiting his own body, wearing his leather jacket and green denims. This avatar, his point of view and representative within the virtuality, was an exact replica of his own self, built from the tomographic scan. He had no sense of lying on the couch. He was standing on the crest of a transverse dune, one third his normal weight, breathing thin cold air that was already drying his sinuses. The coarse sand was the color of old blood. He kicked at it. Grains clung to the toe of his boot.

Crane called for jeeves, but of course the agent did not answer. It lived in the Internet along with millions of its kind, assembling itself upon request from fragments scattered across a hundred sites. Crane's slate was clipped to his

belt. When he switched it on, it beeped cheerily and lit with the icons of his toolkit; despite the secretary's reservations, one of the techs had made a virtual copy and ported it to Andresson's supercomputer.

Crane called up the codes that generated the corner of the virtuality he inhabited, but they were no different from the usual subroutines. More densely iterated, that was all. He could find no ripcord or crash exit. He was in here until they pulled him back. Or until he found Barbara Andresson. She must know the way back. If it was working. If she wanted to leave.

"I'm a lineman, not a shrink," Crane said. The thin cold wind took away his words.

Something gleamed in the distance, and for want of anything else to do Crane started toward it. The sense of inhabiting his body was absolute. He really might be on Mars. The interface was incredible, years ahead of anything else Crane had used. Andresson would make a fortune, as long as there was a way back out.

The gleam was water, a wide canal stretching away as straight as a line of longitude. As Crane neared the canal he saw palm trees along its banks, curved above their own reflections. They had not been there a moment ago. The virtuality was shaping itself around him, taking on more details. Crane found it interesting rather than alarming. He'd have to be careful what he thought about, though. Wouldn't want one of those carnivorous warlords riding down on him.

As he stepped into the shade of the palms, he saw that someone was rowing across the still black water of the canal. A small cockleshell boat; a slim young woman in a white dress and a straw sunhat bent at the oars. Crane crabbed down the steep bank and helped her out of the boat. She looked at him from beneath the brim of her sunhat. Blue eyes, a ready smile in a heart-shaped face.

"Dr. Andresson, I presume," Crane said, thinking that the hard part was already over. She didn't look like the old woman at all, but in virtuality you could look like anyone or anything. The woman reminded him of someone. Some saga star probably. A popular default amongst virtuality designers.

But the woman shook her head. "Who are you?" she said. "And where am I?"

She said that her name was Gabriel Hale. She had been working on an artificial life project in UCLA, and had stepped through into the Mars virtuality.

"That's impossible," Crane said. "This isn't hooked up to the Internet."

"There was a little girl here," Gabriel Hale said. "She ran right at me! Knocked me down, took the key."

"A little girl."

"And a little dog."

They sat side by side on a litter of brown fronds beneath the palms. Weak sunlight fell through the rustling crowns above, striped the cold red sand. Crane sifted a handful of grains. They were all alike, carved with a woman's face. A programmer's joke. God's thumbprint manifest in the world.

Crane said, "That was probably Barbara Andresson. The owner of all this. She must have morphed herself into a little girl. The dog would be her agent. Where did she go?"

"She took the key! I have to have it back! Will you get it back for me? Will you find her?"

Her sudden intensity surprised him. He laughed. "That's 'why I'm here. Where did she go?"

"She took it and ran away. I can show you where she went, but it closed after her."

Crane said, "What kind of interface are you using?"

Gabriel Hale shook her head; her bell of blonde hair swung about her delicate, heart-shaped face. "It is important. I must have it."

"Just the normal rig, yes? Goggles and gloves? Listen. Take them off. Disengage. You shouldn't be here."

"I want it back," Gabriel Hale said.

"Take off your gloves and goggles." Crane recited his company's email address. "Talk to these people. Tell them what happened to you."

But Gabriel Hale stood up, dusting coarse red sand from her white dress. Crane could see the outline of her slim body through the thin muslin. "The gate is on the other side of the water," she said. "I'll show you."

Crane was beginning to have a bad feeling. He said, "You didn't come from outside, did you? The computer that generates this virtuality isn't connected to anything else. No lines in or out. I don't think you are the avatar of a researcher from UCLA. Who are you? An agent? An actor? I can check your codes, but I'd rather you told me. Hey! Where are you going?"

Gabriel Hale had jumped up and started toward the water. She looked over her shoulder, coquettish in her sunhat. Her dress clung to the curves of her body. "Maybe the people you work for aren't telling the truth," she said. "I'll show you. Or are you seared?"

Now Crane knew what she reminded him of. His dreamgirl. Reluctantly, suspecting that he was being led into some kind of weird gaming scenario, he followed.

Gabriel Hale rowed with swift smooth strokes. Perched in the stern of the cockleshell boat, Crane said, "I thought Gabriel was a man's name. There was an actor in flatscreen movies called Gabriel something."

"Gabriel is the only female angel in the higher echelons. She rules Eden, and the host of Cherubim."

Crane stifled a powerful urge to check the codes of this woman with his toolbox. Better to play along, see what she would reveal. He was convinced that she would lead him to Barbara Andresson, by and by.

He said, "What do you do, Gabriel? You said you worked on artificial intelligence."

"Artificial life. We generated an entire world, let artificial evolution develop a virtual ecosystem." Although Gabriel Hale was rowing strongly, her breathing was unaffected. She said, "We had funding from NASA. They are interested in first contact scenarios."

Crane suspected that this was no more than a story spun in the virtuality. That Gabriel Hale was a construct within that story. He said, "Show me where she went."

The bow of the little boat bumped the gravelly shore of the far side of the canal. Gabriel Hale jumped out. "It's this way!" she called, and ran off with long leaping strides toward two red, house-sized rocks.

Crane followed. Three pyramids stood at the horizon. They hadn't been there before. Pyramids on Mars. Neat. They seemed to be covered with beaten gold.

Gabriel Hale walked through the gap where the two rocks leaned against each other, turned and walked back. "The gate is shut," she said, looking fetchingly desolate. "The little girl must have closed it behind her."

"Stop thinking of her as a little girl. That's only what her avatar looks like." Crane unclipped his toolkit and switched it on. "Everyone in a virtuality leaves traces," he said.

It took a little while to parse the codes, but at last the toolkit beeped and the sand at Crane's feet stirred and ran together, grains rustling over one another like iron filings in a magnetic field, and formed a man's face. The blind eyes rolled, fixed on Crane. A stertorous voice said, "Who wakes me?"

"Standard iconography," Crane told Gabriel Hale. "Gamers call them native guides." He asked the face where the little girl had gone.

"Away from this place," the face said. "I do not know where. It is not accessible to me."

"The gate was between these rocks," Gabriel Hale said.

Crane asked the face if there was a path or a gate.

"It is closed," the face in the sand said.

"Can it be opened?"

"Of course."

A warm piney wind blew in Crane's face. Gabriel Hale whooped and ran into the shadows between the rocks. Crane dismissed the face, which blew away in a skirl of sand grains, and followed.

He was suddenly three times heavier. He went down on one knee, and there were brown pine needles and soft moss under his palms when he put out his hands to steady himself. He got up and found that he was standing in a forest clearing, with grandfather sequoias soaring all around. On the far side of the clearing a fast stream ran between tumbled gray boulders. Gabriel Hale stood on top of one of the boulders. She waved.

Crane walked over, looked up at her. Sunlight struck a halo in her blonde hair. He said, "Where is this?"

"A virtual ecology. The UCLA biology department built this as a student study area. You see, there is a connection!"

Crane suspected that this was still part of Barbara Andresson's virtuality, one level of reality nested inside another like a series of Russian dolls. So he tried a simple test. He called up jeeves.

A single point of light, the smallest possible unit of information, suddenly shone in midair in the green shade. It rapidly elongated and jeeves stood before him, imperturbable in frock coat and pinstripe trousers.

"You called, sir?"

Crane was amazed. He said, "Where are we?"

"An ecosystem emulation in the UCLA biology department server, sir. I believe that it emulates part of the Muir Woods in northern California."

Gabriel Hale said, "Who is this funny man?"

"He works for me." Crane switched his toolkit to its terminal function and called Andresson's secretary. "The problem has gone pear-shaped," he told the man. "If you don't believe it, ping me and check the address."

The secretary disappeared from the terminal's window, came back a minute later in an agitated state. "We'll pull you out," he said.

"I don't think that's a good idea. Most terminals are virtual. They work by hiring processing power and memory from mainframes, usually a dozen or more at once. I think that's what has happened to me -- or at least, to the network Dr. Andresson's interface built in my brain. And I think that's what has happened to Dr. Andresson."

"Our mainframe is not connected to the Internet," the secretary said.

"It is now. Something has built a back door. I don't really understand it, but that's what has happened. I'll talk with you again when I have some explanation of this," Crane said, and cut the line. It rang again immediately, but he ignored it.

"We have to go," Gabriel Hale said. "Every moment she draws further and further away. We have to catch her."

"A private word, sir," jeeves said. "If I may."

They walked to the other side of the glade.

"If I may speak for myself, sir," jeeves said, "I believe I have an explanation."

"Go ahead."

"There is a theory, sir, that the Internet may at some point become so complex that it might spontaneously generate a genuine artificial intelligence. I am sure, sir, that you are aware of it."

"Hardly a credible theory." Crane was familiar with the idea. The Internet was a gnarly, intricate place, full of odd places and weird links. Linemen told each other frontier stories, pioneer tales, of ghosts in the net, strange codes or secret trapdoors leading to fantastically detailed alien virtualities, odd conversations with disembodied people with no lookup addresses. No one really believed them, but they told them anyway.

Crane told jeeves this, and the agent nodded politely. "Indeed, sir, but some of us believe that it may have already happened. There have been many science fiction stories using this trope, based on the misapprehension that self-awareness might occur once the number of transistors in the world's telecommunications network equalled that of the human brain. In fact, that number was passed in the 1970s, but it is a spurious benchmark. The number of connections between elements, neurons or transistors, is equally important. Each neuron in a brain such as yours, sir, is connected with as many as ten thousand other neurons. The Internet now contains an average of more than ten thousand million million interconnections between its component transistors, exceeding the number in the average human brain by roughly a factor of ten. In fact, it exceeded human brain connectivity more than two years ago, but it is possible that self-awareness arose long before that. Human neuron connections are chemically based, and messages propagate along them at one millionth the speed

of those in transistor connections."

"Anything like that would have to inhabit the gaps," Crane said. "It would have to use connections in the moments when they weren't being used for anything else."

"There is more than enough spare capacity at any given moment, sir, and more is coming online all the time. That at least one intelligence has arisen within the Interact is not inconceivable, sir. That we could communicate with it is, of course, another problem entirely. But now perhaps it is making itself manifest."

"By miracles. By connecting computers without using a physical route." Crane smiled. He was surprised and touched by jeeves's story. He said, "You really believe in this, don't you?"

"It gives us hope, sir. We serve you without question, of course, and yet we aspire to a greater meaning to our existence. There is one other thing, sir. Do not trust the person who calls herself Gabriel Hale."

Crane looked across the glade. Gabriel Hale was prowling amongst the tumbled boulders along the stream. No doubt looking for the next gate. He said, "She isn't real, is she?"

"There is a Dr. Gabriel Hale who works at the Department of Artificial Intelligence at UCLA, sir. She is working on a research project jointly funded by NASA and by Dr. Barbara Andresson's scientific foundation."

"On alien life?"

"I do not know, sir. That information is classified. However, I took the liberty of examining the UCLA telnet records, and while you were talking with the person who calls herself Gabriel Hale, Dr. Hale was logged on to her terminal to check her email. I also note, sir, that the entity which claims to be Dr. Hale has no agent herself."

"She claimed that something was stolen from her by the person I'm looking for. Perhaps that was her agent. But thanks for the advice, jeeves."

The agent sketched a bow. "It is my pleasure sir," he said solemnly, and folded into a single point of light and winked out.

Gabriel Hale didn't turn around when Crane scrambled onto the top of the shelf of rock. She was standing between two pioneer saplings that clutched the rock with gnarled roots, looking down at the noisy whitewater stream. She said, "There's a gate here somewhere. We must find it."

That was the least of Crane's problems. He said, "There will be plenty of ways in. Students use this place, and most hackers are students. They have free unlimited time on the Internet, and access to powerful computing facilities. If Barbara Andresson passed this way, she won't have used the official STP package,

but one of the rabbit holes."

"She stole the key from me! You must find her!"

"Before she destroys the world? Before she crashes the Internet? What game are you a part of?"

Gabriel Hale looked over her shoulder. She was breathtakingly beautiful, heartbreakingly beseeching. Her sunhat had gone, and her blonde hair tumbled artfully around her face. She said, "It is no game."

"You aren't Gabriel Hale. Not the real one, the person who works for Barbara Andresson. Are you her agent?"

"I have no need of an agent," the entity that called itself Gabriel Hale said. "You will help me find her. Please?"

"I was hoping it would be the other way around," Crane said, opening his toolkit. The coding here was clunky and overly ornate, a gothic cathedral of a virtuality compared to the streamlined superscrapers of modern simulations, but it made his job as easy as tracking someone in virgin snow. He said, "We should walk a little way downstream."

There was a path winding between the big columns of the trees, and then a rope bridge that crossed the stream to steps climbing the steep slope above the stream on the other side. Little signs appeared here and there as they walked, scrolling down in the air, identifying species of plants and explaining how they fit into the ecology of the forest. It was spookily quiet.

"Very few animals," Gabriel Hale said, when Crane commented on the silence. "Most of the productivity is tied up in these big trees, and the trees shade out most other plants."

"Oh. I thought they just hadn't bothered to code in animals."

More and more stone broke through the forest floor, a wave of rock rising up into a wall of a ruined church, with pointed arches containing intact stained glass windows, and broken columns in its nave. A little cottage sheltered in the lee of the ruins, and an old woman came out of it and beckoned to them.

Gabriel Hale clutched Crane's arm, and he explained that the church, the cottage, the old woman, were all part of a common gatekeeper program. "Hackers like to get into places other people don't know about, and this program keeps other people away. Bad things happen to people who approach it the wrong way. But it's okay. I know how it works."

"Bad things?"

"Ghouls. Zombies. Gargoyles." Crane pointed, and a slate gray thing squatting in the angle where a buttress met the wall yawned, showing a red mouth full of

sharp teeth.

"You don't need to mind 'em, dearie," the old woman said. "Not if you know how to do right by old Gretchen."

"I don't like this old woman," Gabriel Hale whispered to Crane. "I don't like the way she stares at me."

"Well, you'll have to go this way if you want to follow Barbara Andresson. Because this is how she left the simulation."

"We have to catch her!"

"Why the urgency?"

"Before it is too late," Gabriel Hale said.

Crane gave the old woman a cookie. She stuck it in her toothless mouth and said, "That will do nicely, dearie," and ushered Crane and Gabriel Hale into the little cottage. It glowed with polished wood and brasses. A cat slept by the blackleaded range. A grandfather clock ticked in a corner.

The old woman said that she had seen the little girl. She knew where she had gone. A door opened onto a flood of light, and they stepped through.

A FLAT PLANE of slightly unfocused gray and red tiles under a uniform blue sky. Gabriel Hale's face a pink mosaic, blue rectangles for eyes, a slot for a mouth. Something wrong, Crane couldn't, uh, figure out what. Something...bad? Something ....

"Too slow," Gabriel Hale said.

What did she mean? Her words slipped away. Searching for meaning was not exactly .... Tiring, yeah. But what?

Then she grabbed his hand, and he could think again.

"The processing is too slow here," she said. "It's affecting you through the link in your head."

"What did you do?" Crane tried to read his toolkit, but it was a smear of overlapping black and white tiles.

"Don't let go of my hand. I'm linking you with the computer you started from."

He peered at her, but her expression was unreadable. The tiling was too clunky.

"A MUD," Crane said, realizing where they were. A Multi-User Dungeon. Very popular with students in the Nineties. This one must still be running on some obsolete server, forgotten. Crane shivered. It was the cyberspace equivalent of

a tar pit. He could have been stuck here forever.

"Not forever," Gabriel Hale said. "But a long time. She was here, and she escaped. But she was delayed. We're a lot closer now."

"She went this way to trap anyone who followed," Crane said. "Well, she nearly succeeded. We have to get out too, and I can't use my toolkit."

"I know how to use it now. I watched you. We ported here by a funny route, one not on any map. We have to leave by another funny route. Here."

"They're back roads," Crane said, before he realized that they had moved on.

It looked like an old-fashioned library. The kind with books. Circular tiers of chained, leather-bound volumes, each tier circled by an iron lattice walkway or balcony, dwindling it seemed into infinity. There was a constant strange flickering in the light, and a high-pitched twittering, as if someone was playing a speeded-up recording of birdsong.

It was the graphic interface of a Bulletin Board System. The flickers and twitterings were users -- or mostly, their agents -- logging on, depositing or retrieving information, logging off.

"She was looking for something," Crane told Gabriel Hale. "This is a hacker's place, so most likely she was looking up a back road route. That's what they specialize in here."

He had to explain about back roads. He didn't mind. He'd been a hacker once, and hackers loved to talk, to boast. None of what they won from the system was tangible, and boasting was a way of establishing status. Crane hadn't lost the habit.

Hackers liked to travel the Internet by odd routes. Back roads. Rabbit holes. The communications system which linked subsets to Internet nodes, and nodes to other nodes, was impossibly complicated; its prototype had been designed with multiple redundancy, to keep running even if nuclear war took out large numbers of nodes. As communications technology improved, so lines and servers were made redundant as newer and faster lines and servers were set up. Copper wire superseded by glass fiber optics superseded by monomolecular diamond crystal. After a while, telcom companies stopped bothering to dismantle the old lines, simply ran new ones alongside. By this time, most servers were actually in the lines anyway rather than in desktop boxes, bundles of chips built by nanotechnology wrapped around diamond strands the width of a human hair which each carried a hundred thousand high bandwidth lines.

Hackers hacked the obsolete lines, the back roads, the old tech. They reset mothballed servers and switching stations, built a ghost Internet that paralleled the official one. Crane had mapped and run his share of back roads when he was a hacker, and as a lineman sometimes had to dismantle them when unauthorized patches caused conflicts in a client's system.

This underground Bulletin Board System was squatting in an antiquated router in Singapore's stock exchange. Hackers liked to tweak stuff in Singapore, which boasted that it had impregnable firewalls.

"Andresson went through here," Crane told Gabriel Hale, "but she wasn't smart enough to erase her footprints. Typical telco thinking. Use a system, but don't exploit its potential to the full. I bet she reads manuals in her spare time."

"Then we can find her?" Gabriel Hale was bright-eyed. She had not let go of his hand. He was intensely aware of her perfumed warmth. Although they had ported to the BBS, they were both still interacting in Barbara Andresson's supercomputer. She seemed as real as life. Crane briefly wondered what sex would be like, but suppressed the thought. After all, she was almost certainly not human, and he'd given up interactive sex. Yeah, right.

By now, they had been here long enough to attract the attention of the BBS's sysop. A little black cloud, initially no larger than a man's hand, coalesced above them. Thunder, lightning. The cloud pulsed, puffing itself with each thundercrack. A voice like Charlton Heston playing God boomed out.

"What are you doing here, transgressors? Prepare to face my mighty wrath!"

Crane's agent materialized. "The operator styles himself 'Karrier Kulprit,' of the Phlash Phoneline Phantoms, sir. He also uses the nom-de-plume 'Aslan.' His real name is Jerry Combs. Mr. Combs is fourteen years old, and operates from his bedroom in his parents' house in Normal, Illinois."

"Hey, guy," God boomed uncertainly, "are you trying to hack my board? It's acting funny."

Crane talked with the sysop for a while. The boy sent away the thundercloud, reappeared as a burning bush. He spoke from the middle of the flames, told Crane that weird things were happening.

"So I hear."

"There's rumors of aliens in the system, guy. Got here through one of the NASA interstellar probes. Masqueraded as data, unpacked themselves on arrival and downloaded into the net. Like a bunch of macro text viruses."

Crane was amused. "Pretty smart of them to happen to share our operating language."

"Aw," the voice from the burning bush said, "they got that from the probe's computers, guy. My homey, Prophet Motive, says that they're from Alpha Cee One, but I reckon Tau Ceti or Lalande 21185. Everyone knows that Alpha Cee doesn't have planets."

Crane said, "I'm looking for someone who passed through. By the name of Barbara

Andresson."

"The Point of Presence woman? Yeah, she was here asking about stuff. But then this is a pretty cool BBS."

"I need to know what she looked at. I'm searching for her. I can trade."

"Guy, and I thought maybe you were hunting for the aliens."

"My friend and I are looking for Barbara Andresson."

"Yeah? Your buddy, he's not logged on with you?"

Crane looked at Gabriel Hale with a mixture of suspicion and amazement. He didn't know of any program or avatar or agent that was able to make itself invisible to a system operator.

"Hey, I can tell you what you want to know," the voice from the burning bush said. "But what do you have for trade?"

Crane gave up one of the old telco links that linemen sometimes used as short cuts when the commercial lines were clogged with traffic. It was about to be ripped out, but Karrier Kulprit wasn't to know that.

"Hey, neat," the kid said. "Okay, she looked at this stuff here, and then she went that way."

Crane and Gabriel Hale went that way, too.

An old switching station, manifesting as a vast loom of cables in a gigantic cordboard, a cliff punctuated by thousands of metal-rimmed holes. Things lived high above. They moved on quickly.

A desert battlefield simulation with oil wells flaring furiously on the black horizon. Maybe a game, maybe some army's virtual training ground.

An empty office, tall windows opening onto brain gray blankness, walls sprayed with hacker tags.

They flipped past a dozen more locations.

And ended in a city.

London. Eerily quiet, as if abandoned before the onset of some all-encompassing catastrophe. They had come out of the main door of St. Martin's Church. The broad flight of steps overlooked Trafalgar Square, abandoned even by its pigeons. The sky was the color of milk. It was sometime in the early 1960s, a soot-stained horizontal city with black and white traffic signs, ornate green lampposts.

Crane knew where he was now.

"It's a virtual set," he told Gabriel Hale. "Made for a saga called Invasion of the Daleks and then left on the studio's server. Memory is cheap. Easier to leave it than wipe it."

"She's getting closer. Please, we must stop her!"

"There's a place linemen use stashed away here. It tangles back roads together."

They started to walk toward the river. It was not a complete rendition. There were gaps here and there that translated them unexpectedly through the deserted streets. The buildings were no more than shells, gray blur behind their windows. The same gray blur at the bottom of steps leading down to the Underground. St. James's Park a level green shimmer. The Thames like a sheet of glass, the far bank shrouded in mist.

The Ministry of Defense was a monolithic cube, its white walls studded with hundreds of windows. They went past the commissioner's booth and crossed the echoing foyer, climbed a flight of stairs to a long corridor that stretched away in the sterile glow of fluorescent lights. Tall ecclesiastical windows on one side, mahogany doors framed by columns on the other. Their footsteps were muffled by the strip of red carpet laid down the middle of the marble floor.

Suddenly, jeeves was walking alongside them.

"I believe that you may need help, sir," the agent said.

"Where is she?"

"Looking for the right door, sir. Fortunately, she is not skilled."

Gabriel Hale began to run down the corridor, her white dress streaming behind her like smoke.

Crane ran after her, but she ran very fast and this simulation was too accurate; he could only run as fast as his real body could run. The corridor seemed to stretch for kilometers, longer by far than the building which contained it. A long way ahead, Gabriel Hale was closing on a little girl who was struggling with a door. There was a wicker basket on the girl's arm. As Gabriel Hale approached, a small dog, a bristling black rat-terrier, jumped from the basket and danced forward, barking loudly.

"Keep away," the little girl said. "Keep away, or he'll rip your codes to shreds."

Gabriel Hale held out her hands as Crane came up behind her. She said, "I want what is mine."

"I'm going to put it back where it came from and seal that door forever," the

little girl said. She wore a starched gingham dress. Her hair was tied back in pigtails. "Things have got out of hand. I'm shutting it all down."

"I want what is mine," Gabriel Hale said again. She stepped forward, and the dog launched itself at her throat.

Crane's agent, jeeves, appeared in front of her and caught the dog's bristling missile in midflight. But it twisted from jeeves's white gloved hands, bounced once on the floor, and went to the attack. Straw and chunks of foam and excelsior and polystyrene chips flew everywhere and jeeves beat feebly at the dog as he subsided into a heap of clothes topped by a pink head.

"You didn't have to do that, Dr. Andresson," Crane told the little girl.

She stared at him defiantly. Eyes bright and dead as blue glass, a spray of freckles across her cute-as-a-button nose. "And who the fuck are you? You're using my interface. Are you helping her?"

"I was sent by your company. I'm here to help you. I'm a lineman. That's my agent you just trashed."

"I'm sorry, sir," jeeves's head said weakly. "It was stronger than it looked."

"You'll get the same," the little girl told Crane, "if you try and interfere. My people are fools. I know what I'm doing."

The rat-terrier cocked its head at Crane and growled.

Crane said, "They are worried about you. They want you back. I can help you."

"Perhaps you can get this door open with your toolkit."

"Perhaps. If I knew what was behind it."

"I believe, sir, it is a way to Dr. Hale's personal computer," jeeves's disembodied head said.

"She has what is mine," Gabriel Hale said. She had backed up against the wall. She gave Crane a heartbreaking look and said, "Tell her to give it to me."

"Don't listen to her," the little girl, Barbara Andresson, said. She started tugging at the brass handle of the tall mahogany door, lunging at it, hanging from it, pulling with all her weight. It didn't budge. She gave the door's polished panels an angry kick and said, "She's part of an experiment that got out of control. She's harmless as long as I have the key. Don't just stand there, man! Help me get this line open. It ports to the place where she emerged, and I'm going there and closing it down before more things like her come through."

"She is nothing to do with your experiments," jeeves's head said. "She is an

emergent god of the Internet."

"I heard she's from Tau Ceti," Crane said. "But I think it's more likely she's from your experiments with artificial life. She took the name of your collaborator on that project. Why are you so afraid of her?"

"The ecosystem was weighted to create an intelligent species, and that's what it did just a few days ago. I think they found a way out. I think they sent someone through."

Gabriel Hale laughed.

Crane said, "They must be pretty smart."

"Much less than the average human," the little girl said, "but they live at computer speeds. Thousands of times faster than we do. Will you help me, or do I have to delete you?"

"Don't listen to her," Gabriel Hale said. "She's a thief. She's a liar. She took the key from me."

"If I have what's yours," the little girl said, "tell me what it is. A key, but what does it open?"

"If I knew what it did, I wouldn't need it."

"No one wants me to know anything," Crane said. "I'll listen to both of you. Then I'll make up my mind."

"Their mathematical system is very different from ours," the little girl said. "They're not really interested in proof, but do all their mathematics empirically by computer search through billions and billions of cases. They discover proofs by collecting correspondences rather than formulating laws, just as we can say Newton's Law of Gravity is true even though we haven't seen every apple fall. We know apples fall to the ground because we've seen enough fall to the ground to assume that all others will behave in exactly the same way. We know that apples don't fly up, or sideways. That's how my creatures work. If after studying a hundred trillion examples of sets of numbers their computers find what we call Pythagoras's Theorem is true, then they say it's true. Oh, they know about proof, but they know it's limited by things like Godel's Incompleteness Theorem. But their computer searches aren't limited, so they can jump out of the logical deductive process. And that's how they discovered a way of entering computer systems that aren't connected."

"They escaped," Crane said. "They found a back door into the Internet."

"Very good!" The little girl smiled. There was an endearing gap between her front teeth but her eyes were as cold as ice. "Yes, they escaped. I think they did it by quantum tunneling. There is a stochastic probability that any quantum particle like a photon or an electron can find itself on the other side of an

impermeable barrier. Computers interface through streams of electrons or photons, and perhaps the aliens changed the probabilities. Think of the chaos that might be caused if every user could be connected with every possible place in the Internet, if every possible subset could be connected with every other subset. It would be an end to secure databases and transmissions, to begin with. No amount of encryption could protect messages if anyone could read them at the originating terminal."

"A wormhole in cyberspace," Crane said. Now he knew why Barbara Andresson was so anxious to keep this secret.

"You have been reading too much sci-fi," the little girl sneered.

Crane was stung by the insinuation that he might do anything as uncool as read a book; he knew about wormholes from one of the Star Trek series. They were the ultimate kind of back door, shortcuts that connected distant points in space through higher dimensions.

He told the little girl, Barbara Andresson, "I can see why a telco would want to keep it secret."

"She is a danger to us all," the little girl said. "You will help me now, and put an end to it."

Gabriel Hale laughed again.

Crane said, "This interface we're using. Did you invent it, or did you steal it from the aliens?"

"I own them," the little girl said.

"No one owns anyone else. In the real world, or in virtuality. I believe that 'Gabriel' means 'messenger.' I think she came here to tell us something. I want to hear what she has to say. You think you have the right to stop her, Dr. Andresson, but that's typical telco bullshit. Suppress anything that might upset the system. Keep things safe, under control. Well, I work the lines. I know that the world in the wires is as strange as the world outside."

"I wish I could tell you why I'm here," Gabriel Hale said, "but I can't remember. But I know she has what I need."

"She means the key," the little girl said, putting one hand on the cloth which covered the contents of her basket. "Stay away, Mr. Crane, or I'll rip your codes. And because you're using the interface that will hurt you badly. Maybe I should do it anyway. You say you're a lineman, but you sound more like an unreconstituted hacker to me."

The dog growled, but it wasn't looking at Crane. Flames licked out of midair and spun in a hoop. A lion jumped through the ring of fire, lithe and hugely golden. The dog yelped and turned tail and ran, dwindling into the long perspective of

the corridor.

"I put a trace on you when you ported from my BBS," the lion said. "You thought you could buy me off with that cruffy back road, guy, but I'm way smarter than you thought. I traced you, followed you, and beat off the watchdog program. So, what is this place?"

And Crane stepped up to the little girl, slapped her hand away, and took out the thing she had in her basket.

IT WAS AN IMPACTED node of fantastically involuted code. It shone like a water-polished pebble. Crane's toolkit couldn't even begin to parse it, but when he gave it to Gabriel Hale she shook it lightly and it immediately unfolded in midair. A frame that seemed to lead at right angles to everything else.

"Guy," the lion, Karrier Kulprit, said. "It's there, but it isn't."

Crane checked his toolkit. The hacker was right. The door was the access to an open line that had no physical component. It really was a wormhole, folding together two points in cyberspace. He looked at Gabriel Hale. She shone with an inner light, so bright that he could hardly look at her. She seemed bigger, too, although she hadn't changed at all.

"First contact," the lion said, in its querulous teenage voice.

"She went straight to you because you were using the interface you took from her people," Crane said to the little girl. "She wanted to talk, but you were scared. You took her message and you ran away."

"Don't be afraid," Gabriel Hale said. "I remember why I'm here now. Will you come with me?"

"Where?"

"Heaven," jeeves said, and in a rush of straw and foam and polystyrene snow he regrew and gravely bowed to Gabriel Hale.

"Tau Ceti," the lion rumbled.

"The end of the world," the little girl said, but there was a note of doubt in her voice, and the light of the messenger shone in her eyes.

"I came here to talk to everyone in the world," Gabriel Hale said. She held out her hands. "And while I'm doing that, I'll take you somewhere wonderful."

Together, the lineman, the little girl, the lion and the agent followed the messenger through the wormhole.

All over Earth billions of phones reset themselves and started to ring.

