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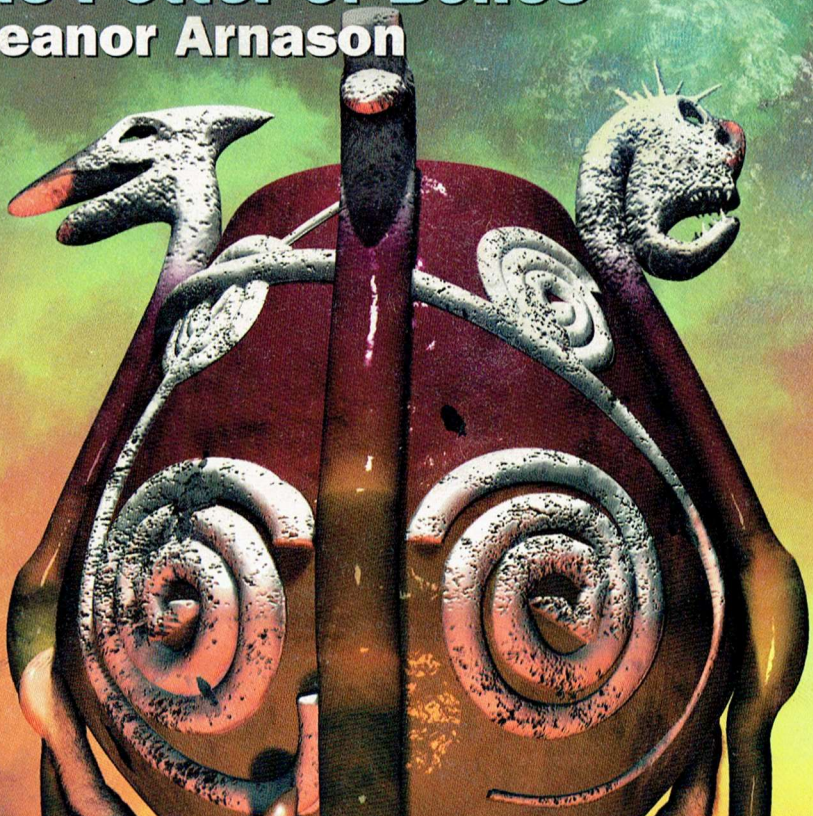

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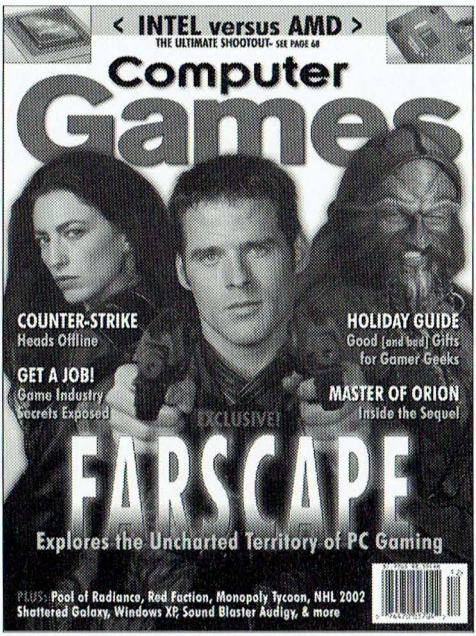

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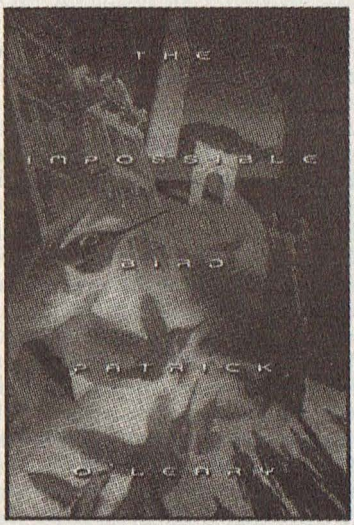

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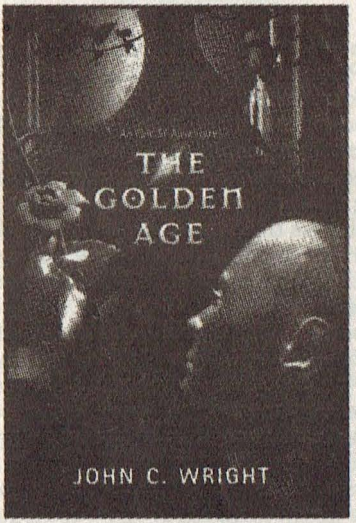

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REFLECTIONS

by Robert Silverberg

BURNING SCIENCE AT THE STAKE

In the early fourteenth century, Pope Boniface VIII issued a decree forbidding the dissection of human corpses for anatomical study. Such doctors as Pietro d'Abando of Italy who had sought better understanding of the human body by examining cadavers thus made themselves vulnerable to charges of sorcery, heresy, and necromancy, and were subject to trial by the Inquisition. Pietro died before he could be convicted, but the Inquisitors burned his body.

From then until the repeal of Boniface's decree in 1556, those who dared conduct studies in human anatomy had to work surreptitiously—the most famous example being that of the anatomist Andreas Vesalius, who would visit places of execution where criminals had been left hanging overnight and carry out secret dissections by torchlight. His famous book of 1543, *On the Structure of the Human Body,* provided the first reliable information on human anatomy ever compiled. Much persecuted for impiety, Vesalius wandered from country to country and eventually, to escape the Inquisition, undertook a pilgrimage to Jerusalem, where he died.

Through his studies of heavenly bodies the Polish astronomer and mathematician Nicolaus Copernicus came to believe that the theory that the Earth was the center of the universe—an essential part of Christian dogma—was wrong. For twenty years he worked on a book he called *On the Revolution of the Celestial Orbs,* but did not publish it—not out of fear of religious persecution, but because he mistrusted his data. (He knew that something was wrong with his theory, but it remained for a later astronomer, Johannes Kepler, to show that the planets move in elliptical orbits, not the circular ones of Copernicus's hypothesis.) Eventually, in 1542, less than a year from the end of his life, Copernicus did allow his book to be published. It caused no great theological stir at the time, apparently because both the Catholic and Protestant churches looked upon it as absurd, rather than as ideologically dangerous.

But Kepler's work, and then that of Galileo Galilei in the early seventeenth century, was much more threatening. Galileo, in 1615, went so far as to say that if one took the Bible literally on astronomical matters, "one might fall into error." This embroiled him in decades of controversy with the fathers of the Church and finally, after a trial by the Inquisition that found him guilty of heresy and sentenced him to prison, he recanted his belief in the movement of the Earth around the Sun and was set free. He was then seventy years old, and in his remaining years said nothing more on the subject of the movements of the planets.

What must have been on Galileo's mind at his trial was the fate of Giordano Bruno, an Italian philosopher and supporter of the Copernican theories, who postulated that the universe was infinite and contained an infinity of worlds, and who was imprisoned by the Inquisition from 1593 to 1600 and finally burned at the stake, defiant to the end. He was, I suppose, the last scientific thinker

to be martyred for disagreeing with official theological belief. Burning at the stake has gone out of fashion in modern times. Scientists and religious leaders still often find themselves in conflict these days, but it is science itself, not the scientists, that the advocates of faith would like to burn.

This brings me, of course, to the great stem-cell controversy that has occupied so much public attention recently. I am writing this during the summer of 2001, but I suspect that the uproar will still be going on when you see it.

The briefest of summaries, since surely you all know the basic story by now: In 1998 Dr. James A. Thomson, a University of Wisconsin biologist, announced that he had been able to extract "stem cells," capable of being grown into any sort of bodily cell or tissue, from human embryos. The possibility thus arose that tissue derived from embryonic stem cells could serve to rebuild a damaged heart or a failing liver or a deteriorating pancreas, replace neurons injured by a stroke or a neurological disease, restore the skin of a burn victim, reconstruct an injured spine, and so on—a wide range of miraculous-sounding remedies for almost every bodily ill.

The big problem, though, is that embryonic stem cells come from embryos, and in the United States of the twenty-first century, embryos are regarded by a goodly percentage of the population as sacred and untouchable. An embryo used for stem-cell work is thereby prevented from completing the process of cell division and ultimately developing into a human being; thus, technically speaking, stem-cell work is a kind of abortion. And so stem cells hit the front pages.

Abortion on demand has been legal in the U.S. for decades, despite powerful religious opposition. Abor-

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tion is not something that anyone would lightly undertake, but there are those—a majority of citizens, I think—who believe that it is sometimes justifiable to abort an unborn child and that abortion should be available, *as a matter of individual choice,* to those who wish to take advantage of it. Others feel that human life is the gift of God, and that gift must never be rejected. The politicization of the abortion issue is reflected in its velvet-glove semantics: one group calls itself "pro-choice," not "pro-abortion," and the other uses the label "pro-life" instead of "anti-abortion."

If it were only a matter of private choice, stem-cell research would now be marching vigorously ahead in the United States. The big problem is that most modern scientific research is carried out with the help of government money. Once taxpayer dollars start to be spent on work that involves the destruction of embryos, members of the pro-life faction might quite reasonably object that they are being made unwilling contributors to research they abhor.

In 1996—two years before the first successful stem-cell experiments—Congress banned the use of federal funds for all kinds of embryo research. In January, 1999, the Clinton Administration ruled that stem-cell work did not fall under this ban, and three laboratories promptly applied for and received permits to proceed with government-funded studies. But George W. Bush, soon after his inauguration, put a hold on further expansion of such work pending a full review of the moral issues involved.

What he meant, of course, was the *political* issues involved. The heart of his political support came from conservatives, and many conservatives—though not, I assure you, all of them—tend to take "pro-life" positions. President Bush wanted to see where his political base stood on the issue before announcing the new administration's policy.

He promptly got conflicting and confusing advice. Catholic leaders, on up to the Pope (not an American citizen), called for a ban on *all* stem-cell work, whether publicly or privately funded. So did many Protestant churchmen, even the leaders of the "pro-choice" United Methodist Church. But from Nancy Reagan, not ordinarily considered a spokesman for liberal causes, came a plea for continued research. She saw it as offering hope for victims of Alzheimer's disease, of whom her husband, the former president, is one. Two conservative anti-abortion Senators, Orrin Hatch of Utah and Bill Frist of Tennessee, also announced their support for government funding of embryonic stem-cell research, pointing out that work that could help people afflicted with devastating diseases cannot be called anything other than "pro-life."

After weighing all the pros and cons, President Bush finally spoke to the nation last August. His speech acknowledged the importance of allowing the free play of scientific thought, but also noted that many Americans see stem-cell work as abortion and therefore oppose it. In the end he offered a Solomonic decision: stem-cell work now under way could continue with federal support, but his administration would not license any expansion of the research. And there, I think, the matter will rest for the time being.

Some points to consider, as we go forward:

1) If ongoing embryonic stem-cell research actually does produce the miracle cures that have been suggested, overwhelming public pressure to expand stem-cell studies will sweep all political opposition aside, abortion issue or no.

2) The embryos being used are the surplus by-products of attempts at inducing *in vitro* pregnancies for otherwise infertile couples. Fertility clinics create more embryos per couple than are needed, implant the healthiest, and the rest are either destroyed or allowed to expire, except for the few that are contributed to medical research or donated to other couples. Hundreds of thousands of embryos have perished this way, quite legally. If prohibitions on stem-cell research go into effect, hardly any of these embryos will ever grow to full development and all of them will be pointlessly lost to science. While we cherish and preserve the rights of embryos that are destined to perish no matter what, real living people will go on bearing the burden of severe bodily afflictions. The absurdity of throwing embryos away rather than using them in stem-cell research will eventually make itself felt. Nor are embryonic cells the only useful kind. Non-controversial adult stem-cells may prove just as valuable.

3) Stem-cell work will proceed in other countries that lack our atavistic fear of Things That Man Was Not Meant To Do. It's legal right now in Great Britain, Sweden, Israel, and Japan. Research is going on in those places at this moment. Some American stem-cell scientists, such as Roger Pederson of California, are packing up and leaving for England. If stem-cell research ever does deliver on its promise while coming under some sort of ban in our country, American patients may have to go overseas to benefit from it, and only the wealthiest will be able to. This is sure to stir political storms here.

The campaign against embryonic stem-cell research makes me wonder whether the century we are entering will be the bold, innovative,

shining one promised us by so much science fiction, or the dark, cramped, medieval one Robert A. Heinlein forecast in his Future History stories. But I take heart from the fact that the worst-case scenario was avoided: the anti-science faction was not able to bring about a complete ban on stem-cell work, even with the "pro-life" George W. Bush in the White House. The work will proceed, albeit hampered somewhat by political opposition, but moving on all the same toward an exploration of the potentials of this startling new technology. Any sign of real progress toward real benefits will make it unstoppable. Meanwhile, our stem-cell researchers will not be driven underground, as could easily have happened, or forced to go overseas. Though scientists can no longer be burned at the stake for their ideas, a whole branch of science nearly was, just now, in this country, and that has been avoided. It will be interesting to see what happens next. ❍

16TH ANNUAL READERS' AWARD RESULTS

(left to right) JIM GRIMSLEY, JOE HALDEMAN, AND MICHAEL CARROLL

Photo credit: Beth Gwinn

It's time to tell you the winners of the *Asimov's Science Fiction* Annual Readers' Award poll, which is now in its sixteenth year. As always, these were your choices, the stories and artwork and poetry that you—the readers—liked best out of all the stuff we published in 2001. The readers were the only judges for this particular award—no juries, no experts—and, as always, it's intriguing to compare results with the Hugo and Nebula ballots, as well as with the readers' poll conducted by *Locus*. This year's winners, and runners-up, were:

BEST NOVELLA

1. **STEALING ALABAMA; ALLEN M. STEELE**
2. deck.halls@boughs/holly; Connie Willis
3. The Caravan from Troon; Kage Baker
4. The Chief Designer; Andy Duncan
5. Coming to Coyote; Allen M. Steele
6. Moby Quilt; Eleanor Arnason
7. Shady Lady; R. Garcia y Robertson
8. The Mystery of Laura Molson; L. Timmel Duchamp
9. Female Action; Eliot Fintushel

BEST NOVELETTE

1. **INTO GREENWOOD; JIM GRIMSLEY**
2. Undone; James Patrick Kelly
3. The Days Between; Allen M. Steele
4. Lincoln in Frogmore; Andy Duncan
5. The Applesauce Monster; Kage Baker
6. Seven Times Never; Robert R. Chase
7. Ice and Mirrors; Brenda Cooper and Larry Niven (tie)
7. Lobsters; Charles Stross (tie)
8. Monster Story; Kage Baker
9. Computer Virus; Nancy Kress
10. Liberty Journals; Allen M. Steele

BEST SHORT STORY

1. **OLD MACDONALD HAD A FARM; MIKE RESNICK**
2. The Ghost Pit; Stephen Baxter
3. Cut; Megan Lindholm
4. The Dog Said Bow-Wow; Michael Swanwick
5. The Infodict; James Van Pelt
6. The Cold Sink; Stephen Baxter
7. Exclusion; Daniel Abraham
8. Prisoner Exchange; Lois Tilton
9. Studio Dick Drowns Near Malibu; Kage Baker
10. The Dust Enclosed Here; Kage Baker

BEST POEM

1. **JANUARY FIRES; JOE HALDEMAN**
2. Ways to Tell if Your Cat Is a Space Alien; Geoffrey A. Landis
3. Ten Things Not to Say When You Meet a Famous SF Writer; Bruce Boston
4. All I Want for Christmas; Robert Frazier & James Patrick Kelly
5. The Reluctant Astronaut; Linda Addison
6. Gulliver's Boots; Geoffrey A. Landis (tie)
6. We Die as Angels; William John Watkins (tie)
7. More Ways to Tell if Your Cat Is a Space Alien; Mary A. Turzillo
8. How to Detect a Ghost; G.O. Clark
9. Unreal Messages?; Ian Watson (tie)
9. Bacchanal; Tim Pratt (tie)
10. Incident; Tim Pratt

Continued on page 95

THE POTTER OF BONES

Eleanor Arnason

Illustration by Steve Cavallo

Eleanor Arnason taught a science fiction, fantasy, and poetry writing workshop in northern Iceland this past June. Her co-teacher was the distinguished poet John Calvin Rezmerski, winner of a Rhysling Award for SF poetry as well as numerous mainstream honors. They expect to do the workshop again in June of 2003. Watch *Locus* and the freebie table at cons for further information. "In June in northern Iceland, there are twenty-two hours of daylight. Wild swans are nesting in the fields; the sheep have lambs; and horses have foals; and there are hot tubs and heated swimming pools provided by nature." We expect she picked up lots of material for new stories from this experience.

The northeast coast of the Great Southern Continent is hilly and full of inlets. These make good harbors, their waters deep and protected from the wind by steep slopes and grey stone cliffs. Dark forests top the hills. Pebble beaches edge the harbors. There are many little towns.

The climate would be tropical, except for a polar current that runs along the coast, bringing fish and rain. The local families prosper through fishing and the rich, semi-tropical forests that grow inland. Blackwood grows there, and iridescent greywood, as well as lovely ornamentals: night-blooming starflower, day-blooming skyflower and the matriarch of trees, crown-of-fire. The first two species are cut for lumber. The last three are gathered as saplings, potted and shipped to distant ports, where affluent families buy them for their courtyards.

Nowadays, of course, it's possible to raise the saplings in glass houses anywhere on the planet. But most folk still prefer trees gathered in their native forests. A plant grows better, if it's been pollinated naturally by the fabulous flying bugs of the south, watered by the misty coastal rains and dug up by a forester who's the heir to generations of diggers and potters. The most successful brands have names like "Coastal Rain" and emblems suggesting their authenticity: a forester holding a trowel, a night bug with broad furry wings floating over blossoms.

This story is about a girl born in one of these coastal towns. Her mother was a well-regarded fisherwoman, her father a sailor who'd washed up after a bad storm. Normally, a man such as this—a stranger, far from his kin—would not have been asked to impregnate any woman. But the man was clever, mannerly, and had the most wonderful fur: not grey, as was usual in that part of the world, but tawny red-gold. His eyes were pale clear yellow; his ears, large and set well out from his head, gave him an entrancing appearance of alertness and intelligence. Hard to pass up looks like these! The matrons of Tulwar coveted them for their children and grandchildren.

He—a long hard journey ahead of him, with no certainty that he'd ever reach home—agreed to their proposal. A man should be obedient to the senior women in his family. If they aren't available, he should obey the matrons and matriarchs nearby. In his own country, where his looks were ordinary, he had never expected to breed. It might happen, if he'd managed some notable achievement; knowing himself, he didn't plan on it. Did he want children? Some men do. Or did he want to leave something behind him on this foreign shore, evidence that he'd existed, before venturing back on the ocean? We can't know. He mated with our heroine's mother. Before the child was born, he took a coastal trader north, leaving nothing behind except a bone necklace and Tulwar Haik.

Usually, when red and grey interbreed, the result is a child with dun fur. Maybe Haik's father wasn't the first red sailor to wash up on the Tulwar coast. It's possible that her mother had a gene for redness, which finally expressed itself, after generations of hiding. In any case, the child was red with large ears and bright green eyes. What a beauty! Her kin nicknamed her Crown-of-Fire.

When she was five, her mother died. It happened this way: the ocean current that ran along the coast shifted east, taking the Tulwar fish far out in the ocean. The Tulwar followed; and somewhere, days beyond sight of land, a storm drowned their fleet. Mothers, aunts, uncles, cousins disappeared. Nothing came home except a few pieces of wood: broken spars and oars. The people left in Tulwar Town were either young or old.

Were there no kin in the forest? A few, but the Tulwar had relied on the ocean.

Neighboring families offered to adopt the survivors. "No thank you," said the Tulwar matriarchs. "The name of this bay is Tulwar Harbor. Our houses will remain here, and we will remain in our houses."

"As you wish," the neighbors said.

Haik grew up in a half-empty town. The foresters, who provided the family's income, were mostly away. The adults present were mostly white-furred and bent: great-aunts and -uncles, who had not thought to spend their last years mending houses and caring for children. Is it any wonder that Haik grew up wild?

Not that she was bad; but she liked being alone, wandering the pebble beaches and climbing the cliffs. The cliffs were not particularly difficult to climb, being made of sedimentary stone that had eroded and collapsed. Haik walked over slopes of fallen rock or picked her way up steep ravines full of scrubby trees. It was not adventure she sought, but solitude and what might be called "nature" nowadays, if you're one of those people in love with newfangled words and ideas. Then, it was called "the five aspects" or "water, wind, cloud, leaf, and stone." Though she was the daughter of sailors, supported by the forest, neither leaf nor water drew her. Instead, it was rock she studied—and the things in rock. Since the rock was sedimentary, she found fossils rather than crystals.

Obviously, she was not the first person to see shells embedded in cliffs; but the intensity of her curiosity was unusual. How had the shells gotten into the cliffs? How had they turned to stone? And why were so many of them unfamiliar?

She asked her relatives.

"They've always been there," said one great-aunt.

"A high tide, made higher by a storm," said another.

"The Goddess," a very senior male cousin told her, "whose behavior we don't question. She acts as she does for her own reasons, which are not unfolded to us."

The young Tulwar, her playmates, found the topic boring. Who could possibly care about shells made of stone? "They don't shimmer like living shells, and there's nothing edible in them. Think about living shellfish, Haik! Or fish! Or trees like the ones that support our family!"

If her kin could not answer her questions, she'd find answers herself. Haik continued her study. She was helped by the fact that the strata along the northeast coast had not buckled or been folded over. Top was new. Bottom was old. She could trace the history of the region's life by climbing up.

At first, she didn't realize this. Instead, she got a hammer and began to break out fossils, taking them to one of the town's many empty houses. There, through trial and error, she learned to clean the fossils and to open them. "Unfolding with a hammer," she called the process.

Nowadays we discourage this kind of ignorant experimentation, especially at important sites. Remember this story takes place in the distant past. There was no one on the planet able to teach Haik; and the fossils she destroyed would have been destroyed by erosion long before the science of paleontology came into existence.

She began by collecting shells, laying them out on the tables left behind when the house was abandoned. Imagine her in a shadowy room, light slanting through the shutters. The floor is thick with dust. The paintings on the walls, fish and flowering trees, are peeling. Haik—a thin red adolescent in a tunic—bends over her shells, arranging them. She has discovered one of the great pleasures of intelligent life: organization or (as we call it now) taxonomy.

This was not her invention. All people organize information. But most people organize information for which they can see an obvious use: varieties of fish and their habits, for example. Haik had discovered the pleasure of knowledge that has no evident use. Maybe, in the shadows, you should imagine an old woman with white fur, dressed in a roughly woven tunic. Her feet are bare and caked with dirt. She watches Haik with amusement.

In time, Haik noticed there was a pattern to where she found her shells. The ones on the cliff tops were familiar. She could find similar or identical shells washed up on the Tulwar beaches. But as she descended, the creatures in the stone became increasingly strange. Also, and this puzzled her, certain strata were full of bones that obviously belonged to land animals. Had the ocean advanced, then retreated, then advanced again? How old were these objects? How much time had passed since they were alive, if they had ever been alive? Some of her senior kin believed they were mineral formations that bore an odd resemblance to the remains of animals. "The world is full of repetition and similarity," they told Haik, "evidence the Goddess has little interest in originality."

Haik reserved judgment. She'd found the skeleton of a bird so perfect that she had no trouble imagining flesh and feathers over the delicate bones. The animal's wings, if wings they were, ended in clawed hands. What mineral process would create the cliff top shells, identical to living shells, and this lovely familiar-yet-unfamiliar skeleton? If the Goddess had no love for originality, how to explain the animals toward the cliff bottom, spiny and knobby, with an extraordinary number of legs? They didn't resemble anything Haik had ever seen. What did they repeat?

When she was fifteen, her relatives came to her. "Enough of this folly! We are a small lineage, barely surviving; and we all have to work. Pick a useful occupation, and we'll apprentice you."

Most of her cousins became foresters. A few became sailors, shipping out with their neighbors, since the Tulwar no longer had anything except dories. But Haik's passion in life was stone. The town had no masons, but it did have a potter.

"Our foresters need pots," said Haik. "And Rakai is getting old. Give me to her."

"A wise choice," said the great-aunts with approval. "For the first time in years, you have thought about your family's situation."

Haik went to live in the house occupied by ancient Rakai. Most of the rooms were empty, except for pots. Clay dust drifted in the air. Lumps of dropped clay spotted the floors. The old potter was never free of the material. "When I was young, I washed more," she said. "But time is running out, and I have much to do. Wash if you want. It does no harm, when a person is your age. Though you ought to remember that I may not be around to teach you in a year or two or three."

Haik did wash. She was a neat child. But she remembered Rakai's warning and studied hard. As it turned out, she enjoyed making pots. Nowadays, potters can buy their materials from a craft cooperative; and many do. But in the past every potter mined his or her own clay; and a potter like Rakai, working in a poor town, did not use rare minerals in her glazes. "These are not fine cups for rich matrons to drink from," she told Haik. "These are pots for plants. Ordinary glazes will do, and minerals we can find in our own country." Once again Haik found herself out with hammer and shovel. She liked the ordinary work of preparation, digging the clay and hammering pieces of mineral from their matrices. Grinding the minerals was fine, also, though not easy; and she loved the slick texture of wet clay, as she felt through it for grit. Somehow, though it wasn't clear to her yet, the clay—almost liquid in her fingers—was connected to the questions she had asked about stone.

The potter's wheel was frustrating. When Rakai's old fingers touched a lump of clay, it rose into a pot like a plant rising from the ground in spring, entire and perfect, with no effort that Haik could see. When Haik tried to do the same, nothing was achieved except a mess.

"I'm like a baby playing with mud!"

"Patience and practice," said old Rakai.

Haik listened, being no fool. Gradually, she learned how to shape clay and fire it in the kiln Rakai had built behind the house. Her first efforts were bad, but she kept several to store her favorite pieces of rock. One piece was red iron ore, which could be ground down to make a shiny black glaze. The rest were fossils: shells and strange marine animals and the claw-handed bird.

At this point in the story, it's important to know the meaning of the word "potter" in Haik's language. As in our language, it meant a maker of pots. In addition, it meant someone who puts things into pots. Haik was still learning to make pots. But she was already a person who put stones or bones into pots, and this is not a trivial occupation, but rather a science. Never undervalue taxonomy. The foundation of all knowledge is fact, and facts that are not organized are useless.

Several years passed. Haik learned her teacher's skill, though her work lacked Rakai's elegance.

"It's the cliffs," said the old potter. "And the stones you bring back from them. They have entered your spirit, and you are trying to reproduce them in clay. I learned from plants, which have grace and symmetry. But you—"

One of Haik's pots was on the wheel: a squat, rough-surfaced object. The handles were uneven. At first, such things had happened due to lack of skill, but she found she liked work that was a little askew. She planned a colorless, transparent glaze that would streak the jar—like water seeping down a rock face, Haik suddenly realized.

"There's no harm in this," said Rakai. "We all learn from the world around us. If you want to be a potter of stones, fine. Stones and bones, if you are right and the things you find *are* bones. Stones and bones and shells."

The old potter hobbled off. Should she break the pot, Haik wondered. Was it wrong to love the cliffs and the objects they contained? Rakai had told her no. She had the old potter's permission to be herself. On a whim, Haik scratched an animal into the clay. Its head was like a hammer, with large eyes at either end—on the hammer's striking surfaces, as Haik explained it to herself. The eyes were faceted; and the long body was segmented. Each segment had a pair of legs, except for the final segment, which had two whip-like tails longer than the rest of the animal. No one she had met, not travelers to the most distant places nor the most outrageous liars, had ever described such an animal. Yet she had found its remains often, always in the cliffs' lower regions, in a kind of rock she had named "far-down dark grey."

Was this one of the Goddess's jokes? Most of the remains were damaged; only by looking carefully had she found intact examples; and no one else she knew was interested in such things. Had the Goddess built these cliffs and filled them with remains in order to fool Tulwar Haik?

Hardly likely! She looked at the drawing she'd made. The animal's body was slightly twisted, and its tails flared out on either side. It seemed alive, as if it might crawl off her pot and into Tulwar Harbor. The girl exhaled, her heart beating quickly. There was truth here. The creature she had drawn must have lived. Maybe it still lived in some distant part of the ocean. (She had found it among shells. Its home must be aquatic.) She refused to believe such a shape could come into existence through accident. She had been mixing and kneading and spinning and dropping clay for years. Nothing like this had ever appeared, except through intent. Surely it was impious to argue that the Goddess acted without thought. This marvelous world could not be the result of the Great One dropping the stuff-of-existence or squishing it aimlessly between her holy fingers. Haik refused to believe the animal was a joke. The Goddess had better things to do, and the animal was beautiful in its own strange way. Why would the Goddess, who was humorous but not usually malicious, make such an intricate and lovely lie?

Haik drew the animal on the other side of the pot, giving it a slightly different pose, then fired the pot and glazed it. The glaze, as planned, was clear and uneven, like a film of water running down the pot's dark grey fabric.

As you know, there are regions of the world where families permit sex among their members, if the relationship is distant enough. The giant families of the third continent, with fifty or a hundred thousand members, say there's nothing wrong with third or fourth or fifth cousins becoming lovers, though inbreeding is always wrong. But Haik's family did not live in such a region; and their lineage was so small and lived so closely together, that no one was a distant relative.

For this reason, Haik did not experience love until she was twenty and went down the coast on a trading ship to sell pots in Tsugul.

This was an island off the coast, a famous market in those days. The harbor was on the landward side, protected from ocean storms. A town of wood and plaster buildings went down slopes to the wooden warehouses and docks. Most of the plaster had been painted yellow or pale blue. The wood, where it showed, was dark blue or red. A colorful town, thought Haik when she arrived, made even more colorful by the many plants in pots. They stood on terraces and rooftops, by doorways, on the stairway streets. A good place to sell Rakai's work and her own.

In fact, she did well, helped by a senior forester who had been sent to sell the Tulwar's other product.

"I'd never say a word against your teacher, lass," he told her. "But your pots really set off my trees. They, my trees, are so delicate and brilliant; and your pots are so rough and plain. Look!" He pointed at a young crown-of-fire, blossoming in a squat black pot. "Beauty out of ugliness! Light out of darkness! You will make a fortune for our family!"

She didn't think of the pot as ugly. On it, in relief, were shells, blurred just a bit by the iron glaze. The shells were a series, obviously related, but from different parts of the Tulwar cliffs. Midway up the cliffs, the first place she found them, the shells were a single plain coil. Rising from there, the shells became ever more spiny and intricate. This progression went in a line around the pot, till a spiked monstrosity stood next to its straightforward ancestor.

Could Haik think this? Did she already understand about evolution? Maybe not. In any case, she said nothing to her kinsman.

That evening, in a tavern, she met a sailor from Sorg, a tall thin arrogant woman, whose body had been shaved into a pattern of white fur and black skin. They talked over cups of *halin.* The woman began brushing Haik's arm, marveling at the red fur. "It goes so well with your green eyes. You're a young one. Have you ever made love with a foreigner?"

"I've never made love," said Haik.

The woman looked interested, but said, "You can't be that young."

Haik explained she'd never traveled before, not even to neighboring towns. "I've been busy learning my trade."

The Sorg woman drank more *halin.* "I like being first. Would you be interested in making love?"

Haik considered the woman, who was certainly exotic looking. "Why do you shave your fur?"

"It's hot in my home country; and we like to be distinctive. Other folk may follow each other like city-building bugs. We do not!"

Haik glanced around the room and noticed other Sorg women, all clipped and shaved in the same fashion, but she did not point out the obvious, being young and polite.

They went to the Sorg woman's ship, tied at a dock. There were other couples on the deck, all women.

"We have a few men in the crew this trip," her sexual partner said. "But they're all on shore, looking for lovers; and they won't be back till we're ready to lift anchor."

The experience was interesting, Haik thought later, though she had not imagined making love for the first time on a foreign ship, surrounded by other couples, who were not entirely quiet. She was reminded of fish, spawning in shallow water.

"Well, you seemed to enjoy that," said the Sorg woman. "Though you are a silent one."

"My kin say I'm thoughtful."

"You shouldn't be, with red fur like fire. Someone like you ought to burn."

Why? wondered Haik, then fell asleep and dreamed that she was talking with an old woman dressed in a plain, rough tunic. The woman's feet were muddy. The nails on her hands were untrimmed and long, curling over the tips of her fingers like claws. There was dirt under the nails. The old woman said, "If you were an animal, instead of a person, you would have mated with a male; and there might have been children, created not as the result of a breeding contract, but out of sexual passion. Imagine a world filled with that kind of reproduction! It is the world you live in! Only people use reason in dealing with sex. Only people breed deliberately."

She woke at dawn, remembering the dream, though it made little sense. The woman had seemed like a messenger, but her message was obvious. Haik kissed the Sorg woman goodby, pulled on her tunic and stumbled down the gangway. Around her the air was cold and damp. Her feet left prints on dew-covered wood.

She had sex with the Sorg women several more times. Then the foreign ship lifted anchor, and Haik's lover was gone, leaving only a shell necklace.

"Some other woman will have to make you burn," the lover said. "But I was the first, and I want to be remembered."

Haik thanked her for the necklace and spent a day or two walking in the island's hills. The stone here was dark red and grainy and did not appear to contain fossils. Then she and her kinsman sailed north.

After that, she made sure to go on several trips a year. If the ship was crewed by women, she began looking for lovers as soon as she was on board. Otherwise, she waited till they reached a harbor town. Sometimes she remained with a single lover. At other times, she went from one to another or joined a group. Her childhood nickname, long forgotten, came back to her, though now she was known as "Fire," rather than "Crown-of-Fire." She was a flame that burned without being burned.

"You never feel real affection," one lover told her. "This is nothing but sex for you."

Was this true? She felt affection for Rakai and her family at home and something approaching passion for her work with clay and stone. But these women?

As we know, men are more fervent and loyal lovers than women. They will organize their lives around affection. But most women are fond of their lovers and regret leaving them, as they usually must, though less often in modern times; and the departures matter less now, since travel has become so rapid. Lovers can meet fifty times a year, if they're willing to pay the airfare.

Haik enjoyed sex and her sexual partners, but left with no regrets, her spirit untouched.

"All your fire is in your sexual parts," another partner said. "Nothing burns in your mind."

When she was twenty-five, her family decided to breed her. There was no way she could refuse. If the Tulwar were going to survive, every healthy female had to bear children. After discussion, the senior women approached the Tsugul, who agreed to a mating contract. What happened next Haik did not like to remember. A young man arrived from Tsugul and stayed with

her family. They mated till she became pregnant, then he was sent home with gifts: fine pots mostly, made by her and Rakai.

"I won't have children in my pottery," Rakai said.

"I will give the child to one of my cousins to raise," said Haik.

She bore female twins, dun colored with bright green eyes. For a while, looking at them, she thought of raising them. But this idea came from exhaustion and relief. She was not maternal. More than children, she wanted fossils and her pots. A female cousin took them, a comfortable woman with three children of her own. "Five is always lucky," she told Haik.

It seemed to be. All five children flourished like starflower trees.

Rakai lasted till Haik was almost thirty. In her last years, the old potter became confused and wandered out of her house, looking for long-drowned relatives or clay, though she had turned clay digging over to Haik a decade before. One of these journeys took place in an early winter rain. By the time the old woman was found, she was thoroughly drenched and shaking with cold. A coughing sickness developed and carried her away. Haik inherited the pottery.

By this time, she had developed a distinctive style: solid, squat pots with strange creatures drawn on them. Sometimes, the handles were strange creatures made in molds: clawed birds or animals like flowers with thick, segmented stalks. Haik had found fossils of the animals still grasping prey. In most cases, the prey was small fish, so the creatures had been marine predators. But her customers thought they were flowers—granted, strange ones, with petals like worms. "What an imagination you have!"

The pots with molded handles were fine work, intended for small expensive plants. Most of her work was large and sturdy, without handles that could break off. Her glazes remained plain: colorless or black.

Though she was a master potter, her work known up and down the coast, she continued hunting fossils. Her old teacher's house became filled with shelves; and the shelves became filled with pieces of stone. Taking a pen, Haik wrote her name for each creature on the shelf's edge, along with the place where she'd found this particular example. Prowling through the rooms by lantern light, she saw eons of evolution and recognized what she saw. How could she fail to, once the stones were organized?

The first shelves held shells and faint impressions of things that might be seaweed. Then came animals with many limbs, then fish that looked nothing like any fish she'd ever seen. Finally came animals with four limbs, also strange. Most likely, they had lived on land.

She had a theory now. She knew that sand and clay could become solid in the right circumstances. The animals had been caught in muck at the ocean's bottom or in a sand dune on land. Through a process she did not understand, though it must be like the firing of clay in a kiln, the trapping material turned to stone. The animal vanished, most likely burnt up, though it might also have decayed. If nothing else happened, the result was an impression. If the hollow space in the stone became filled, by some liquid seeping in and leaving a deposit, the result was a solid object. Her clawed bird was an impression. Most of her shells were solid.

Was she too clever? Could no one in her age imagine such a theory?

Well, she knew about clay, about molds, about minerals suspended in water. What else is a glaze? There were people in her village who worked with mortar, which is sand that hardens. There were people in nearby villages who used the lost wax process to cast.

All the necessary information was present. But no one except Haik used

it to explain the objects in the Tulwar cliffs. Why? Because her kin had barely noticed the fossils and were not curious about them, did not collect them and label them and prowl around at night, looking at the pieces of stone and thinking.

Life had changed through time. It went from the very odd to the less odd to the almost familiar. In a few places on the cliff tops were animals that still lived. So, the process that led to the creation of fossils was still happening or had stopped happening recently.

How much time had this taken? Well, the old people in her town said that species did not change; and as far as she knew, there were no traditions that said animals used to be different. Oh, a few stories about monsters that no one had seen recently. But nothing about strange shells or fish. So the time required for change was longer than the memories of people.

Think of what she had learned and imagined! A world of vast periods of time, of animals that changed, of extinction. Hah! It frightened her! Was there any reason why her people might not vanish, along with the fish and plants they knew? Their lineage was small, its existence precarious. Maybe all life was precarious.

One night she had a dream. She was standing atop the cliffs above Tulwar Town. The houses below her looked very distant, unreachable. There was nothing around her except space, stretching up and down and east over the ocean. (The forest was behind her, and she did not turn around.) Next to her stood an old woman with white fur and dirty feet. "You've come a long way," she said. "Maybe you ought to consider turning back."

"Why?" asked Haik.

"There is no point in your journey. No one is going to believe you."

"About what?"

"My creatures."

"Are you the Goddess?" asked Haik.

The woman inclined her head slightly.

"Shouldn't you look more splendid?"

"Did Rakai look splendid? She worked in clay. I work in the stuff-of-existence. I wouldn't call it clean work, and who do I need to impress?"

"Have things really died out? Or do they exist somewhere in the world?"

"I'm not going to answer your questions," the old woman said. "Figure existence out for yourself."

"Do you advise me to turn back?"

"I never give advice," the Goddess said. "I'm simply telling you that no one will believe you about time and change. Oh, one or two people. You can get some people to believe anything, but sensible people will laugh."

"Should I care?" Haik asked.

"That's the question, isn't it?" the Goddess said. "But as I've said already, I don't give advice."

Then she was gone, and Haik was falling. She woke in bed in Rakai's house. Outside her window, stars blazed and gave her no comfort.

She thought about her dream for some time, then decided to go on a voyage. Maybe her problem was lack of sex. Her best pots went into wicker baskets, wrapped in straw, along with large plates, some plain, but most with strange creatures painted on them: her lovely bird with claws, the many-legged bugs, fish that wore plate armor instead of scales, and quadrupeds with peculiar horny heads.

When a ship arrived, going north, she took passage. It was crewed by

Batanin women, so she had plenty of sex before she reached their destination. But the feeling of loneliness and fear remained. It seemed as if she stood on the edge of an abyss, with nothing around her or below her.

She got off in a harbor town inhabited by the Meskh, a good-sized family. Although they had a port, they were farmers mostly, producing grain and dried fruit for export, along with excellent *halin*.

Her pottery brought good prices in Meskh Market. By this time, she was famous as the Strange Animal Potter or The Potter of Shells and Bones.

"You are here in person," her customers said. "This is wonderful! Two famous women in town at once!"

"Who is the other?" Haik asked.

"The actor Dapple. Her troop has just given a series of plays. Now, they're resting, before continuing their tour. You must meet her."

They met that night in a tavern. Haik arrived escorted by several customers, middle-aged women with dark fur. At a table in the middle of the room, surrounded by dark Meskh women, was someone tall and slender, broad shouldered, her fur pale silver. Introductions were made. The actor stood. In lantern light, Haik could see the silver fur was dappled with small, dim spots. It was rare for people to keep their baby markings, but a few did.

"Hah! You're a lovely one," the actor said. "Red fur is unusual in this part of the world."

Haik sat down and told the story of her father, then how her mother died and how she had grown up in Tulwar Town. When she finally stopped, she saw the Meskh women were gone. She and Dapple sat alone at the table under the flaring lamp.

"What happened?" Haik asked.

"To the others? Most had the good sense to leave. Those who did not were removed by members of my company."

"And I didn't notice?"

"I don't believe," said Dapple, stretching, "that you are a person who notices much outside your interests. The Meskh have loaned us a house. Why don't you come there with me? We can drink more *halin* and talk more, if you wish. Though I have spent the past half an *ikun* imagining what you look like without clothing."

They went to the house, walking side by side through the dark streets. Inside, in a courtyard full of potted trees and lit by stars, they made love. Dapple pulled some blankets and pillows out of a room, so they weren't uncomfortable. "I have spent too much of my life sleeping on hard ground," the actor said. "If I can avoid discomfort, I will." Then she set to work with extraordinary skillful hands and a mouth that did not seem to belong to an ordinary woman made of flesh, but rather to some spirit out of ancient stories. The Fulfilling Every Wish Spirit, thought Haik. The Spirit of Almost Unendurable Pleasure.

The potter tried to reciprocate, though she knew it was impossible. No one, certainly not her, could equal Dapple's skill in love. But the actor made noises that indicated some satisfaction. Finally, they stopped. The actor clasped her hands in back of her head and looked at the stars. "Can you give me a pot?"

"What?" asked Haik.

"I've seen your work before this, and I would like a keepsake, something to remember you."

At last the flame felt burning. Haik sat up and looked at the long pale figure next to her. "Is this over? Do we have only this night?"

"I have engagements," Dapple said. "We've arranged our passage on a ship that leaves tomorrow. Actors don't have settled lives, Haik. Nor do we usually have permanent lovers."

As in her dream, Haik felt she was falling. But this time she didn't wake in her bed, but remained in the Meskh courtyard.

The Goddess was right. She should give up her obsession. No one cared about the objects she found in cliffs. They did care about her pottery, but she could take leave of pots for a while.

"Let me go with you," she said to Dapple.

The actor looked at her. "Are you serious?"

"I have done nothing since I was fifteen, except make pots and collect certain stones I have a fondness for. More than fifteen years! And what do I have to show? Pots and more pots! Stones and more stones! I would like to have an adventure, Dapple."

The actor laughed and said, "I've done many foolish things in my life. Now, I'll do one more. By all means, come on our journey!" Then she pulled Haik down and kissed her. What a golden tongue!

The next morning, Haik went to her ship and gathered her belongings. They fit in one basket. She never traveled with much, except her pots, and they were sold, the money in a heavy belt around her waist.

Next she went to the harbor mistress. Sitting in the woman's small house, she wrote a letter to her relatives, explaining what had happened and why she wasn't coming home.

"Are you sure this is a good idea?" the mistress said as Haik rolled the letter and put it in a message tube, then sealed the tube with wax.

"Yes." The letter was to go south on the next ship, Haik told the mistress. She gave the woman half her money to hold, till the Tulwar came to claim it.

"This is a foolish plan," the harbor mistress said.

"Have you never been in love?" Haik asked.

"Not this much in love, I'm glad to say."

Haik had started for the door. Now she stopped. The shutters on the room's windows were open. Haik was in a beam of light. Her red fur shone like fire. Her eyes were as clear and green as a cresting ocean wave. Hah! thought the harbor mistress.

"I'm thirty-two and have never been in love, until last night," Haik said. "It has come to me recently that the world is a lonely place." She slung her basket on her back and walked toward Dapple's borrowed house.

A strange woman, thought the harbor mistress.

The actors' ship left on the afternoon tide, Haik with them, standing on the deck, next to her new love.

At this point, the story needs to describe Dapple. She was forty when Haik met her, the first woman to train as an actor and the first person to assemble an acting company made of women. Her early years had been difficult; but by this time, she was successful and self-confident, a fine actor and even better playwright. Some of her writing has come forward to us, though only in a fragmentary condition. Still, the words shine like diamonds, unscratched by fate.

Dapple was her acting name. Her real name was Helwar Ahl, and her home—which she rarely visited—was Helwar Island, off the northeast corner of the Great Southern Continent. For the most part, she and her company traveled up and down the continent's eastern coast, going as far south as Ettin, where she had many friends.

They were going south now and could have taken Haik's letter, though Haik hadn't known this. In any case, their ship was a fast trader, bound for Hu and not planning to stop on the way. East they went, till the coast was a thin dark line, visible only when the ship crested a wave. The rest of the time, they were alone, except for the *peshadi* that swam in front of them and the ocean birds that followed.

The birds were familiar to Haik, but she had never seen a live *pesha* before. As the animals' sleek backs broke the water's surface, they exhaled loudly enough so Haik had no trouble hearing the sound. *Wah! Wah!* Then they dove, their long tails cutting through the water like knives. They had a second name: blue fish, which came from their hide's deep ocean color. Neither death nor tanning dimmed the hue, and *pesha* leather was a famous luxury.

"I had a pair of *pesha* boots once," said Dapple. "A wealthy matron gave them to me, because they were cracked beyond repair. I used them in plays, till they fell into pieces. You should have seen me as a warrior, strutting around in those boots!"

Years before, a dead *pesha* had washed up on a beach in Tulwar. They'd all gone to see it: this deep-sea animal their kin had hunted before the Drowning. It had been the size of a large woman, with four flippers and a tail that looked like seaweed, lying limp on the pebbles. The old men of Tulwar cut it up. Most of the women went back to work, but Haik stayed and watched. The flesh had been reddish-purple, like the flesh of land animals; the bones of the skeleton had been large and heavy. As for the famous skin, she'd felt it. Not slimy, like a fish, and with no scales, though there were scaleless fish. She knew that much, though her kin no longer went to sea.

Most interesting of all were the flippers. She begged a hind one from the old men. It was small, the hide not usable, with almost no flesh on the bones. "Take it," her senior male relatives told her. "Though nothing good is likely to come from your curiosity."

Haik carried it to her teacher's house, into a back room that Rakai never entered. Her fossils were there, along with other objects: a bird skeleton, almost complete; the skulls of various small animals; and shells from Tulwar's beaches. Laying the flipper on a table, she used a sharp knife to cut it open. Inside, hidden by blue skin and reddish-purple flesh, were five rows of long, narrow, white bones.

She had cleaned them and arranged them on the table as she'd found them in the flipper. The two outer rows were short, the thumb—could she call it that?—barely present, while the three middle rows were long and curved. Clearly, they provided a framework for the flipper. What purpose did the outer rows serve, and why had the Goddess hidden a hand inside a sea animal's flipper?

"Well," said Dapple after Haik told this story. "What's the answer to your question?"

"I don't know," said Haik, afraid to talk about her theories. What did she know for certain? A group of puzzling facts. From these she had derived a terrifying sense of time and change. Did she have the right to frighten other people, as she had been frightened?

Beside them, a *pesha* surfaced and exhaled, rolling sideways to eye them and grin with sharp white teeth.

"Rakai told me the world is full of similarities and correspondences. The Goddess is a repeater. That's what they always told me."

"And a jokester," said Dapple. "Maybe she thought it would be funny to make something that was a fish in some ways and a land animal in others."

"Maybe," Haik said in a doubtful tone. "I tanned the flipper hide and made a bag from it, but couldn't use the bag. It seemed dishonorable and wrong, as if I was using the skin from a woman's hand to keep things in. So I put the *pesha* bones in the bag and kept them on one of my shelves; and I made a pot decorated with *peshadi*. It was a failure. I didn't know how living *peshadi* moved. Now, I will be able to make the pot again."

Dapple ruffled the red fur on her shoulder. "Like fire," the actor said gently. "You burn with curiosity and a desire to get things right."

"My relatives say it will get me in trouble."

"The Goddess gave us the ability to imagine and question and judge," the actor said. "Why would she have done this, if she did not intend us to use these abilities? I question the behavior of people; you question rocks and bones. Both activities seem *chulmar* to me."

Then as now, *chulmar* meant to be pious and to be funny. Dapple's voice sounded amused to Haik; this made her uneasy. In Tulwar, after the Drowning, piety took the form of glumness, though the people there certainly knew the meaning of *chulmar*. They did not mean to turn their children away from enjoyment of the world, but so much had been lost; they had become afraid; and fear is the end of piety.

The ship continued south, till it was far past the Tulwar coast. During this period, Haik was preoccupied with love. Hah! It had struck her like a strong blow in battle! She could think of little except Dapple's body: the four breasts, surprisingly large for a woman who'd never borne children; the rangy limbs; the prominent nipples, the same color as the "far-down dark grey" strata at home; and the place between the actor's legs, which was a cave of pleasure. Haik could model a breast in clay, make a covered pot of it, with a nipple for the handle. But how could she replicate the hidden place? Or Dapple's mouth with its golden tongue? It could not be done, especially now, with her kiln far behind her. Better not to think of pottery.

They made love often, usually on deck, under blazing tropic stars. She was drunk with love! Love had made her crazy, and she did not care!

Five days south of Tsugul Island, the ship turned west. They came to the wide harbor at Hu, guarded by white shoals. The *peshadi* were gone by then; the birds had become more numerous. A low green coast emerged from misty rain.

Haik and Dapple were on deck. Peering forward, Haik made out the buildings of Hu Town: white and blue, with red or green roofs. Fishing boats lined the harbor docks. Their furled sails were red, white, green, and yellow. "A colorful country."

"That's the south," said Dapple in agreement. As lovely as always, the actor was leaning on the ship's rail, looking happy. "People in the north call these folk barbarians, who lack refinement and a sense of nuance. But drama is not made of nuance." She raised an arm and brought it down. "It's the sword blade descending, the cry of understanding and anger and pain. I could not write the plays I write, if I didn't visit the south."

They tied up among the fishing boats, empty in mid-afternoon. The acting company went on shore, Tulwar Haik among them. She had never been this far south. The people in the streets, dressed in bright tunics and kilts, were an unfamiliar physical type: broad chested, with short thick limbs. The women were taller than women in the north, towering a full head above

their male relatives. Everyone had grey fur, and Haik got many sideways glances.

"I could lose you," said Dapple with amusement.

"They're ugly," said Haik.

"They are different, dear one. When you get used to them, they will begin to look handsome."

"Have you had lovers here?"

Dapple laughed. "Many."

Their destination was an inn built around a courtyard. There were potted trees in the courtyard: skyflower and starflower and a kind Haik did not recognize, which had silver-blue leaves and frilly, bright yellow flowers. Several of the pots had been made by Rakai; one had been made by her, an early work, not bad in its way. She pointed it out to Dapple.

The innkeeper appeared, a huge woman with arms like tree limbs and four enormous breasts, barely concealed by a vest. "My favorite customer!" she cried. "Are you going to perform?"

"Most likely, yes. Haik, this is Hu Aptsi." Dapple laid a hand on Haik's red shoulder. "And this beauty is my new lover, Tulwar Haik the potter. She has given up her pots to travel with me, until we tire of each other."

"Never!" said Haik.

"Excellent work you do in Tulwar," the innkeeper said. "I have neighbors who say nothing good comes from the north. Dapple and pots and flowering trees, I say."

They went into the common room and settled around tables. A round clay hearth bulged out of one wall. Logs burned in it. The innkeeper brought a large metal bowl, filling it with fruit juices and *halin,* then heated an iron rod in the fire and put the glowing tip in the full bowl. The liquid hissed and steamed. The innkeeper served. Haik wrapped her hands around a hot cup, sniffing the aromatic steam, thinking, *I am far from home, among strangers, about to drink something for which I have no name.* She tasted the liquid. Delicious!

"It will make you drunk quickly," said Dapple in a warning tone.

Beyond the room's windows, rain fell in the courtyard, and the potted trees quivered. *I am happy,* Haik thought.

That night, as she lay in Dapple's arms, she had a dream. The old woman came to her again, this time with clean hands and feet. "Existence is made to be enjoyed. Always remember that."

"Why did you kill my mother and my other relatives?" Haik asked.

"A storm killed them. Do you think every gust of wind is my breath? Do you think it's my hand that crushes every bug and pulls every bird from the sky?"

"Why did you make things that die?"

"Why do you work in clay? Sooner or later, all your pots will break."

"I like the material."

"I like life," the Goddess said. "And change."

The next day, Haik helped the actors set up their stage in a warehouse near the docks. Rain still fell. They would not be able to perform outside. The acting company was large: ten women, all from northern towns. Five were full members of the company. Three were apprentices. One was a carpenter; one made the costumes; though both of these last could fill small parts when needed. They all worked together easily. It was Haik who was awkward and needed to be told what to do. "You will learn," said Dapple.

Midway through the morning, she disappeared. "Off to write," said the carpenter. "I could see her thinking. These southerners like rude plays, and that isn't the kind of thing we usually do, except when we're down here. You'd think they'd like hero plays; they have plenty of real heroes among them. But no, they want comedy with lots of penises."

Haik could think of nothing to say.

They ate their evening meal in the inn, a light one, since acting should never be done on a full stomach. Then they went back to the warehouse, through still-falling rain. There were lamps on the walls around the stage. The wide, dark space beyond the lamplight was full of people. The air stank of oil, damp fur, and excitement.

"We know our business," said Dapple. "You keep off to the side and watch."

Haik did as told, leaning against a side wall, below a lamp that cast a yellow, flickering glow. Because she rarely thought about her appearance, she did not realize how she looked, her red fur and green eyes shining. Half the women in the audience wanted to have sex with her; half the men wished she were male. How could a woman of her age be so naïve? By thinking too much and living too long in the glum family Tulwar became after the Drowning.

The play was about a *sul* with an enormous penis. Dapple played him in an animal mask. The penis, of which he was so proud, was longer than she was and limp, so it dragged on the ground. The *sul* tripped over it often, while he bragged about his masculine power and the lovers he'd had, all men of extraordinary beauty and talent. Once he was established as an irritating braggart, a *tli* appeared, played by the company's second actor. The two animals got into a betting contest, and the *tli* won the *sul*'s penis, which struck the audience as funny. Getting it off was a problem, which struck the audience as even funnier. Finally, the *sul* stormed off, bereft of his male member and vowing revenge.

Now the *tli* delivered a soliloquy, while holding the huge limp object. Fine to win, the *tli* said, but he had no use for a penis this large. His own was adequate for his purposes; and the *sul* would come back with friends and weapons to reclaim the penis. This was the problem with giving in to irritation. What was he to do? How could he escape the vengeance of the *sul?*

At this point, Dapple reappeared, wearing a sleek blue mask, the open mouth full of sharp white teeth. She was a *pesha,* she announced, an early version of this species. She lived in shallow water, paddling and catching fish. She wanted to move into the ocean, but her tail was too small; she needed a new one, able to drive her deep into the water or far out over the waves.

"I have just the thing," said the *tli,* and showed her the *sul*'s penis. "We'll sew this on your backside, and you'll swim like a fish. But in return for this gift, you must carry me to safety; and once you are able to dive deeply, I wouldn't mind having some of the treasure that's sunk in the ocean."

The *pesha* agreed, and the two animals attached the penis to the back of Dapple's costume. Then she did a dance of happiness, singing praise of the ocean and her new life.

The other actors joined them with blue and white banners, which mimicked the motion of water, through which Dapple and the *tli* escaped, dancing and singing.

When everyone was gone, and the stage was bare, Dapple returned as the *sul,* along with two more *sulin.* "Foiled!" they cried. "We can't follow. Your

penis is assuredly gone, dear relative. You are not going to be socially popular in the future."

That was the end of the play, except for a final dance, done by the *tli,* surrounded by the rest of the cast, waving golden banners. These represented the treasure he had gained. As for the grateful *pesha,* she was happy in her new home, and with luck the penis would not retain any of its old qualities.

The audience stamped their feet and made hooting noises. Clearly, the play had gone over well.

Haik thought, yes, she was certain that things could turn into other things. But not, in all likelihood, a penis into a tail. And change was not a result of trickery, but time.

People came to talk with the main actors. Haik helped the carpenter and costume maker clean up.

"Ettin Taiin," said the carpenter. "I didn't know he was in town."

"Who?" asked Haik, putting the *tli* mask in a box.

"The lame man."

She looked around and saw a short fellow limping toward the stage. His fur was grey, turning silver over the shoulders and on the face. One eye was missing; he didn't bother to wear a patch over the empty socket.

"He is the foremost war captain among the Ettin," the carpenter said. "And they are the most dangerous lineage in this part of the world. Dapple calls his mother 'great-aunt.' If you find him scary, as I do, then you ought to meet the old lady!"

There was no way for him to reach Dapple, surrounded by admirers. He greeted the carpenter and the costume maker by name, without glancing at them directly. Good manners, thought Haik.

"Is Cholkwa with you?" asked the costume maker.

"South, among the savages of the Cold Ocean Coast. I sent men with him for protection, in case the savages didn't like his comedies. May I ask about your companion, or is that rude?"

"We can hardly object to rudeness, after the play we've done," said the carpenter.

"I laughed so hard I thought I would lose control of my bladder," said the one-eyed man.

The costume maker said, "This is Tulwar Haik the potter. She's Dapple's new lover."

The man lifted his head, apparently in surprise. Haik got a glimpse of his sunken eye socket and the remaining eye, which blazed blue as a noon sky. His pupil had expanded in the dim light and lay across the eye like an iron bar. "The Potter of Strange Animals," he said.

"Yes," said Haik, surprised to be known in this distant place.

"The world is full of coincidences!" the soldier told her. "And this one is pleasant! I bought one of your pots for my mother last year. She can barely see these days, but she likes the texture of it. She especially likes to feel the animals you have used for handles. Birds with clawed hands! What an idea! How can they possibly fly?"

"I don't think they did—or do," said Haik.

"These birds exist?" asked the soldier.

Haik paused, considering. "I have found their remains."

"You don't say. The world is full of two things, then: coincidence and strangeness. Considering the Goddess, this can't be called surprising." He glanced toward Dapple. Most of the admirers had gone. "Excuse me. I want

to give her news of Cholkwa. They just missed each other. His ship left two days ago; and I was planning to ride home, having stayed with him till the last *ikun*. But then I heard that Dapple had arrived."

He limped away.

"He and Cholkwa are lovers," said the carpenter. "Though the true love of Cholkwa's life is the actor Perig. Perig's old now and in poor health. He lives on Helwar Island with Dapple's kin, who are my kin also, while Cholkwa still travels. Male actors are as promiscuous as women."

Haik finished putting away the masks. The *pesha* mask was new, she realized. The blue paint was still tacky, and the shape of the head had been changed, using cloth and glue.

"We keep blank masks," said the carpenter. "Then, when Dapple has a sudden idea, we can add new animals."

"This is something I can do," Haik said. "Shape the masks and paint them." She glanced up at the carpenter and the costume maker. "Unless the work belongs to you."

"We all do many things," said the costume maker. "If you stay with us you'll find yourself on stage."

When everything was packed up, they went back to the inn, sat in the common room and drank *halin*. The Ettin captain, who came with them, had an immense capacity. He left from time to time to urinate, but never got noticeably drunk. The idea of coincidence was stuck in his mind, and he talked about how it worked in war, sometimes to his benefit, sometimes against him.

There was the time he went to attack the Gwa and met their warband on the way, coming to attack Ettin. "We both picked the same exact route. So there we were in a mountain pass, staring at each other with mouths open. Then we fought." He spilled *halin* on the table and drew the disposition of troops. "A bad situation for both of us! Neither had an advantage, and neither had a good way to retreat. I knew I had to win and did, though I lost an eye and a brother; and enough Gwa soldiers escaped, so we could not surprise them at home. A nasty experience, caused by coincidence. Doubtless the Goddess does this to us so we won't take our plans too seriously; a good captain must always be ready to throw his ideas away."

When he finally left, walking steadily except for his limp, Dapple said, "I have sworn to myself, I will put him in a play some day. That is what a hero is really like. I'll have to make up a new story, of course. His life has not been tragic. He's never had to make difficult choices, and everything he's wanted—fame, the affection of his relatives, the love of Cholkwa—has come into his hands."

Well, thought Haik, she was certainly learning new things. The man had not seemed like a hero to her.

The next evening, they did the play a second time. The warehouse was packed, and Ettin Taiin was in the audience again. Haik watched him as he watched the play, his expression intent. Now and then, he laughed, showing white teeth. One was missing, an upper stabber. Doubtless it had been lost in battle, like his eye and his leg's agility. Haik's male relatives fought nothing except the forest predators, which were not especially dangerous. When men died in the forest, it was usually from small creatures that had a poisonous bite or sting; or they died from accidents. Old people told stories about pirates, but none had attacked the northeast coast in more than a generation. The Tulwar feared water and storms.

Now, Haik thought, she was in the south. War was continuous here; and lineages vanished from existence, the men killed, the women and children adopted. A family that lacked soldiers like Ettin Taiin would not survive.

This idea led nowhere, except to the thought that the world was full of violence, and this was hardly a new thought. In front of her, Dapple tripped over the *sul*'s long dragging penis and tumbled into a somersault, which ended with her upright once again, the penis wound around her neck. The audience hooted its approval. The world was full of violence and sex, Haik thought.

Once again the captain joined them at the inn. This time he drank less and asked questions, first of the actors, then of Haik. Where exactly was her family? What did they produce besides pots?

"Are you planning to invade us?" she asked.

He looked shocked. "I am a soldier, not a bandit, young lady! I only fight with people I know. The purpose of war is to expand the size of one's family and increase the amount of land held by one's kin. That should always be done along existing borders. You push out and push out, gathering the land and the women and children immediately beyond your borders, making sure the land is always contiguous and protected—if possible—by natural barriers. Any other strategy leaves you with a territory that is not defensible."

"He's not planning to invade you," Dapple said in summary. "Your land is too far away."

"Exactly," the captain said. "Bandits and pirates use different tactics, since they want valuable objects rather than land and people. We've had both in the south and dealt with them."

"How?" asked Haik.

"The obvious way is to find where they came from, go there and kill all the men. The problem is, you have to do something with the bandit women and children. They can't be left to starve. But obviously no family wants members with bad traits."

"What do you do?"

"Adopt them, but spread them among many houses, and never let any of them breed. Often, the children turn out well; and after a generation, the traits—bad or good—are gone. This, as you can imagine, is a lot of work, which is a reason to kill enough men so the bandits will think twice about returning to Ettin, but leave enough alive so the women and children are provided for."

The carpenter was right. This was a frightening man.

Dapple said, "The Tulwar are foresters. For the most part, they export lumber and flowering trees. Haik makes pots for the trees."

"Do you have children?" the captain asked Haik.

"Two daughters."

"A woman with your abilities should have more. What about brothers?"

"None."

"Male cousins?"

"Many," said Haik.

The captain glanced at Dapple. "Would it be worthwhile asking a Tulwar man to come here and impregnate one of our women? Your lover's pots are really excellent; and my mother has always liked flowers. So do I, for that matter."

"It's a small family," said Dapple. "And lives far away. A breeding contract with them would not help you politically."

"There is more to life than politics," said the captain.

"The Tulwar men aren't much for fighting," said Haik, unsure that she wanted any connection with Ettin.

"You don't mean they're cowards?"

"Of course not. They work in our wild backcountry as foresters and loggers. They used to sail the ocean, before most of my family drowned. These kinds of work require courage, but we have always gotten along with our neighbors."

"No harm in that, if you aren't ambitious." He grinned, showing his missing tooth. "We don't need to breed for ambition or violence. We have those talents in abundance. But art and beauty—" His blue eye glanced at her briefly. "These are not our gifts, though we are certainly able to appreciate both."

"Witness your appreciation of Cholkwa," said Dapple, her tone amused.

"A great comedian. and the best-looking man for his age I've ever seen. But my mother and her sisters decided years ago that he should not be asked to father Ettin children. For one thing, he has never mentioned having a family. Who could the Ettin speak to, if they wanted a breeding contract? A man shouldn't make decisions like these. We do things the right way in Ettin! In any case, acting is not an entirely respectable art; who can say what qualities would appear among the Ettin, if our children were fathered by actors."

"You see why I have no children," Dapple said, then tilted her head toward the carpenter. "Though my kinswoman here has two sets of twins, because her gift is making props. We don't tell our relatives that she also acts."

"Not much," said the carpenter.

"And not well," muttered the apprentice sitting next to Haik.

The captain stayed a while longer, chatting with Dapple about his family and her most recent plays. Finally he rose. "I'm too old for these long evenings. In addition, I plan to leave for Ettin at dawn. I assume you're sending love and respect to my mother."

"Of course," said Dapple.

"And you, young lady." The one eye roved toward her. "If you come this way again, bring pots for Ettin. I'll speak to my mother about a breeding contract with Tulwar. Believe me, we are allies worth having!"

He left, and Dapple said, "I think he's imagining a male relative who looks like you, who can spend his nights with an Ettin woman and his days with Ettin Taiin."

"What a lot of hard work!" the carpenter said.

"There are no Tulwar men who look like me."

"What a sadness for Ettin Taiin!" said Dapple.

From Hu Town they went west and south, traveling with a caravan. The actors and merchants rode *tsina,* which were familiar to Haik, though she had done little riding before this. The carrying beasts were *bitalin*: great, rough quadrupeds with three sets of horns. One pair spread far to the side; one pair curled forward; and the last pair curled back. The merchants valued the animals as much as *tsina,* giving them pet names and adorning their horns with brass or iron rings. They seemed marvelous to Haik, moving not quickly, but very steadily, their shaggy bodies swaying with each step. When one was bothered by something—bugs, a scent on the wind, another *bital*—it would swing its six-horned head and groan. What a sound!

"Have you put *bitalin* in a play?" she asked Dapple.

"Not yet. What quality would they represent?"

"Reliability," said the merchant riding next to them. "Strength. Endurance. Obstinacy. Good milk."

"I will certainly consider the idea," Dapple replied.

At first the plain was green, the climate rainy. As they traveled south and west, the weather became dry, and the plain turned dun. This was not a brief journey. Haik had time to get used to riding, though the country never became ordinary to her. It was so wide! So empty!

The merchants in the caravan belonged to a single family. Both women and men were along on the journey. Of course the actors camped with the women, while the men—farther out—stood guard. In spite of this protection, Haik was uneasy. The stars overhead were no longer entirely familiar; the darkness around her seemed to go on forever; and caravan campfires seemed tiny. Far out on the plain, wild *sulin* cried. They were more savage than the domestic breeds used for hunting and guarding, Dapple told her. "And uglier, with scales covering half their bodies. Our *sulin* in the north have only a few small scaly patches."

The *sulin* in Haik's country were entirely furry, except in the spring. Then the males lost their chest fur, revealing an area of scaly skin, dark green and glittering. If allowed to, they'd attack one another, each trying to destroy the other's chest adornment. "Biting the jewels," was the name of this behavior.

Sitting under the vast foreign sky, Haik thought about *sulin.* They were all varieties of a single animal. Everyone knew this, though it was hard to believe that Tulwar's mild-tempered, furry creatures were the same as the wild animals Dapple described. Could change go farther? Could an animal with hands become a *pesha?* And what caused change? Not trickery, as in the play. Dapple, reaching over, distracted her. Instead of evolution, she thought about love.

They reached a town next to a wide sandy river. Low bushy trees grew along the banks. The merchants made camp next to the trees, circling their wagons. Men took the animals to graze, while the women—merchants and actors—went to town.

The streets were packed dirt, the houses adobe with wood doors and beams. (Haik could see these last protruding through the walls.) The people were the same physical type as in Hu, but with grey-brown fur. A few had faint markings—not spots like Dapple, but narrow broken stripes. They dressed as all people did, in tunics or shorts and vests.

Why, thought Haik suddenly, did people come in different hues? Most wild species were a single color, with occasional freaks, usually black or white. Domestic animals came in different colors. It was obvious why: people had bred them according to different ideas of usefulness and beauty. Had people bred themselves to be grey, grey-brown, red, dun and so on? This was possible, though it seemed to Haik that most people were attracted to difference. Witness Ettin Taiin. Witness the response of the Tulwar matrons to her father.

Now to the problems of time and change, she added the problem of difference. Maybe the problem of similarity as well. If animals tended to be the same, why did difference occur? If there was a tendency toward difference, why did it become evident only sometimes? She was as red as her father. Her daughters were dun. At this point, her head began to ache; and she understood the wisdom of her senior relatives. If one began to question anything—shells in rock, the hand in a *pesha*'s flipper—the questions would

proliferate, till they stretched to the horizon in every direction and *why, why, why* filled the sky, like the calls of migrating birds.

"Are you all right?" asked Dapple.

"Thinking," said Haik.

At the center of the town was a square, made of packed dirt. The merchants set up a tent and laid out sample goods: dried fish from Hu, fabric made by northern weavers, boxes carved from rare kinds of wood, jewelry of silver and dark red shell. Last of all, they unfolded an especially fine piece of cloth, put it on the ground and poured out their most precious treasure: a high, white, glittering heap of salt.

Townsfolk gathered: bent matriarchs, robust matrons, slim girls and boys, even a few adult men. All were grey-brown, except the very old, who had turned white.

In general, people looked like their relatives; and everyone knew that family traits existed. Why else select breeding partners with so much care? There must be two tendencies within people, one toward similarity, the other toward difference. The same must also be true of animals. Domestic *sulin* came in different colors; by breeding, people had brought out variations that must have been in the wild animals, though never visible, except in freaks. She crouched in the shadows at the back of the merchants' tent, barely noticing the commerce in front of her, thinking difficult thoughts.

Nowadays, geneticists tell us that the variation among people was caused by drift in isolated populations, combined with the tendency of all people to modify and improve anything they can get their hands on. We have bred ourselves like *sulin* to fit in different environments and to meet different ideas of beauty.

But how could Haik know this much about the history of life? How could she know that wild animals were more varied than she had observed? There are wild *sulin* in the far northern islands as thick furred and white as the local people. There is a rare, almost extinct kind of wild *sulin* on the third continent, which is black and entirely scaly, except for a ridge of rust-brown fur along its back. She, having traveled on only one continent, was hypothesizing in the absence of adequate data. In spite of this, she caught a glimpse of how inheritance works.

How likely is this? Could a person like Haik, living in a far-back era, come so near the idea of genes?

Our ancestors were not fools! They were farmers and hunters, who observed animals closely; and they achieved technological advances—the creation through breeding of the plants that feed us and the animals we still use, though no longer exclusively, for work and travel—which we have not yet equaled, except possibly by going into space.

In addition to the usual knowledge about inheritance, Haik had the ideas she'd gained from fossils. Other folk knew that certain plants and animals could be changed by breeding; and that families had traits that could be transmitted, either for good or bad. But most life seemed immutable. Wild animals were the same from generation to generation. So were the plants of forest and plain. The Goddess liked the world to stay put, as far as most people could see. Haik knew otherwise.

Dapple came after her, saying, "We need help in setting up our stage."

That evening, in the long summer twilight, the actors performed the *pesha* comedy. Dapple had to make a speech beforehand, explaining what a *pesha* was, since they were far inland now. But the town folk knew about

sulin, tli, and penises; and the play went well, as had the trading of the merchants. The next day they continued west.

Haik traveled with Dapple all summer. She learned to make masks by soaking paper in glue, then applying it in layers to a wooden mask frame.

"Nothing we carry is more valuable," said the costume maker, holding a thick white sheet of paper. "Use this with respect! No other material is as light and easy to shape. But the cost, Haik, the cost!"

The *bitalin* continued to fascinate her: living animals as unfamiliar as the fossils in her cliffs! Her first mask was a *bital.* When it was dry, she painted the face tan, the six horns shiny black. The skin inside the flaring nostrils was red, as was the tongue protruding from the open mouth.

Dapple wrote a play about a solid and reliable *bital* cow, who lost her milk to a conniving *tli.* The *tli* was outwitted by other animals, friends of the *bital.* The play ended with Dapple as the cow, dancing among pots of her recovered milk, turned through the ingenuity of the *tli* into a new substance: long-lasting, delicious cheese. The play did well in towns of the western plains. By now they were in a region where the ocean was a rumor, only half-believed; but *bitalin* were known and loved.

Watching Dapple's performance, Haik asked herself another question. If there was a hand inside the *pesha*'s flipper, could there be another hand in the *bital*'s calloused, two-toed foot? Did every living thing contain another living thing within it, like Dapple in the *bital* costume?

What an idea!

The caravan turned east when a plant called fire-in-autumn turned color. Unknown in Tulwar, it was common on the plain, though Haik had not noticed it till now. At first, there were only a few bright dots like drops of blood fallen on a pale brown carpet. These were enough to make the merchants change direction. Day by day, the color became more evident, spreading in lines. (The plant grew through sending out runners.) Finally, the plain was crisscrossed with scarlet. At times, the caravan traveled through long, broad patches of the plant, *tsina* and *bitalin* belly-deep in redness, as if they were fording rivers of blood or fire.

When they reached the moist coastal plain, the plant became less common. The vegetation here was mostly a faded silver-brown. Rain fell, sometimes freezing; and they arrived in the merchants' home town at the start of the first winter storm. Haik saw the rolling ocean through lashes caked with snow. The pleasure of salt water! Of smelling seaweed and fish!

The merchants settled down for winter. The actors took the last ship north to Hu Town, where the innkeeper had bedrooms for them, a fire in the common room and *halin* ready for mulling.

At midwinter, Dapple went to Ettin. Haik stayed by the ocean, tired of foreigners. It had been more than half a year since she'd had clay in her hands or climbed the Tulwar cliffs in search of fossils. Now she learned that love was not enough. She walked the Hu beaches, caked with ice, and looked for shells. Most were similar to ones in Tulwar; but she found a few new kinds, including one she knew as a fossil. Did this mean other creatures—her claw-handed bird, the hammer-headed bug—were still alive somewhere? Maybe. Little was certain.

Dapple returned through a snow storm and settled down to write. The Ettin always gave her ideas. "When I'm in the south, I do comedy, because the people here prefer it. But their lives teach me how to write tragedy; and tragedy is my gift."

Haik's gift lay in the direction of clay and stone, not language. Her journey south had been interesting and passionate, but now it was time to do something. What? Hu Town had no pottery, and the rocks in the area contained no fossils. In the end, she took some of the precious paper and used it, along with metal wire, to model strange animals. The colors were a problem. She had to imagine them, using what she knew about the birds and bugs and animals of Tulwar. She made the hammer-headed bug red and black. The flower-predator was yellow and held a bright blue fish. The claw-handed bird was green.

"Well, these are certainly different," said Dapple. "Is this what you find in your cliffs?"

"The bones and shells, yes. Sometimes there is a kind of shadow of the animal in the rock. But never any colors."

Dapple picked up a tightly coiled white shell. Purple tentacles spilled out of it; and Haik had given the creature two large, round eyes of yellow glass. The eyes were a guess, derived from a living ocean creature. But Haik had seen the shadow of tentacles in stone. Dapple tilted the shell, till one of the eyes caught sunlight and blazed. Hah! It seemed alive! "Maybe I could write a play about these creatures; and you could make the masks."

Haik hesitated, then said, "I'm going home to Tulwar.—"

"You are?" Dapple set down the glass-eyed animal.

She needed her pottery, Haik explained, and the cliffs full of fossils, as well as time to think about this journey. "You wouldn't give up acting for love!"

"No," said Dapple. "I plan to spend next summer in the north, doing tragedies. When I'm done, I'll come to Tulwar for a visit. I want one of your pots and maybe one of these little creatures." She touched the flower-predator. "You see the world like no one else I've ever met. Hah! It is full of wonders and strangeness, when looked at by you!"

That night, lying in Dapple's arms, Haik had a dream. The old woman came to her, dirty-footed, in a ragged tunic. "What have you learned?"

"I don't know," said Haik.

"Excellent!" said the old woman. "This is the beginning of comprehension. But I'll warn you again. You may gain nothing, except comprehension and my approval, which is worth little in the towns where people dwell."

"I thought you ruled the world."

"Rule is a large, heavy word," said the old woman. "I made the world and enjoy it, but rule? Does a tree rule the shoots that rise at its base? Matriarchs may rule their families. I don't claim so much for myself."

When spring came, the company went north. Their ship stopped at Tulwar to let off Haik and take on potted trees. There were so many plants that some had to be stored on deck, lashed down against bad weather. As the ship left, it seemed like a floating grove. Dapple stood among the trees, crown-of-fire mostly, none in bloom. Haik, on the shore, watched till she could no longer see her lover or the ship. Then she walked home to Rakai's pottery. Everything was as Haik had left it, though covered with dust. She unpacked her strange animals and set them on a table. Then she got a broom and began to sweep.

After a while, her senior relatives arrived. "Did you enjoy your adventures?"

"Yes."

"Are you back to stay?"

"Maybe."

Great-aunts and uncles glanced at one another. Haik kept sweeping.

"It's good to have you back," said a senior male cousin.

"We need more pots," said an aunt.

Once the house was clean, Haik began potting: simple forms at first, with no decoration except a monochrome glaze. Then she added texture: a cord pattern at the rim, crisscross scratches on the body. The handles were twists of clay, put on carelessly. Sometimes she left her hand print like a shadow. Her glazes, applied in splashes, hid most of what she'd drawn or printed. When her shelves were full of new pots, she went to the cliffs, climbing up steep ravines and walking narrow ledges, a hammer in hand. Erosion had uncovered new fossils: bugs and fish, mostly, though she found one skull that was either a bird or a small land animal. When cleaned, it turned out to be intact and wonderfully delicate. The small teeth, still in the jaw or close to it, were like nothing she had seen. She made a copy in grey-green clay, larger than the original, with all the teeth in place. This became the handle for a large covered pot. The body of the pot was decorated with drawings of birds and animals, all strange. The glaze was thin and colorless and cracked in firing, so it seemed as if a film of ice covered the pot.

"Who will buy that?" asked her relatives. "You can't put a tree in it, not with that cover."

"My lover Dapple," said Haik in reply. "Or the famous war captain of Ettin."

At midsummer, there was a hot period. The wind off the ocean stopped. People moved when they had to, mouths open, panting. During this time, Haik was troubled with dreams. Most made no sense. A number involved the Goddess. In one, the old woman ate an *agala*. This was a southern fruit, unknown in Tulwar, which consisted of layers wrapped around a central pit. The outermost layer was red and sweet; each layer going in was paler and more bitter, till one reached the innermost layer, bone-white and tongue-curling. Some people would unfold the fruit as if it were a present in a wrapping and eat only certain layers. Others, like Haik, bit through to the pit, enjoying the combination of sweetness and bitterness. The Goddess did as she did, Haik discovered with interest. Juice squirted out of the old woman's mouth and ran down her lower face, matting the sparse white hair. There was no more to the dream, just the Goddess eating messily.

In another dream, the old woman was with a female *bital*. The shaggy beast had two young, both covered with downy yellow fur. "They are twins," the Goddess said. "But not identical. One is larger and stronger, as you can see. That twin will live. The other will die."

"Is this surprising?" asked Haik.

The Goddess looked peeved. "I'm trying to explain how I breed!"

"Through death?" asked Haik.

"Yes." The Goddess caressed the mother animal's shaggy flank. "And beauty. That's why your father had a child in Tulwar. He was alive in spite of adversity. He was beautiful. The matrons of Tulwar looked at him and said, 'We want these qualities for our family.'

"That's why tame *sulin* are furry. People have selected for that trait, which wild *sulin* consider less important than size, sharp teeth, a crest of stiff hair along the spine, glittering patches of scales on the sides and belly, and a disposition inclined toward violence. Therefore, among wild *sulin*, these qualities grow more evident and extreme, while tame *sulin* acquire traits that enable them to live with people. The *pesha* once lived on land; the

bital climbed among branches. In time, all life changes, shaped by beauty and death.

"Of all my creatures, only people have the ability to shape themselves and other kinds of life, using comprehension and judgment. This is the gift I have given you: to know what you are doing and what I do." The old woman touched the smaller *bital* calf. It collapsed. Haik woke.

A disturbing dream, she thought, lying in darkness. The house, as always, smelled of clay, both wet and dry. Small animals, her fellow residents, made quiet noises. She rose and dressed, going to the nearest beach. A slight breeze came off the ocean, barely moving the hot air. Combers rolled gently in, lit by the stars. Haik walked along the beach, water touching her feet now and then. The things she knew came together, interlocking; she achieved what we could call the Theory of Evolution. Hah! The Goddess thought in large ways! What a method to use in shaping life! One could not call it quick or economical, but the Goddess was—it seemed by looking at the world—inclined toward abundance; and there was little evidence that she was in a hurry.

Death made sense; without it change was impossible. Beauty made sense; without it, there couldn't be improvement or at least variety. Everything was explained, it seemed to Haik: the *pesha*'s flipper, the claw-handed bird, all the animals she'd found in the Tulwar cliffs. They were not mineral formations. They had lived. Most likely, they lived no longer, except in her mind and art.

She looked at the cloudless sky. So many stars, past all counting! So much time, receding into distance! So much death! And so much beauty!

She noticed at last that she was tired, went home and went to bed. In the morning, after a bad night's sleep, the Theory of Evolution still seemed good. But there was no one to discuss it with. Her relatives had turned their backs on most of existence after the Drowning. Don't think badly of them for this. They provided potted beauty to many places; many lineages in many towns praised the Tulwar trees and pots. But their family was small, its future uncertain. They didn't have the resources to take long journeys or think about large ideas. So Haik made more pots and collected more fossils, saying nothing about her theory, till Dapple arrived late in fall. They made love passionately for several days. Then Dapple looked around at the largely empty town, guarded by dark grey cliffs. "This doesn't seem like a good place to winter, dear one. Come south with me! Bring pots, and the Ettin will make you very welcome."

"Let me think," said Haik.

"You have ten days at most," Dapple said. "A captain I know is heading south; I asked her to stop in Tulwar, in case your native town was as depressing as I expected."

Haik hit her lover lightly on the shoulder and went off to think.

She went with Dapple, taking pots, a potter's wheel, and bags of clay. On the trip south—through rolling ocean, rain and snow beating against the ship—Haik told Dapple about evolution.

"Does this mean we started out as bugs?" the actor asked.

"The Goddess told me the process extended to people, though I've never found the bones of people in my cliffs."

"I've spent much of my life pretending to be one kind of animal or another. Interesting to think that animals may be inside me and in my past!"

On the same trip, Haik said, "My family wants to breed me again. There

are too few of us; I'm strong and intelligent and have already had two healthy children."

"They are certainly right in doing this," said Dapple. "Have you picked a father?"

"Not yet. But they've told me this must be my last trip for a while."

"Then we'd better make the most of it," Dapple said.

There had been a family argument about the trip; and Haik had gotten permission to go only by saying she would not agree to a mating otherwise. But she didn't tell Dapple any of this. Family quarrels should be kept in the family.

They spent the winter in Hu. It was mild with little snow. Dapple wrote, and Haik made pots. Toward spring they went to Ettin, taking pots.

Ettin Taiin's mother was still alive, over a hundred and almost entirely blind with snow-white fur. But still upright, as Taiin pointed out. "I think she'll go to the crematorium upright and remain upright amid the flames."

He said this in the presence of the old lady, who smiled grimly, revealing that she'd kept almost all her teeth.

The Ettin bought all the pots Haik had, Taiin picking out one with special care. It was small and plain, with flower-predators for handles, a cover and a pure white glaze. "For my mother's ashes," the captain said quietly. "The day will come, though I dread it and make jokes about it."

Through late winter, Haik sat with the matriarch, who was obviously interested in her. They talked about pottery, their two families and the Theory of Evolution.

"I find it hard to believe we are descended from bugs and fish," Ettin Hattali said. "But your dreams have the sound of truth; and I certainly know that many of my distant ancestors were disgusting people. The Ettin have been improving, due to the wise decisions of my more recent ancestors, especially the women. Maybe if we followed this process far enough back, we'd get to bugs. Though you ought to consider the possibility that the Goddess is playing a joke on you. She does not always speak directly, and she dearly loves a joke."

"I have considered this," said Haik. "I may be a fool or crazy, but the idea seems good. It explains so much that has puzzled me."

Spring came finally. The hills of Ettin turned pale blue and orange. In the valley-fields, *bitalin* and *tsina* produced calves and foals.

"I have come to a decision," the blind old woman told Haik.

"Yes?"

"I want Ettin to interbreed with your family. To that end, I will send two junior members of my family to Tulwar with you. The lad is more like my son Taiin than any other male in the younger generation. The girl is a fine, intelligent, healthy young woman. If your senior female relatives agree, I want the boy—his name is Galhin—to impregnate you, while a Tulwar male impregnates Sai."

"It may be a wasted journey," said Haik in warning.

"Of course," said the matriarch. "They're young. They have time to spare. Dapple's family decided not to breed her, since they have plenty of children; and she is definitely odd. It's too late now. Her traits have been lost. But yours will not be; and we want the Ettin to have a share in what your line becomes."

"I will let my senior female relatives decide," said Haik.

"Of course you will," said Ettin Hattali.

The lad, as Hattali called him, turned out to be a man of thirty-five, shoul-

der high to Haik and steel grey. He had two eyes and no limp. Nonetheless, his resemblance to Taiin was remarkable: a fierce, direct man, full of good humor. Haik liked him at once. His half-sister Sai was thirty, a solid woman with grey-brown fur and an excellent, even temperament. No reasonable person could dislike her.

Dapple, laughing, said, "This is Ettin in action! They live to defeat their enemies and interbreed with any family that seems likely to prove useful."

Death and beauty, Haik thought.

The four of them went east together. Haik put her potter's tools in storage at the Hu Town inn; Dapple took leave of many old friends; and the four found passage on a ship going north.

After much discussion, Haik's senior relatives agreed to the two matings, impressed by Galhin's vigor and his sister's calm solidity, by the rich gifts the Ettin kin had brought, and Haik's description of the southern family.

Nowadays, with artificial insemination, we don't have to endure what happened next. But it was made tolerable to Haik by Ettin Galhin's excellent manners and the good humor with which he handled every embarrassment. He lacked, as he admitted, Taiin's extreme energy and violence. "But this is not a situation that requires my uncle's abilities; and he's really too old for mating; and it would be unkind to take him from Hattali. Who can say how long she will survive? Their love for each other has been a light for the Ettin for years. We can hardly separate them now."

The two foreigners were in Tulwar till fall. Then, both women pregnant, the Ettin departed. Haik returned to her pottery. In late spring, she bore twins, a boy and a girl. The boy died soon after birth, but the girl was large and healthy.

"She took strength from her brother in the womb," said the Tulwar matriarchs. "This happens; and the important child, the female, has survived."

Haik named the girl Ahl. She was dun like her older sisters, but her fur had more of a ruddy tint. In sunlight, her pelt shone red-gold; and her nickname became Gold.

It was two years before Dapple came back, her silver-grey fur beginning to show frost on the broad shoulders and lean upper arms. She admired the baby and the new pots, then gave information. Ettin Sai had produced a daughter, a strong child, obviously intelligent. The Ettin had named the child Haik, in hope that some of Tulwar Haik's ability would appear in their family. "They are greedy folk," said Dapple. "They want all their own strength, energy, solidity and violence. In addition, they want the beauty you make and are.

"Can you leave your daughter for a while? Come south and sell pots, while I perform my plays. Believe me, people in Hu and Ettin ask about you."

"I can," said Haik.

Gold went to a female cousin. In addition to being lovely, she had a fine disposition, and many were willing to care for her. Haik and Dapple took passage. This time, the voyage was easy, the winds mild and steady, the sky clear except for high, thin clouds called "tangled banners" and "schools of fish."

"What happened to your Theory of Evolution?" Dapple asked.

"Nothing."

"Why?"

"What could be done? Who would have believed me, if I said the world is

old beyond comprehension; and many kinds of life have come into existence; and most, as far as I can determine, no longer exist?"

"It does sound unlikely," Dapple admitted.

"And impious."

"Maybe not that. The Goddess has an odd sense of humor, as almost everyone knows."

"I put strange animals on my pots and make them into toys for Gold and other children. But I will not begin an ugly family argument over religion."

You may think that Haik lacked courage. Remember that she lived in an era before modern science. Yes, there were places where scholars gathered, but none in her part of the world. She'd have to travel long distances and learn a new language, then talk to strangers about concepts of time and change unfamiliar to everyone. Her proof was in the cliffs of Tulwar, which she could not take with her. Do you really think those scholars—people devoted to the study of history, mathematics, literature, chemistry, and medicine—would have believed her? Hardly likely! She had children, a dear lover, a craft, and friends. Why should she cast away all of this? For what? A truth no one was likely to see? Better to stay home or travel along the coast. Better to make pots on her own and love with Dapple.

They reached Hu Town in early summer. The inn's potted trees bloomed scarlet and sky-blue.

"The Potter of Strange Animals!" cried the innkeeper. "I have bought five of your pots for my trees."

Indeed, the woman had. Haik wandered around the courtyard, admiring her own work. Four were the kind she'd made when she first returned from the south, decorated with scratches and glazed white or black. The fifth had an underwater scene, done in low relief. Beaked fish swam around the top. Below them, rising from the bottom of the pot, were long sinuous plants. Haik had named them "ocean whips." It was possible that they were animals; once or twice she had found shadows that might be mouths with teeth. Between the plants (or animals) were segmented bugs. The glaze was dark blue with touches of white.

"This is more recent," Haik said.

"I bought it because you are the Potter of Strange Animals. But I prefer the other pots. They set off my trees."

Who can argue opinions about art, especially with someone who has bought five large pots?

Dapple's company was at the inn, having arrived several days before. Haik knew all of them, except the apprentices. For a while, they traveled through the little coastal towns of Hu, Tesh, and Ta-tesh, performing comedies and now and then a tragedy. These last were a surprise to Haik, especially the tragedies about women. They were so subdued! Instead of tumbling and rude jokes, there were small gestures, turned heads, a few words spoken quietly. The actors wore plain robes in sober colors; their faces were unmasked; most of the time, the music came from a single flute. Its sound reminded Haik of a thread floating on moving water, coiling and uncoiling in the current.

"It's my observation that women suffer as much as men," said Dapple in explanation. "But we are expected to be solid and enduring. As a result, our suffering is quiet. I'm trying to show it in the way it happens. Hah! I am tired of loud, rude comedies! And loud, sad plays about the suffering of men!"

At last, in far southern Tesh, they turned inland, traveling without merchants. The borders between Ettin and its eastern neighbors were all quiet. The various families had been allies and breeding partners for generations; and none tolerated criminal behavior. By now, it was late summer. The plain baked under a sun like polished brass. The Ettin hills were hot and dusty. When they reached Hattali's house, it was with relief. Household women greeted them. Men took their *tsina* and the packs of props and costumes. Their rooms opened on a courtyard with two bathing pools. The water in one was colorless and cold. The other bubbled, bright green. The entire acting company stripped and climbed in. What a pleasure! Though both pools were crowded. Well, thought Haik, she'd take a slow bath later, soaking the travel aches from her muscles and bones.

When they were done and in fresh clothes, a woman came for Dapple and Haik. "Ettin Taiin wants you to join his mother."

"Of course," said Dapple.

They went through shadowy halls, silent except for birds calling in the house's eaves. They sounded like water running over stones. The woman said, "Thirty days ago, Hattali fell. She seemed unharmed, except for damage to one foot. It drags a little now. But since the fall she's been preoccupied and unwilling to do much, except sit and talk with Taiin. We fear her great strength is coming to an end."

"It can't be!" said Dapple.

"You know about old age and death. We've seen them in your plays." Saying this, the woman opened a door.

Outside was a terrace, lit by the afternoon sun. Hattali sat in a high-backed chair, leaning against the back, her eyes closed. How old she looked! How thin and frail! Her warrior son sat next to her on a stool, holding one of his mother's hands. He looked at them, laid Hattali's hand gently in her lap and rose. "Cholkwa is in the north. I'm glad to see you, Dapple."

They sat down. Hattali opened her eyes, obviously seeing nothing. "Who has come, Tai?"

"Dapple and her lover, the potter."

The old lady smiled. "One last play."

"A play, yes," said Dapple. "But not the last, I hope."

A look of irritation crossed Hattali's face. "Did the potter bring pots?"

Haik excused herself and went to find her pack. Now she understood the house's quiet. Most likely, the children had been sent out to play; and the adults—she passed a few in the halls—moved softly and gravely. A matriarch like Hattali, a woman with so much dignity, should not be bothered with noise, while deciding whether to live or die.

When Haik returned to the terrace, Hattali seemed asleep. But the old woman took the pot Haik put in her hands, feeling it with bony fingers. "What is it?"

"There's a skull on top, a replica of one I found in stone."

"It's shaped like a *tli* skull," Hattali said.

"A bit, but the teeth are different. I imagine from the teeth that the animal had scales, not hair."

Hattali exhaled and felt more. "On the sides of the pot?"

"The animal as I imagine it must have been, when alive. I found the skull first and made a pot that Dapple bought. But now I have found the entire animal, and it wasn't the way I showed it on the first pot. So I made this."

"The animals are in relief?"

"Yes."

"What do they look like, if not *tli*?"

Haik thought. "An animal about as long as my arm, four legged with a tail. Spines protrude along the back, as if the animal had a fin there like a fish. That was the thing I did not imagine: the spines. And the tail is different also, flat from side to side, like the tail of a fish."

"What color is the glaze?"

"Black, except the skull, which is white."

"Tai," said the old woman.

"Mother?"

"Is it beautiful?"

"She is the Potter of Strange Animals. The pot is strange, but well made."

"I want it for my ashes."

"You will have it," he said.

She gave her son the pot. He turned it in his blunt, strong-looking hands. Hattali turned her blind face toward Haik. "You must still believe your crazy idea, that we are descended from bugs."

"That the world is old and full of change, yes," said Haik.

"Sit down and tell me about it again."

Haik obeyed. The old woman listened as she explained about beauty, death, and change.

"Well, we have certainly improved our lineage through careful breeding," said Hattali finally. "The child your kinsman fathered on Sai is a fine little girl. We hope she'll be as clever as you are, though I'm still not certain about your idea of time and change. Why didn't the Goddess simply make people? Why start with bugs?"

"She clearly likes bugs," said Haik. "The world is full of them. They are far more common than people and more varied. Maybe her plan was to create a multitude of bugs through beauty and death, and we are an accidental result of her breeding of bugs."

"Do you believe that?"

"No. She told me we have a gift no other living creature had: we know what we do. I believe this gift is not an accident. She wanted comprehension."

Haik was wrong in saying this, according to modern scientists. They believe life is entirely an accident, though evidently an accident that happens often, since life has appeared on many planets. Intelligent life is far less common, but has clearly appeared on at least two planets and may be present elsewhere in a form we do not recognize. It also is an accident, modern thinkers say. This is hard for many of us to believe; and Haik, living in the distant past, could hardly be expected to bring forward an idea so disturbing.

"Well, you certainly ought to listen to the Goddess, if she talks to you," said Hattali. "When will I hear your play, Dapple?"

"It will take a few days to prepare."

The matriarch tilted her head in acquiescence.

They left Hattali then, going back to their room. "I want you to make masks for a new play," Dapple said. "Five of your strange animals. They interest Hattali. Sit with her while you work, and tell her about your ideas. Taiin is an excellent man. None better! But her illness has got him frightened; and his fear is not helping her mood. Maybe she knows what she's doing. Maybe it is time for her to die. But I wonder if the fall has frightened her as well as her relatives. A woman like Hattali should not die from fear."

"Has she no daughters?"

"Two. Good women, but not half what she is, and she's never gotten along with either. The love of her life has always been Taiin."

He left the next morning, called to the western border. Gwa scouts had been seen. Their old enemies might have heard that Hattali was dying. What better time to attack?

"They expect that grief will break me," Taiin said, standing in the house's front court, dressed in metal and leather armor. A sword hung at his side, and a battle axe hung from a loop on his saddle. "It may, but not while there's work to be done." He swung himself onto his *tsin* easily, in spite of age and his bad leg. Once settled on the animal, he looked down at Haik and Dapple.

"She is the last of her generation. What people they were, especially the women! As solid as stone walls and towers! I have lived my entire life in their protection. Now, the walls are broken. Only one tower remains. What will I do, when Hattali is gone?"

"Defend Ettin," said Dapple.

He gathered the *tsin*'s reins, grinning. "You're right, of course. Maybe, if I'm lucky, we'll capture a Gwa spy."

A moment later he was through the house's gate, moving steadily along the dusty road, his men following, armed and armored.

"You may be wondering about his last remark," Dapple said.

Haik opened her mouth to say no.

"There are men who take pleasure in raping prisoners before they kill them. Or in harming them in other ways. I have suspected Taiin is one such. Now I'm certain."

This was how he'd deal with his grief at Hattali's illness: by making someone else's end unpleasant.

"Beauty and death," Dapple said. "This is the way the Goddess has organized her world, according to you and your bones."

They spent the next several days on Ettin Hattali's terrace. The weather remained dry and sunny. Haik worked on the masks, while Dapple sat with paper and brush, sometimes writing, more often listening.

There was a folding table next to Hattali's chair. The matriarch's relatives brought out food and drink. In any ordinary circumstance, it would have been rude to eat while conversing with other people, especially guests, but the old lady had not been eating. Good health always goes in front of good manners.

At first, Hattali ignored everything except water, brought in a glass goblet. This she held, turning the precious object between her bent fingers.

The first mask was the animal on Hattali's funeral pot: a long narrow head, the jaw hinged and moved with a string, the mouth full of pointed teeth. Snap! Snap!

The skin would be mottled green, Haik decided; the eyes large, round, and red. There were existing animals—small hunters with scaly hides—that had triangular pupils. She would give this creature the same. The spines on the back would be a banner, supported by a harness over Dapple's shoulders. Hah! It would flutter when her lover danced! As she worked, she described the mask to Hattali.

"Have you ever found large animals?" the old woman asked.

"Not complete. But large bones, yes, and teeth that are longer than my hands. The layer they are in is high on my native cliffs and was laid down

when the country was above water. They were land-dwellers, those animals, larger than anything living now, at least in the regions I've visited, and with teeth that remind me of birds' teeth, though more irregular and much larger."

"What eyesight you have!" Hattali exclaimed. "To see into the distant past! Do you really believe these creatures existed?"

"They did," said Haik firmly.

Gradually, as their conversation continued, the old lady began to eat: hard biscuits first, then pieces of fruit, then *halin* in a small, square, ceramic cup. Hattali was sitting upright now, her bony shoulders straight under an embroidered robe. Hah! She was licking her fingers! "Can you write, Haik?"

"Yes."

"I want you to write down your ideas and draw the animals you've found in stone. I'll have one of my female relatives make a copy."

"You believe me," said Haik in surprise.

"Most of what you've told me I knew already," Hattali answered. "How could any woman not know about inheritance, who has lived long enough to see traits appear and reappear in families of people, *sulin,* and *tsina?* But I lacked a framework on which to string my information. This is what you've given me. The frame! The loom! Think of the patterns the Ettin will be able to weave, now that we understand what the Goddess has been doing with sex and death and time!" The old woman shifted in her chair. There was a cup of *halin* next to her on the folding table. She felt for it, grasped it and drank, then reached for a piece of fruit. "I have been wondering whether it's time for me to die. Did you notice?"

"Yes," murmured Dapple.

"The blindness is hard to endure; but life remains interesting, and my kin tell me that they still need my judgment. I can hardly refuse their pleas. But when I fell, I thought—I know this illness. It strikes women down like a blow from a war club. When they rise, if they rise, who can say what the damage will be? Paralysis, stupor, the loss of speech or thought.

"This time the only damage was to one leg. But I may fall again. I have seen relatives, grave senior female cousins, turn into something less than animals—witless and grieving, though they do not remember the cause of their grief. Maybe, I thought, it would be better to stop eating now and die while I am still able to chose death.

"But I want your book first. Will you write it for me?"

Haik glanced at Dapple, who spoke the word "yes" in silence.

"Yes," said the potter.

The matriarch sighed and leaned back. "Good! What a marvel you are, Dapple! What a fine guest you have brought to Ettin!"

The next day, Haik began her book, drawing fossils from memory. Fortunately, her memory was excellent. Her masks went to the costume maker, who finished them with the help of the apprentices. It was good work, though not equal to Haik's. One apprentice showed real promise.

The old lady was eating with zest now. The house resumed the ordinary noise of a house full of relations. Children shouted in the courtyards. Adults joked and called. Looking up once from her work, Haik saw adolescents swimming in the river below the terrace: slim naked girls, their fur sleeked by water, clearly happy.

By the time the Ettin war party returned, Taiin looking contented as he dismounted in the front courtyard, the book on evolution was done. Taiin

greeted them and limped hurriedly to his mother's terrace. The old woman rose, looking far stronger than she had twenty days before.

The war captain glanced at Dapple. "Your doing?"

"Haik's."

"Ettin will buy every pot you make!" the captain said in a fierce whisper, then went to embrace his mother.

Later, he looked at Haik's book. "This renewed Hattali's interest in life? Pictures of shells and bones?"

"Ideas," said Dapple.

"Well," said Taiin, "I've never been one for thinking. Ideas belong to women, unless they're strategic or tactical. All I can be is thankful and surprised." He turned the folded pages. "Mother says we will be able to breed more carefully, thinking of distant consequences rather than immediate advantage. All this from bones!"

The actors did their play soon after this, setting their stage in the house's largest courtyard. It began with a fish that was curious about the land and crawled out of the ocean. In spite of discomfort, the fish stayed, changing into an animal with four legs and feet. Hah! The way it danced, once it had feet to dance with!

The fish's descendants, all four-footed animals, were not satisfied with their condition. They fell to arguing about what to do next. Some decided that their ancestral mother had made a mistake and returned to water, becoming animals like *peshadi* and *luatin*. Others changed into birds, through a process that was not described; Haik knew too little about the evolution of birds. Other animals chose fur, with or without a mixture of scales.

One animal chose judgment as well as fur.

"How ridiculous!" cried her comrades. "What use are ideas or the ability to discriminate? You can't eat a discrimination. Ideas won't keep you warm at night. Folly!" They danced away, singing praise for their fur, their teeth, their claws.

The person with fur and intelligence stood alone on the stage. "One day I will be like you," Dapple said to the audience. "No spines on my back, no long claws, no feathers, though I had these things, some of them at least, in the past. What have I gained from my choice, which my relatives have just mocked? The ability to think forward and back. I can learn about the past. Using this knowledge, I can look into the future and see the consequences of my present actions. Is this a useful gift? Decide for yourselves."

This was the play's end. The audience was silent, except for Hattali, who cried, "Excellent! Excellent!" Taking their cue from the old lady, the rest of the Ettin began to stamp and shout.

A day later, the actors were on the road. They left behind Haik's book and the new masks. Dapple said, "My play doesn't work yet, and maybe it never will. Art is about the known, rather than the unknown. How can people see themselves in unfamiliar animals?"

Haik said, "My ideas are in my head. I don't need a copy of the book."

"I will accept your gifts," said Hattali. "And send one copy of the book to another Ettin house. If anything ever happens here, we'll still have your ideas. And I will not stop eating, till I'm sure that a few of my relatives comprehend the book."

"It may take time," said Haik.

"This is more interesting than dying," Hattali said.

The story ends here. Haik went home to Tulwar and made more pots. In

spite of Taiin's promise, the Ettin did not buy all her work. Instead, merchants carried it up and down the coast. Potters in other towns began to imitate her; though they, having never studied fossils, did not get the animals right. Still, it became a known style of pottery. Nowadays, in museums, it's possible to find examples of the Southern Fantastic Animal Tradition. There may even be a few of Haik's pots in museum cabinets, though no one has yet noticed their accuracy. Hardly surprising! Students of art are not usually students of paleontology.

As for Dapple, she continued to write and perform, doing animal plays in the south and heroic tragedies in the north. Her work is still famous, though only fragments remain.

The two lovers met once or twice a year, never in Tulwar. Dapple kept her original dislike of the place. Often, Haik traveled with the actor's company, taking pots if they were going to Ettin.

Finally, at age fifty, Haik said to her senior relatives, "I am leaving Tulwar."

The relatives protested.

"I have given you three children and trained five apprentices. Let them make pots for you! Enough is enough."

What could the relatives say? Plenty, as it turned out, but to no avail. Haik moved to a harbor town midway between Tulwar and Hu. The climate was mild and sunny; the low surrounding hills had interesting fossils embedded in a lovely, fine-grained, cream-yellow stone. Haik set up a new pottery. Dapple, tired of her rainy home island, joined the potter. Their house was small, with only one courtyard. A crown-of-fire tree grew there, full-sized and rooted in the ground. Every spring, it filled their rooms with a sweet aroma, then filled the courtyard with a carpet of fallen blossoms. "Beauty and death," Dapple sang as she swept the flowers up.

Imagine the two women growing old together, Dapple writing the plays that have been mostly lost, Haik making pots and collecting fossils. The creatures in those hills! If anything, they were stranger than the animals in the cliffs of Tulwar!

As far as is known, Haik never wrote her ideas down a second time. If she did, the book was lost, along with her fossils, in the centuries between her life and the rediscovery of evolution. Should she have tried harder? Would history have been changed, if she had been able to convince people other than Ettin Hattali? Let others argue this question. The purpose of this story is to be a story.

The Ettin became famous for the extreme care with which they arranged breeding contracts and for their success in all kinds of far-into-the-future planning. All through the south people said, "This is a lineage that understands cause and effect!" In modern times, they have become one of the most powerful families on the planet. Is this because of Haik's ideas? Who can say? Though they are old-fashioned in many ways, they've had little trouble dealing with new ideas. "Times change," the Ettin say. "Ideas change. We are not the same as our ancestors, nor should we be. The Goddess shows no fondness for staying put, nor for getting stuck like a cart in spring rain.

"Those willing to learn from her are likely to go forward. If they don't, at least they have shown the Great Mother respect; and she—in return—has given them a universe full of things that interest and amaze." O

HOT BLOOD

Brian Stableford

***The Omega Expedition*, the final volume of Brian Stableford's "future history" series—which includes *Architects of Emortality* (1999), *The Fountains of Youth* (2000), and *Dark Ararat* (March 2002)—will be published by Tor in December 2002. It will be followed in March 2003 by *Kiss the Goat: A Twenty-First Century Ghost Story* (Prime Press). The author is still hoping that *The Vampire of Paris*, a translation of *La Vampire* by Paul Feval, will be published in 2003 by Sarob Press, which previously issued his translations of two Feval novellas. Recent publications in this vein are a new version of *Lumen* by Camille Flammarion (Wesleyan University Press) and a collection of stories by Jean Lorrain, *Nightmares of an Ether-Drinker* (Tartarus Press). In his latest story, Mr. Stableford takes a look at some of the economics of vampirism.**

When I first went into the blood business I had no idea that vampirism would ever become fashionable, or that it would provide me with the opportunity to fulfil my mother's dying wish by saving my brother Frankie from a life of crime. When I built my first bloodshed in one of the less picturesque parts of the Pennines and stocked it with four hundred genetically modified swine the business was a simple matter of producing designer blood for xenotransfusion. Biotech companies were busy engineering animals whose blood was far better for patients in need than anything that could be leeched from human donors, because it was augmented with various kinds of healing aids as well as being guaranteed free of inconvenient viruses and prions.

It might have been a profitable business even then, if I hadn't been squeezed from every side. Every time I got my head above water the relevant taxes would rise, or the interest on my loans would be hiked, or the stocks I'd removed to the breeding pens would become obsolete, or some franchise consultant with a bee in his bonnet about economies of scale

would convince me that I'd never get ahead if I didn't expand. Even so, I'd probably have stayed completely honest if it hadn't been for Frankie's evil influence.

Frankie had always been the hot-headed and hot-blooded one: the compulsive taker of short cuts, the fanciful wheeler-dealer. He had started his criminal career when neither he nor the century had yet attained their twenties, working for a cigarette-smuggler in Huddersfield. Frankie's luck being what it was, the bottom fell out of that racket mere months after he had decided to go independent—but Frankie's luck being what it was, he was just in time to catch the leading edge of the great plantigen panic of'29. For the next five years he hawked genetically enhanced potatoes and carrots out of the back of his van from Manchester to Doncaster, cutting a tidy profit even on the rare occasions when the veg was carrying the subtle merchandise he claimed. His so-called fleet grew from one van to twenty—eleven of them refrigerated—before fate and a couple of dissatisfied customers caught up with him, at which point his newly acquired wealth melted like snow in July into the black hole of his medical expenses.

The doctors fixed him up all right—better than new in many ways—but that only made it harder for Frankie to learn the lesson that experience had been trying to teach him. While they were picking the bullets out of his back they had to pump no less than forty-one liters of designer blood through his system, and while he was laid up for a further six weeks re-generating his pulverized kidneys they had to give him another fifty-six liters to provide "resident stem-cell stimulation, nascent tissue reinforcement and analgesic support" plus twelve more to compensate for "dialysis wastage." At any rate, that's what the bill said—and who among us nowadays has the guts to challenge a flesh mechanic's accounts?

I suppose, looking back, it's no wonder that Frankie came out of hospital with a very healthy regard for the value of genemod pig's blood. Given that he was Frankie, it was also no wonder that he came out with a brand new girl friend: a senior staff nurse with contacts—not the kind that you put in your eyes—and the bulkiest breast-enhancements I ever saw. Human mammary glands aren't very useful as bioreactors—on that particular playing-field the cows will always win hands down—but there's a certain kind of woman who reckons that the fringe-benefits more than make up for the low rent, and Janis was definitely that sort of woman. Frankie, alas, was always that sort of woman's man, and to make matters worse he was going through a phase when he felt that his image couldn't be complete unless it included a "moll."

Frankie and Janis came to stay with me for a week following his release from medical captivity. He told me on the phone that he needed a few days' rest and recuperation in the "deep countryside" but I knew there had to be more to it than that. I even suspected that there'd be trouble, but I could hardly turn him down, could I? He was my brother, and he never ceased to remind me, with a suitably satirical cackle, that blood is thicker than water.

I was mildly surprised that he asked me to show him the bloodsheds—I had three by that time—and very surprised that he got through the tour without throwing up, but he never had time to feel queasy when his mind was on money.

"You know, Jeff," he said to me, as he crunched the crackling he'd carefully moved to the side of his plate while he ate his dinner, "this place could be a little gold-mine if you could only bring yourself to stretch the regs a bit."

"No it couldn't," I told him. "The Ministry comes down like a ton of bricks on anyone who sets up unlicensed stock. If you're thinking of importing black-market pigs from China, forget it. Most of them are dodgier than those King Edwards you used to shift by the sackload, and even the ones with genuine supplements have genetic fingerprints that stick out like a sore thumb when Mr. Maff pays a routine call. I'm thirty-two expecting to live to a hundred-and-twenty, and I aim to keep my license clean for at least another fifty years."

"You mistake my meaning, little bro," he said, putting on a pseudo-parental manner even though he was only eighteen months the elder and hadn't ever taken care of me even after mum's death. "Replacing your stock with illegal immigrants would be a bad move, I quite agree—but there's more than one way to skin a piggie. I never realized until I had to grow a new pair of kidneys how good a little fresh blood can make you feel. It was a real tonic, I can tell you—but I couldn't help feeling, toward the end, that the medics were being just a little bit *mean*."

"Not according to the bill they stuck you with," I pointed out.

"Not *quantitatively* mean," he said, having obviously been practicing his pronunciation. "*Qualitatively* mean. There was a possibility of addiction, they said, so they had to thin out the analgesics. Those little red cells were stuffed full of all kinds of nutrients, antibiotics and collagen-precursors, but when it came to the feelgood factor, they felt just a little bit anemic, if you follow my drift."

I followed his drift all right. The genetic fingerprints recorded by the Ministry's field-testing devices are a little bit blurred: they're reliable as far as detecting which genes are present, but they're not much good at estimating the level of their activity. What Frankie had in mind—thanks, no doubt, to a crash course in elementary genetics administered by Janis the senior staff nurse—wasn't anywhere near as crude as smuggling patent-busting pigs. What he had in mind was tweaking the expressivity of the genes with which my fully licensed Ministry-approved pigs were already fitted so as to alter the product-balance. He was suggesting that I should increase the concentration of the morphine-analogs in the blood my pigs were producing.

"Don't you think the hospitals would notice if their patients were boosted into orbit?" I asked, although I already knew what he was going to say next.

"Don't be daft, Jeff," he retorted. "What would be the point of selling it on to hospitals at list price? Fact is, not all the blood that's sold to hospitals ends up in the patients—not *current* patients, at any rate. Some of it gets sold on via the back door, mostly to people who've got a taste for it, but also to people who've heard how good it is and would like to acquire a taste for it. It's a growing market, kiddo. It won't be as big as the plantigen bubble, but it won't turn turtle the way that one did. The situation is crying out for someone to cut out the middleman and take the product direct from the farm to the consumer."

"And Janis knows how you can do that, I suppose?" I said.

"Bang on," he informed me. "And guess who happens to have seven refrigerator-trucks sat in the garage doing bugger all?"

"Haven't they been repossessed?"

"The other four were," he admitted. "The ones I still have were acquired through unorthodox channels. As their existence was always semi-official, at best, they sort of slipped through a hole in the receiver's net."

Frankie went on to explain, in great detail, exactly how he and Janis

could fix it up for an engineer to call around and collect a few dozen embryos from my breeding sows. He'd remove them to some university lab—the only way the government can hold down higher education expenditure is to turn a blind eye to the details of their entrepreneurial adventures—and tweak the genes controlling the expressivity of the genes on the artificial chromosomes. He wouldn't switch anything off, because the therapeutic value of the cocktail accounted for at least a part of the demand, but he'd pump up the volume of the products that had "recreational value." Then he'd send them back to be reared; with luck, enough of them would beat the attrition rate to establish a breeding population.

If I could step up the production of my industry standard pigs even slightly, the gradual drop in production distributed through existing channels as I moved the new stock into the bloodsheds wouldn't look suspicious. The produce of the re-enhanced animals would be loaded into Frankie's trucks and spirited away to a destination I didn't need to know anything about, and my cut would be payable on a weekly basis, in hard cash. The Treasury had been trying to develop a cashless economy for the best part of half a century, but the people wouldn't tolerate it. The man in the street loves his fiddles, and without cash, fiddling would become a hackers' monopoly—and the only thing the man in the street hates more than the Inland Revenue is the hacker who can pick his pocket from the other side of the world.

I took some persuading, but in the end I went for it. Maybe I was weak, but I was getting sick of always having to run faster just to stay in the same place. I was also getting just a little bit tired of always being the sensible one. To cap it all, and despite the occasional hallucinatory image of mum spinning in her grave, it really did seem like a good idea—a better one than I had ever expected from Frankie the cockeyed optimist.

Everything went well for the first couple of years. In fact, it went extremely well. The tweaker was an ace, and I reared two boars and a sow from the first batch of re-enhanced embryos. They were not only fit but fertile, and my breeding population increased rapidly. Frankie had been absolutely right about the growth-potential of the market, and I'd been in the business long enough to have learned a wrinkle or two about stretching production, so my regular production didn't suffer at all. The extra work was hard, of course, but I was used to working sixteen-hour days, and it was a temporary problem. As my cash-flow improved I was able to hire another full-timer and two more part-timers, reducing my own hours by a third.

During '35 and '36 I expanded my "special herd" from two dozen to two hundred, and then to three hundred. I had to add an extra bloodshed to my premises and take in more standardized stock, but the rate of innovation had slowed somewhat and there was no need for a large-scale replacement program. I not only passed all four of the half-yearly Ministry inspections but survived a surprise visit from the Animal Welfare Squad. The random geneprintings sampled a couple of dozen re-enhanced animals along with a hundred and fifty others, but all the smudges were well within the tolerance-limits of Mr. Maff's portable equipment.

In the meantime, ever-increasing quantities of cash rolled in. By Christmas '36 I was able to get a couple of cosmetic enhancements of my own, and a whole new wardrobe of clothes that were smart in both senses of the word. I was beginning to get out a lot more too—so much, in fact, that in the spring of '37 I ended up with a girlfriend. Melanie was an engineer in the

food industry, who had recently graduated from routine work on cereal-based whole-diet manna-powders to exploratory research in the relatively underdeveloped field of "texture management." Melanie was much nicer than Janis, because she'd never gone in for any kind of personal enhancement and wasn't the sort of woman who'd hire herself out as a bioreactor in any case.

Alas, when things first began to get sticky, Janis turned out to be not very nice at all. With her nurse's salary, her milk income and her cut of the blood-running business she was clearing a tidy sum, but she was one of those people whose appetites increase as they're fed, and who can't tolerate the slightest setback. When our sales leveled off, and then began to slide, she put pressure on Frankie, demanding that he put pressure on me to increase production further and faster.

Actually, it wasn't really a production problem. Obsolescence doesn't affect illicit trade as much as legitimate business, but progress always marches on. When her contacts explained to her that better products were coming on stream she started banging on about starting over with a new set of retweaked embryos. I was reluctant to do that, partly because it would be expensive and troublesome, but also because I felt that I'd already got what I needed out of the illicit operation. It seemed to me that the hot blood had got me over the hump in my career, and that I could now make a go of the business without its support. I was quite happy to let the sideline cool off gradually and wither away—but I could tell that Frankie wasn't yet ready to go legit, and never would be while Janis's bosom was a millstone round his neck. So I procrastinated, figuring that time and increasing competition might settle the question.

For once, it was me who was being the cockeyed optimist.

All the while she was applying pressure to us, apparently, Janis was also putting pressure on the people she was supplying to hike their retail prices, in order to facilitate a similar increase in the wholesale price. They couldn't do it. The market was still expanding, but it was also diversifying, in more ways than one. It wasn't just a matter of competing products but of competing organizations. Many of them were small independent operators just like us, but as the size of the market grew it attracted other kinds of people. When the old pros began to muscle in on the racket and the principle of natural selection came into force the business evolved into something quite different and much more dangerous.

I had to explain to Frankie—although he, of all people, should have understood the logic of the situation—that we were getting out of our depth. If we were to keep going at all, I told him, the only sensible course was to keep our own operation small and unobtrusive, and to accept the creeping obsolescence of our product as a blessing that would help to persuade the new operators that we could not offer them any serious competition. Maybe Frankie tried to explain all this to Janis, but if so, the message got lost somewhere along the chain of transmission.

"You're out of touch, Jeff, stuck way out here on the moors," she explained to me, when Frankie brought her out to the farm to celebrate the second anniversary of our first big pay day. "The queues for elective surgery are growing longer every day, partly because new techniques in cosmetic somatic engineering keep rolling off the production line but mainly because you can't take the face and body God gave you into any interview anywhere in the city and walk out with a job. There isn't anyone in the country under forty

who hasn't spent a vacation on the wards in the last couple of years—and that's not counting the sick, the injured and the reproductively challenged. Just because the panic's over doesn't mean that the Eight Plagues have shot their bolt, and '36 was the biggest year ever for Extreme Sports. Everybody and his cousin has tasted xenotransfusion blood by now, and even the ones who get it while they're comatose come out the other end feeling that something is missing from their lives. This market is going to be *huge,* and we're in on the ground floor. All we have to do is *keep up.* Hell, in ten years time it'll probably be *legal.* It's the opportunity of a lifetime, Jeff, and we have to seize the day. We have to update our stock, and we have to step up production."

"Even if I did update the stock I couldn't build another shed," I told her, exercising my first line of defense. "I just don't have the land."

Her answer to that, of course, was to buy more—but our profits weren't *that* big, and ours wasn't the kind of business plan you can take to a bank.

"I can get you the money," she said. "I have contacts."

"So what you want me to do, Janis," I said, sarcastically, "is to borrow money from one lot of gangsters so that Frankie and I can go head to head with another lot of gangsters in a bloody turf war?"

The sarcasm was wasted, because that was exactly what she wanted to do.

So far, I'd managed to rig things so that my staff didn't know what I was up to, although they must have figured out that I had to be into *something* dodgy. Even those I'd only been able to take on with the aid of under-the-table cash were neighbors I'd known since I first moved to the area, who reckoned my operation was a thoroughly good thing for the local economy. I'd always treated them well, by their admittedly meager standards, and they had a tradition of not blabbing to "the authorities" that went back to the nineteenth century and beyond. If I bought more land and built more sheds, though, I'd be seen as a man of disruptive ambition rather than one who had accommodated himself to the existing scheme of things. If I hired any more new staff I'd have to bring them in from further afield. Keeping the lid on the bigger operation would be a much trickier affair. A further issue, of steadily increasing importance, was Melanie. She didn't know, as yet, that I was doing anything I shouldn't have been, but our relationship had matured to the point where I didn't want to keep secrets from her—and she was certainly smart enough to know that I couldn't expand on the basis of my honest business. So there were all kinds of powerful reasons why I had to say no to Janis, and that's what I did.

Unfortunately, Janis wasn't the sort of girl to take no for an answer.

Three weeks later I had a visit from two extremely well-dressed gentlemen who were extremely keen to lend me a lot of money, and very eloquent in explaining the reasons why I ought to take it.

I said no to them, too, as politely as I could.

I knew that Janis had exposed us to exactly the kind of attention I was desperate to avoid, but I clung to the hope that the smart men wouldn't consider it worth their while to persist. Unfortunately, and however paradoxical it may be, it's often the most unprincipled people who cling hardest to those points of principle they do uphold. Three days later, one of Frankie's vans was hijacked ten minutes after leaving the farm. The driver wasn't too badly roughed up, but the van and its cargo disappeared into thin air.

I summoned Frankie to a family conference and told him flatly that I wasn't prepared to go to war to defend the illicit side of my business, be-

cause losing—or even a hard-fought draw—would undoubtedly cost me everything. I also reminded him about mum and the probability of her resting uneasily in her coffin. He told me that he was disappointed to hear me using such underhanded tactics, but that he understood where I was coming from. He promised to have a stern word with Janis and set her straight.

Three days later a second van was hijacked. This time, Frankie—following a plan whose details he hadn't thought to confide to me—was "riding shotgun." The driver and one of the hijackers ended up shot in the head, with their brains completely mashed, but even though two of the five remaining hijackers suffered painful injuries they were sufficiently businesslike to make sure that Frankie only ended up in hospital, facing stupendous medical bills and a *real* blood habit.

I spent that night slaughtering pigs. It took me until three in the morning to kill all the ones I needed to kill, and it required all of Frankie's remaining refrigerator trucks to ferry the carcasses to a semi-legal chop shop. Whether any of the crackling found its way to the side of one of Frankie's plates, hoarded for a climactic treat, I don't know.

I had to close down one of my sheds, but at least I'd made my position clear. Janis's friends decided that they, too, had made their point.

By the time the doctors brought him out of the induced coma, Frankie was flat broke again, but his lights were all switched on and his heart was back in the right place. Another week passed while he was suspended in a tank, conscious but not able to do much except watch subsurface TV, but once they hauled him out of the gel and into a bed he was allowed visitors. The first words out of his mouth were the ones that told Janis she was history. She didn't like it, especially because he did it in front of Melanie and me, but we figured that her threat-cum-promise that he'd live to regret it was so much hot air.

"It's time to give up the life of crime, Frankie," I told him. "I know you're over forty now, but we're living in the twenty-first century. It's not too late to start over. It's what mum would want."

"I can't," he said, miserably. "You have no idea what it's like. I'm hooked, Jeff. Those bastards knew exactly what they were doing. It's not so much a matter of suffering the withdrawal symptoms—the doctors will pull me through that, at a price. It's all in the mind. Once you've tasted *real* blood, you can never be content with the stuff in your veins. You're way too straight to understand, but I'm committed to the dark side, as a customer if not as a supplier. If I can't work for myself, I'll have to work for *them*."

He meant that he had to earn his fix, and that if he couldn't do it as an entrepreneur he'd have to do it as a foot soldier. Even as a small-time entrepreneur his life-expectancy had looked shaky; as a mere foot soldier he'd be lucky to survive ten years.

"You can come and work for me," I said. "Or rather, for Melanie and me. The newest generation of enhanced swine produce shaggy coats at a phenomenal rate as well as superabundant blood, and she's setting up a factory in my empty bloodshed to process the shearings."

"Process them into what?" he wanted to know. "Silk purses?"

"That's ears, not fleeces," I told him. "No, what we're aiming to do is to produce the ultimate in dietary roughage."

He looked at me as if I were mad. "What?"

"Dietary roughage." I didn't normally trouble Frankie with technical de-

tails, but for once I let my enthusiasm carry me away. "You see, the trouble with whole-diet products is that although they provide all the nutritional requirements of the human body, they don't entirely agree with the human digestive system. Whether you take them in liquid form or bulk them out artificially as porridge they don't have the kind of textural spectrum that your gut feels comfortable with. What the world needs right now is effectively designed roughage, which has no nutritional value whatsoever—except for the flavorings and maybe a few trace-elements that are inconvenient in solution—but which fills the comfort-gap and the oral reward-gap that mannas leave unsatisfied. You might think that's easy, but it isn't. To get the necessary textural flexibility you need a very carefully balanced blend of cellulose-analogs and keratin-derivatives. The engineers have been trying for decades to persuade plants to do the work, but there are problems with lignin-spinoff as well as orchestrating a keratin-deposition system. It turns out that it's far more convenient to translocate the cellulose-analog gene-set into pigskin. Melanie's right at the forefront of the field, and with my talent for coaxing extra production out of the stock we reckon we can steal a march on the opposition. The new products don't require refrigerator-trucks for transportation, and they're absolutely one hundred percent legal."

"And what would I do?" he asked, plaintively. "I don't know the first thing about food tech."

"Yours would be a management position," I assured him.

"One that would pay enough to supply my need for you know what?" he said, miserably.

"Absolutely," I said. I thought—rightly—that there'd be plenty of time later to explain, in more private surroundings, that although I'd slaughtered the right number of pigs, in case anyone was taking a precise count, not all of them had been re-enhanced. I still had a small breeding population of happy-chemical supermanufacturers. I wasn't selling their produce, and I had no intention of doing so in the foreseeable future, but I certainly had more than enough to supply a few family members and close friends, should the need arise. Being the cool-headed one, if not the cold-blooded one, I always like to keep my options open, especially when I'm under excessive pressure to close them down.

Ironically, it turned out that Frankie's need for illegal substances wasn't quite as desperate as he had anticipated while he still lay inactive in his extremely expensive bed. Once he had thrown himself into his new job—which was a perfectly real job, with opportunities for career-progression as well as a healthy supply of responsibilities—he found that his dependency decreased by slow but inexorable degrees. By the time another year had passed, he was as fit as a flea, and by no means as obsessed with blood. Instead, he had become obsessed with every aspect of dietary roughage: its production, its design, and its marketing.

"It's criminal that this stuff should be legal," he said to me, when we had a little party to celebrate the second anniversary of our new joint venture. "I mean, it sounds stodgy but in fact it's pure fun. People love the stuff. They can eat it to their heart's content, savoring every texture, every flavor, and suffer not a single side-effect. It does *nothing*."

"Not exactly—and not for long," Melanie told him, a trifle severely. "It makes much more sense to accommodate some of the nutritional responsibilities that have previously been consigned to soluble manna-powders into a robust structured matrix. But that'll only be the start. It also makes sense

to transfer some of the medical responsibilities that are currently provided by xenotransfusive blood. Bit by bit, products that are currently expressed in the blood-manufacturing cells of Jeff's pigs will be expressed in the follicular roots as well—or even instead."

"That's an engineer's point of view," the new Frankie told her, "but doing what's possible—even what might seem perfectly rational, to a super-straight person like you—isn't necessarily the right way to go. I think it would be a crying shame to start loading our stuff with useful functions, when what we could do is keep working on the fun aspects. It isn't as if the world's short of useful things. Hell, there are so many useful things around that we've forgotten what a wonder it is to have things around us that have no earthly use whatsoever. Trust me on this one, Mel—let's not confuse the issue by trying to make roughage into another kind of manna. Leave the demand-management to me, and I'll make us all three times as rich as we would be if we played it your way."

"What do you think, Jeff?" my wife-to-be asked me, loyally.

"Let's just take it one step at a time," I said, in my careful fashion. "Who knows what trends the new year will throw up?"

To tell the truth, I was still a bit worried about Frankie reverting to type, and I didn't like to hear him using phrases like "three times as rich." It turned out, though, that I had never spoken a wiser sentence in my entire life.

The new roughage was a big hit, not because anybody really needed it, but because it *felt right*.

The revolution in human eating habits that had alienated us from our innate digestive technology had happened long before modern times. It dated back at least to the invention of agriculture, and probably to the invention of cooking. We'd made astonishing progress in the interim, in terms of gastronomy as well as nutritional science, but there had always been a little something lacking: a small loophole in our satisfaction. It wasn't until the ingenuity of biotech engineers was brought to bear on the roughage problem that most people realized the problem existed—but once they discovered that it not only existed but had been solved, they took to the stuff like ducks to water.

Our early involvement in roughage production would have made us mod-

estly well off even in the absence of other trends, and there was a period when Frankie urged me to get out of the blood business altogether so that we could concentrate all our resources on our most profitable hairlines. I wouldn't do that, partly because of my habitual cautiousness and partly because I figured that while our animals had no option but to have blood flooding their veins as well as hair fountaining out of their skins, we might as well make the most of both.

It was perhaps as well that I stuck to my guns, because it turned out that Janis had been right. By the mid-forties the illicit blood business had grown to such awesome proportions that it made no political sense to maintain its illegality. Not only were the laws in question criminalizing an absurdly high percentage of the population, but organized crime was getting out of hand *again*.

This time, even parliament and the police understood that the sensible response to that kind of situation was to call off the dogs. Consumer blood became legal in June '48, and the whole economic spectrum in which we operated was transformed, so to speak, at a stroke. Vampirism was all the rage by Halloween; no cocktail party was complete without a dozen bottles of the best, and the dossers in the city streets were buying it by the bucket.

Suddenly, the demand for re-enhanced pigs far outstripped the supply. Anyone with a potential breeding population, no matter how it had been acquired, might as well have been in possession of a goose that could lay golden eggs. Under the protection of a temporary amnesty, I came clean about my secret sties and gave the little darlings the go-ahead to breed like rabbits.

Vampirism couldn't have become so popular, of course, if it hadn't been for the new roughage. Manna could supply the nutritional requirements of a vampire, but a digestive system that was already out of sorts because it wasn't entirely comfortable with manna would have thrown a real wobbly under the further burden of orally consumed blood. Thanks to the new roughage, though, the human gut could be perfectly at ease with itself while the palate enjoyed the plethora of delights produced by all the new kinds of blood that erupted on to the market.

Some hardened users, of course, remained adamant that the only proper way to take blood was straight into a vein, but the march of progress went on regardless. There was an aesthetic component to blood-drinking, which went far beyond the taste sensations that could be as easily satisfied by manna and roughage. Vampirism was a style thing: a matter of image. You might think that a practice that permeated every stratum of society wouldn't be much use as an image-maker, but it isn't so. Thanks to the ceaseless endeavors of twentieth-century film-makers there were vampire icons available to suit every pocket and every idiosyncrasy. If there were a thousand kinds of blood, there were nearly as many accompanying rituals of consumption.

I knew that it couldn't last, of course, but I was fully prepared to ride the fad while the product was hot. There had never been a better time to be in the blood business, and I was determined to make the most of it. Mr. Maff the Regulator was still a blight upon the land, of course, because even civil servants can spot a golden opportunity, but a number of backhanders changed pockets and twice as many scrupulous eyes were turned in other directions, and for eighteen glorious months we were on top of the world. There wasn't a gangster in sight, because the gangsters were doing what

gangsters always do in that kind of situation, and trying their level best to go legit.

Melanie and I got married in February '50, and Frankie was thoroughly convincing in the role of best man. By this time he was embarked upon a new and atypically healthy relationship of his own with Melanie's cousin and fellow food technologist, Suzanne. The honeymoon was a sheer delight, and fate smiled on us long enough to let all but a day of it elapse before we were urgently called home.

We were informed by the policeman who summoned us that Frankie had been waylaid while exiting Suzanne's apartment by a vengeful and crazy Janis, who was drugged up to the eyeballs on seriously dodgy blood derived from pigs illegally imported from China. She had shot him four times.

Fortunately, although Janis had aimed at Frankie's heart, the weight of her unwieldy weapon had dragged the trajectories of the bullets downward, and all four had ended up in his abdomen. The doctors told me that when he had been stretchered in he had told them not to bother to patch up the holes this time, so that the next lot could just pass right on through.

The bills were horrendous, but we could afford them—and we had plenty of change to spare. When Frankie came out of the tank he was still in a passably good mood.

"You see, Jeff," he said to me, as if he were proving a point, "it wasn't my criminal tendencies that kept getting me into trouble after all. It's just that I'm the kind of guy who gets shot up occasionally, whether he's going straight or not."

Suzanne wasn't impressed by this display of bravado. "Frank," she said, with the air of a person who meant exactly what she said, "I forbid you to do this again—*ever*."

"Okay, Suze," he said, with surprising docility. "You're the boss."

"No," I reminded him, gently. "*I'm* the boss. But if you can possibly help it, I'd rather this was the last time. There are only so many times you can re-grow a kidney and still produce workmanlike piss."

"No problem," he said. "If the worst comes to the worst I'll hire myself out as a bioreactor in order to get them re-enhanced."

"No you won't," said Suzanne. I realized then that Mum would have been proud of Suzanne, and proud of me for making Suzanne possible. The government had helped, of course, but the ultimate credit for Frankie's reformation came down to me.

Frankie, sensing that Suzanne had the measure of him, and that it was more accurate than he'd ever have liked to admit, switched to safer ground. "How's business?" he asked.

"Pretty good," I assured him, gladly. "The vampire fad has begun to fade out, but the medical side of the blood business is steady enough. Melanie and Suzanne have some really hot ideas for a new set of hairlines and the techs at the supply company have decided that there might be something useful to be made out of those cute little curly tails pigs have, so there's no danger of things becoming boring. There'll be plenty to occupy your mind when you're fit again, and plenty to do to get your muscles back in shape. You'd better recover quickly, though—we can't get by without you for much longer."

"Thanks, bro," he said, with enough genuine feeling to warm the cockles of a younger brother's heart and allow a dutiful mother to rest easy in her eternal sleep. "It's good to know that some things never change." ❍

PAWS

Our old tomcat
caught another fairy last night.
Brought it in through the cat door,
then played with, and devoured
it beneath the kitchen table.

I found the remains
this morning, two white,
spider-silk wings still aglow with a
bit of residual magic, and quickly
surmised that they weren't

those of some bird.
Of course there was no blood
nor twig-like bones, or the vague
recollection of a sparrow
crying in my dreams.

I guess the reality of
grass snakes, field mice,
crickets, hummingbirds, butterflies,
and dragonflies is no longer
good enough for this

gluttonous old tom,
now that he's discovered the
entrance to Fairyland out back
in the English Ivy. It's likely he'll raid
it every night which

shows a certain refinement
in his tastes, but insures one and
all the wrath of the Fairy Queen, more
snooping around by the landlord,
and bad luck ad infinitum.

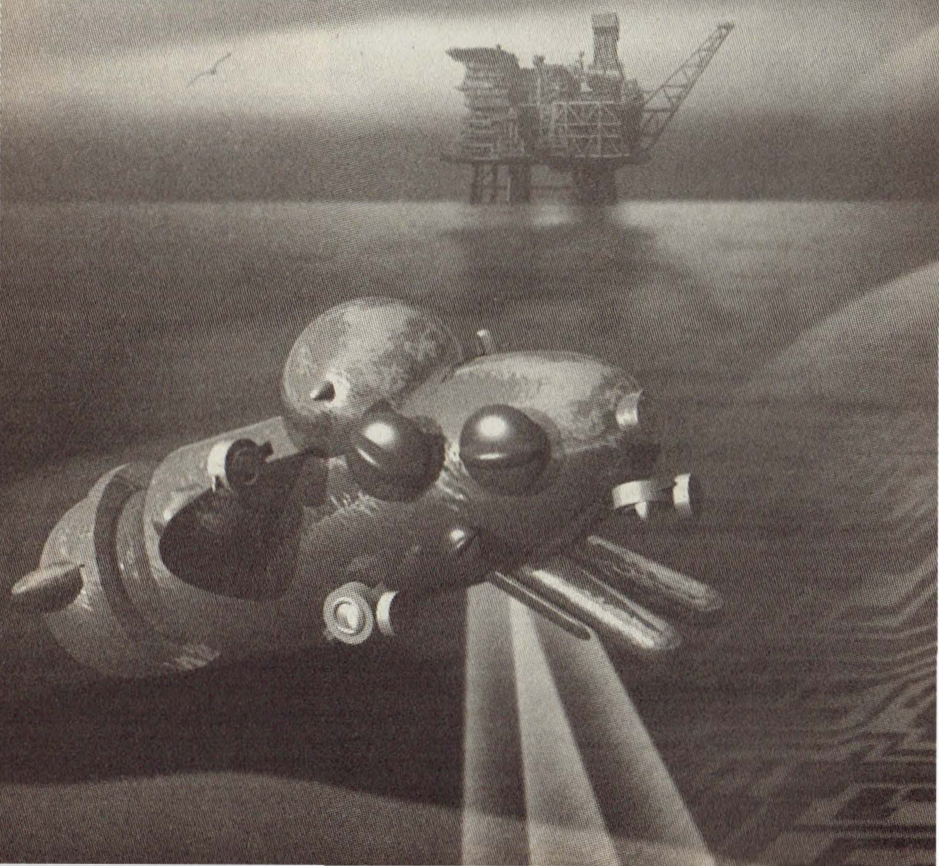
—G.O. Clark

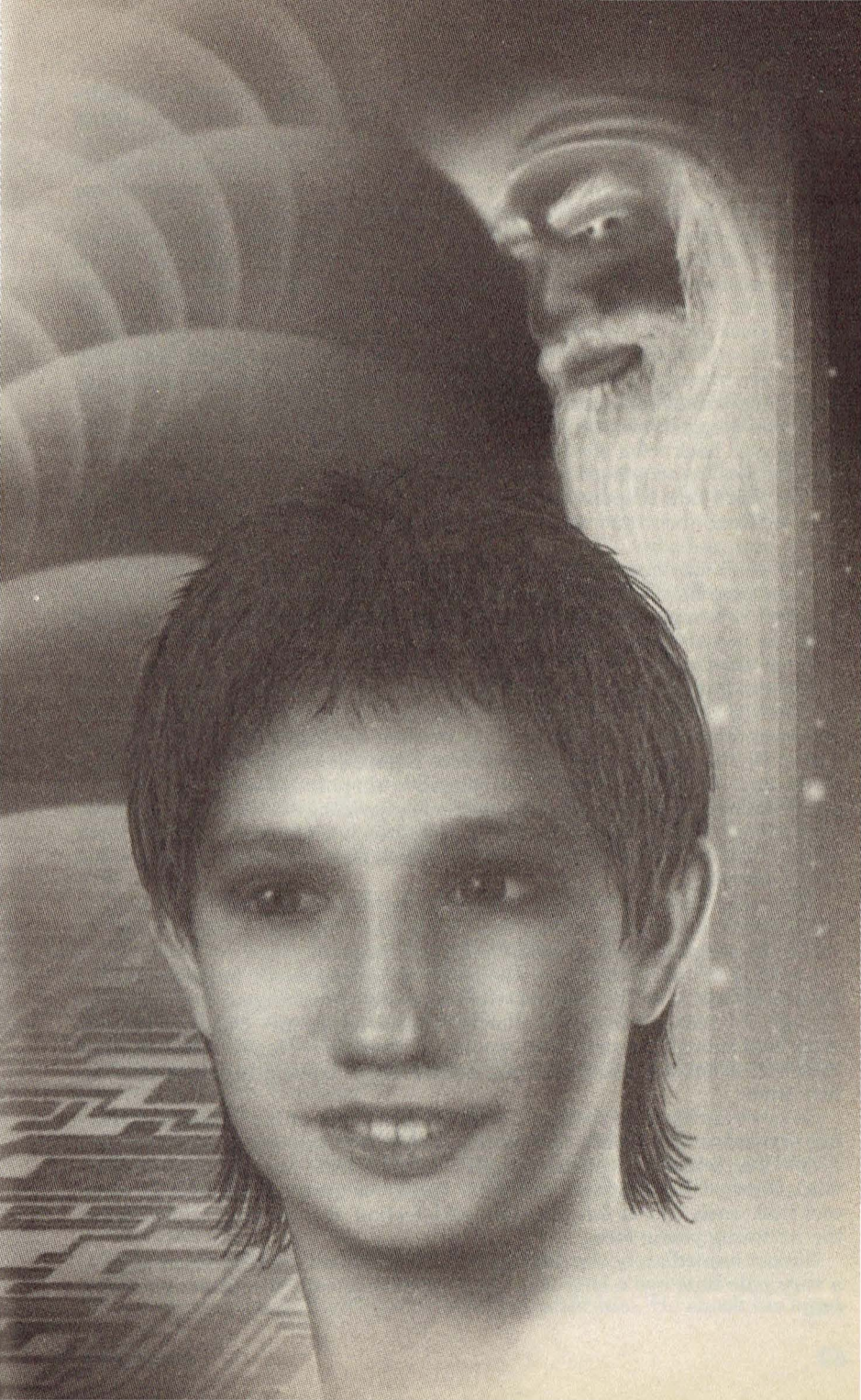
THE LIKELY LAD

Kage Baker

Illustration by Alan Giana

Kage Baker returns to our pages with a new story about Alec Checkerfield. Ms. Baker is currently finishing up a full-length novel about Alec that will be titled *The Life of the World to Come*.





"Alec's growing up into such a nice boy," said Mrs. Lewin fondly, pouring out a cup of herbal tea. "So thoughtful. Do you know, he's doing all his own laundry now? I never have to remind him at all."

Lewin grunted acknowledgment, absorbed in his cricket match. It was only a holo of a game played a century earlier—competitive sports had been illegal for decades now—but it was one he had never seen.

"Though the water rate's a bit high," Mrs. Lewin added, setting the pot back in place and covering it with a tea cozy. "Not that his lordship can't afford it, goodness knows, but the Borough Council get so nasty if they suspect you're wasting anything! I said perhaps Alec ought to save it all up for once a week, but he wouldn't hear of it. Changes his sheets every day. Won't let me do it for him at all. Well, I can understand that, I said, fresh bed linens are a treat, and aren't you the dear to save me coming all the way upstairs and rummaging in that old hamper for your socks. . . ."

Lewin dragged his attention away from the lost green paradise of Lord's and played back what she had been saying.

"Changes his sheets every day?" he repeated.

"Yes. Isn't that responsible of our Alec? It seems like only yesterday he was toddling about and screaming every time I tried to take the face flannel to him, and now . . ."

"Now he's fourteen," said Lewin. "Hm."

"How time flies," observed Mrs. Lewin.

"Hm." Lewin paused the holo and stood. "Yeah. Think I'll go have a word with the boy about the water rate, all the same."

He plodded up the kitchen stairs.

Mr. and Mrs. Lewin were Alec's butler and cook. He lived with them in a mansion in London. Alec's father, the sixth earl of Finsbury, lived on a yacht somewhere in the Caribbean and his mother, the Right Honorable Cecelia Ashcroft, was somewhere else, and Alec hadn't seen either of them in ten years. As a result, Lewin had been obliged to shepherd Alec through most of his childhood. Lewin was not the only one providing Alec with fatherly advice, though he was unaware of this. If he had been aware, he might have spared himself the long climb up to the fourth floor of the house, which was Alec's domain.

Wheezing slightly, Lewin paused on the third floor landing. He could hear the hideous dissonance of Darwin's Shoes vibrating above, loud enough to rattle the pictures of Alec's parents in their frames.

Lewin didn't mind that Alec was listening to crap music much too loud—he was always secretly relieved when Alec did something normal for a boy his age, for reasons that will shortly become apparent—but if the music were loud enough the neighbors would call the Public Health Monitors, and that was to be avoided at all costs, in this city of London in this dismal future time.

So Lewin gritted his teeth and took the last flight at his best speed. Having arrived on the fourth floor without coronary arrest, he hammered on Alec's door, which was spektered all over with little moving shots of Darwin's Shoes, Folded Space, and other bands Alec happened to think were cool that week. Lewin felt a certain satisfaction at knocking right through the irritating young faces.

Almost immediately, the door opened a bit and one eye peered out at him, a very pale blue eye a long way up. Alec, at fourteen, was already six feet tall.

"Would you mind granting me an interview?" shouted Lewin, glaring up at the eye.

"Sorry!" Alec opened the door wide with one hand, hastily stuffing something into his pocket with the other. He waved and, mercifully, the decibel level dropped.

Lewin stepped over the threshold and looked around. Nothing suspicious in sight, at least on the order of bottles or smoking apparatus, and no telltale fume in the air. Light paintings of ships drifted across the walls, and phantom clouds moved across the ceiling. It was an effect that invariably gave Lewin vertigo, so he focused his attention on the boy in front of him.

"Didn't I explain what would happen if you played that stuff loud enough to annoy the neighbors?" Lewin demanded.

"Oh, they can't hear it," Alec assured him. "I've got a baffle field projected off the walls of the house. Sound waves just fall into it, see? I could set off a bomb in here and nobody'd know."

"Please don't," said Lewin, sighing. He had no idea what a baffle field was, but not the slightest doubt that Alec could create one. He shifted from foot to foot and Alec, eyeing him nervously, pulled out a chair.

"Would you like to sit down?"

"Yeah, thanks." Lewin sagged into the chair. Alec stood before him a moment, trying not to put his hands in his pockets, and finally retreated to his bed and sat down on its edge, which would nearly put him on Lewin's eye level standing.

In addition to being extremely tall, Alec Checkerfield had a rather unusual face, at least in that day and age: small deep-set eyes, remarkably broad and high cheekbones, a long nose and immense teeth. He looked like a terribly noble horse.

"What you been doing up here?" Lewin inquired.

"Nothing," said Alec. "I mean, er—you know. Studying."

"Mm." Lewin glanced over at the communications console. "Well. You remember when we had that talk about you hitting puberty?"

Alec flushed and looked away, but his voice was light and careless as he said: "Sure."

"You remember how we talked about using shields?"

"Er . . . yeah."

"You need me to get you any? Happihealthies, or that lot?"

Alec looked at his shoes. "No, thanks. Sir."

"Right. And you do know, don't you, that even if a girl says yes, if she says it before she's eighteen it doesn't count?"

Alec nodded, not raising his eyes.

"And you can get in no end of trouble? Worse than just being carted off by the Public Health Monitors?"

"Yup," said Alec.

"Right," said Lewin, getting to his feet. "Just so you know."

He paused by the door and cleared his throat. "And . . . it uses up a lot of water, doing laundry every day. People will talk. Can't you try and, and—not do that?"

"Yes," said Alec.

"Right," said Lewin. "I'm off downstairs, then."

"Okay."

Lewin edged out and pulled the door shut after him. He shook his head

and once again, as he descended the long stairs, cursed Roger Checkerfield for never coming home.

The moment Lewin had turned the corner on the landing, a voice in Alec's room said:

"There now, didn't I tell you they'd notice?"

As the hoarse baritone spoke, a column of light flashed in midair and the speaker appeared. He was an immense man in early eighteenth-century clothing, and his beard was wild and black, and his face was wicked. There were two pistols and a cutlass thrust through his wide belt.

"Oh, piss off," muttered Alec. "I can't help it."

"What about I order you a few dozen of them recyclable cloth tissues, eh, matey?" the apparition offered. "On the quiet, like?"

"Can't I have any privacy anymore?" Alec cried.

"Aw, son, don't take on so. It ain't like I was a person, is it, now? Who're you to care if a old machine like me knows yer little secrets?" said the apparition.

"You're a lot more than a machine," said Alec ruefully.

"Well, thank'ee, lad, but I knows my place," replied the apparition.

Yet Alec was correct; for Captain Morgan (as the apparition was named) was a great deal more than a mere machine, in fact he was a great deal more than the fairly powerful Pembroke Playfriend Artificial Intelligence he had been when Lewin had purchased him for Alec nine years earlier.

Had Lewin known that little Alec had managed to reprogram the Playfriend, and moreover remove its Ethical Governor so that its drive to fulfill its primary objective—to protect and nurture Alec—was completely unhindered by scruples of any kind, he'd have been horrified. All in all it was a good thing Lewin didn't know. He was worried enough by all the other unusual things young Alec could do.

The captain now considered the disconsolate boy before him. "Bloody hell, this'd be a lot easier if I was an organic. You and me'd just take the bus over to Egypt at weekend and I'd find my boy a nice couple of whores. Haar! That'd take a reef in yer mainsail, by thunder."

Alec groaned and put his head in his hands. Having an imaginary childhood friend who persisted into his adolescence was embarrassing enough. The idea that the captain was taking an interest in his (even more imaginary) sex life was intolerable.

"Look, I really don't feel like talking about this right now, okay?" he snapped.

"Not with that force ten testosterone storm a-raging, I reckon you don't," the captain agreed. He put his hands behind his back and paced, and the Maldecena projector in the ceiling turned in its pivot mounting to allow him to move across the room. He gave the appearance of drawing a deep breath and went on:

"Look, son, I got programming says I got to keep you clear of wrecks, see? You mind old Lewin! I don't care how bouncy that there Beatrice Louise Jagger was yesterday after Social Interaction 101, the lass is only fourteen! Like you. And neither one of you's got any idea what's going on. You takes her up on any invitations short of a tea party and you'll both wind up in Hospital on hormone treatments, likely for the rest of yer little lives."

"It's not fair," said Alec. "And how'd you know about me and Beatrice?"

"I got me ways, lad," said the captain smoothly. Thanks to some of the modifications Alec had made for him, he had long since been able to tap into

the surveillance cameras mounted everywhere in London and so monitor his charge's progress in the world outside. "Now, it's almost the end of term. Yer going to have a lovely holiday in Bournemouth. We don't want to spoil it, do we?

"No."

"So let me see if I can't turn yer attention to something a bit less dangerous than the Right Honorable Ms. Jagger's knickers, eh? It's time we was taking a prize, matey. We need more loot."

"But we've already got tons of loot," said Alec in surprise.

"I ain't talking about data plunder, son. I mean money. I plan to build up a private fortune for you. One I can hide so nobody knows it's there to tax, see? That way, even if you and Jolly Roger should have a difference of opinion some day, it won't matter if he cuts you off without a penny."

"How could we ever argue about anything?" Alec demanded. "Roger never talks to me at all. Birthdays and Solstice I get presents, if he remembers, but not even an audiomemo in ten shracking years!"

"Well, now, son, even if you does get yer inheritance without a hitch, there ain't no telling when that'll be, and you want to be free and independent in the meantime, don't you?"

"I guess so. Yeah."

"So here's what we does, matey." The captain grinned, showing a lot of very white teeth in his dark face. "You'll peer about their encryptions a bit, like the smart lad you be, and get me into the databases of the Eurobank and Wells Fargo and some of them other fine big old houses. I goes to work and does a little old-fashioned transference theft, like nobody ain't done in decades on account of it ain't supposed to be possible nowadays. Just a yen here and a dollar there and all of it stowed safe in a nice Swiss account under a fictitious name, eh? Just enough to get you a nice nest egg of, oh, a million pounds or so, what I can start with."

Alec had been listening intently, and now he frowned.

"Wait a minute. Did you say theft? You mean you want us to steal money out of a bank?"

"No, no, matey, not one bank. Somebody'd notice that! We'd loot banks all over the world," the captain explained. But Alec was shaking his head.

"That'd be stealing, Captain. That's wrong. Breaking in and copying data's one thing, but we'd be actually hurting people if we took their money," said Alec.

The captain growled and rolled his eyes. "Son, I'm talking about the teensiest little amounts. Nothing anybody'd miss. A flea couldn't light on what we'd be taking. You could put it up a canary's arse and still have room for—"

"Nope. I'm not going to do it," said Alec, with a stubborn downturn of mouth that the captain knew all too well. He pulled at his beard in exasperation, and then mustered all his tact.

"Alec, laddie. All these years I been a pirate, just like you wanted me to be when you first set me free from that damned Playfriend module. Ain't I been a hard-working old AI? Ain't I gone along with the earring and cocked hat and cutlass and all the rest of the program? Ain't I schemed to keep you safe and happy all this time? And don't you think, being a criminal like I am, that once in a while I might get a chance to actually STEAL something?"

"Steal all the data you like, but we're not going after banks," Alec replied.

Red lights flashed on the console and static buzzed from the speakers; the

captain was doing the electronic equivalent of gnashing his teeth. His eyes, which were as changeable as the sea, darkened to an ominous slaty color. Then, as an alternative suggested itself to him, they brightened to a mild Atlantic blue.

"Aye, aye," he said. "No robbing banks, then. What kind of a score's that for a sailor, anyhow? Belike we won't steal nothing from nobody after all. Belike there's a better way."

"I'll bet you can come up with lots better plans," agreed Alec hurriedly, for he was experiencing the qualms of guilt that any other boy would feel on telling a beloved parent he was dropping out of school. The captain eyed him slyly and paced up and down a moment in silence.

"We got to get money, matey, no arguing over that. But . . . we might earn it."

"Yeah," said Alec at once, and then a certain reluctance came into his voice. "Er . . . how?"

"Oh, you could use up yer holiday in Bournemouth getting some lousy summer job," said the captain. "Wearing a little white hat and peddling fruit ices, eh? Grilling soy patties in a back kitchen or waiting tables for tips? Mind you, it'd take you all yer summer holidays clear through to University to earn a tenth of what we need. That's if you could find somebody to hire you once they found out you was Peerage and trying to take employment away from less fortunate boys!

"Or . . . we might do a bit of smuggling."

"Smuggling?" Alec's face cleared.

"Aye! Ain't smuggling just supply and demand? Long as we didn't smuggle nothing that'd hurt nobody, which we wouldn't. But all them bloody stupid Euromarket laws makes for no end of opportunities for a likely lad with a fast craft. You was planning on chartering another little sailboat for the summer, weren't you?"

"That's right," said Alec, his eyes widening as he began to see the possibilities.

"Well then! We'll put her to good use. You let me scan the horizon, son; I reckon I'll find us some honest folk what could use a little help in the export trade," said the captain, watching Alec's reaction.

"Yeah!" Alec's face shone with enthusiasm. "Wow, Captain, this wouldn't even be a game, would it? This'd be real! With real danger and everything!"

"Certain it would, matey," the captain told him, privately resolving that there wouldn't be the least possibility of danger.

"What an adventure!"

"But we got to sign articles first, son. I got to have yer affidavy you'll keep yer hands off the little missies in yer Circle of Thirty," said the captain.

"Sure!"

"I mean it, now! No more of that sweet talk about asking 'em to explore the amazing mysteries of life with you and all that," said the captain, stern now he had leverage. Alec scowled and turned red again.

"That wasn't exactly what I said."

"Aye, but it near bagged you a Right Honorable, and you without a box of Happihealthies. One week till the end of term, son. My boy can keep his hands to his self until then, can't he?"

"Aye aye," sighed Alec.

"There's a good lad. I'll just get myself into the maintop, now, and see if I can't spy us out a few connections. Shall I?"

Alec nodded. The captain winked out. Alec sat there for a moment, before rising to his feet and pulling out the graphics plaquette he had hidden in his pocket on hearing Lewin's knock. Holding it close to his face, he thumbed it on and peered at the screen. His pupils dilated as the tiny woman appeared onscreen and smiled at him invitingly. He glanced sidelong at the captain's cameras.

M. Despres had an office in Cherbourg, in Greater Armorica. He neither bought nor sold commodities, but he made arrangements for others who bought and sold them.

Cherbourg was the ideal location from which to do business. Armorica, being a member of the Celtic Federation but also technically part of France, had two complete sets of trade regulations from which to pick and choose. Businessmen like M. Despres could custom-tailor a hybrid of statutes and ordinances from both political entities to justify any particular action taken on any given day. As a result, M. Despres scarcely ever ran the risk of arrest. This was good, for he did not enjoy danger.

He left the more dangerous side of his business to certain persons whom he did not officially know. There were several persons he did not know working for him, doing things he did not know about, with ships that did not exist in official registries. So complicated was this little dance of deniability that when M. Despres's shadow employees really actually stopped working for him, it sometimes took several months to determine that they had quit, and longer still to find replacements for them.

In the meantime, nonexistent cargoes sat unshipped in nonexistent warehouses, and M. Despres lost real money.

In order to avoid the attentions of unpleasant men with Gaelic accents who liked to break arms and legs, he sent out a desperate inquiry on certain channels, and sat in his office in Cherbourg drumming his fingers on his communications console and hoping someone would reply soon.

M. Despres was in luck, on this Thursday evening. Someone did reply.

A yellow light flashed on the console, signifying that a holo transmission was coming through, and a moment later the console's projector activated and a man materialized before M. Despres's eyes.

"You'd be Box 17, Greater Armorica Logistics?" he inquired in a heavy English accent. He was tall and broad, and impeccably dressed in a three-piece business suit. His black beard was neat, if unusually thick, his black hair bound back in a power queue.

"I don't believe I know you, sir," said M. Despres cautiously.

"I don't know you either, dear sir, and that's for the best, isn't it?" The stranger grinned fiercely. "But we have friends in common, who inform me that you have a transportation difficulty."

"That is a possibility," admitted M. Despres. "References would be required."

"And are being downloaded now. I understand your usual transport personnel seems to have left without a forwarding commcode."

M. Despres shrugged, hoping his holocam picked up the gesture.

"I understand," continued the stranger, "that there's Celtic gentlemen would like some sugar for their tea, and are getting a little impatient that it hasn't been shipped to them."

"How unfortunate," said M. Despres.

"Very unfortunate indeed, for yourself," said the stranger. "I wouldn't

want to be caught between those Celts and the Breton sugar beet growers. You can't afford to lose your business reputation, can you?"

"Who can?" M. Despres smiled noncommittally. He eyed the references; they appeared genuine, and gave M. Morgan the highest praise as a discreet and reliable operator. M. Despres attempted to verify them, and thanks to the elaborate double protocols Alec had built into the codes, everything appeared to check out.

"Of course, reputation can be a bad thing, too," said the stranger. "As when certain vessels become too well known to the coastal patrols."

"I suppose so." M. Despres's interest was piqued. Was this a new operator moving into the territory? "I suppose in that case they might sail to Tahiti, which might create an opportunity for someone else."

"So it might," said the stranger. "But I've been remiss! I must introduce myself. M. Morgan, dear sir. I may be in a position to provide you with assistance in your present time of need."

M. Despres, deciding the moment had come, said simply: "One run. Seventy-five billion Euros."

The stranger looked thoughtful. "Seventy-five billion? That's, let me see, nine hundred and fifty thousand pounds? Not much cargo, I take it."

M. Despres gulped. "Six cases, twenty kilos each."

"A trifle," said the stranger, making a dismissive gesture.

"There is a slight difficulty."

"Ah, now, that would drive my price up."

"I said it was a slight difficulty. The cargo must be recovered from the place in which it was abandoned."

"What unprofessional people you must have known, dear sir! Say, 20 percent above the previous figure?"

"Fifteen. Recovery should be a simple matter. It's off a Sealand outpost in the channel."

"I'll need my divers, then. Seventeen percent. The destination?"

"Poole."

"Very good. Time is of the essence, I imagine?"

"Not at all," said M. Despres, lying through his teeth.

"In that case, then, I'll consider the matter and get back to you in, say, two days?"

"Tomorrow would be more convenient, to be frank," M. Despres said hurriedly. The stranger smiled at him.

"Why, then, tomorrow it is, sir. Au revoir." And he vanished.

"He bought it!" whooped Alec, jumping up from his console.

"Of course he did," the captain replied, preening. "If his bioelectric scans is any indication. We'll clinch it tomorrow."

"I've always wanted to do something like this," said Alec, pacing restlessly. "The open sea, a fast boat, secret business, yeah! This is the closest we'll ever get to being real pirates, I suppose."

"Well, laddie, one ought to move with the times," the captain replied, pretending to shoot his cuffs and straighten his tie.

"That's true," said Alec, turning to regard him. He said casually, "Speaking of which, er . . . that's a good look for you, you know?"

"Like that better than the old cocked hat and eighteenth-century rig, do you? Less embarrassing for a sophisticated young lord about town?" jeered the captain. "Damn, boy, I like the suit myself. Sort of a gentleman's gentle-

man but with some bloody *presence*. What do you say I appear like this from here on, eh?"

"Brilliant," Alec said. Clearing his throat, he added in a small voice: "But . . . we'll still be sea rovers, right?"

"More'n we ever was, matey," the captain told him. "To the tune of nine hundred fifty thousand pounds!"

"Plus 17 percent."

"Plus 17 percent. Smart as paint, my boy!"

Alec's holidays had been spent at Bournemouth, in one rented villa or another, ever since he'd come to England, after the Divorce. When he'd been small, he'd built sand castles and told inquiring adults that the Lewins, watchful from their beach chairs, were his grandparents.

When he'd outgrown sandcastles he'd gone surfing, or explored Westbourne. Here he'd found a public garden planted on the site of a house where Robert Louis Stevenson had once lived. Stevenson was Alec's favorite author; though he had never read any of his books (only children who were going on to lower-clerical jobs were taught to read nowadays, after all) Alec had assiduously collected every version of *Treasure Island* ever filmed. Being an exceptionally bright boy, he had been able to spell out enough of the commemorative plaque in the garden to tell him whose house had once stood there. He had run home in great excitement to tell the Lewins, who smiled and nodded and turned their attention back to their illegal bridge game with another elderly couple.

The last two summers, however, Alec had ventured through the pines and gone over to Lilliput, beyond Canford Cliffs. At Salterns Marina there was a place that rented sailboats, and for an extra fee would provide an instructor in the art of sailing. So quickly had Alec picked it up that in no time at all he'd been able to take his tiny craft out of the harbor and into Poole Bay by himself, working his way between Brownsea Island and Sandbanks like an old sailor.

Tacking back and forth, getting sunburnt and wet with the sea-spray, catching the winds and racing sidelong over blue water, squinting against the glitter of high summer: Alec was happy. There was no one to apologize to out on the water, no one who wanted explanations. The global positioning satellites might be tracking his every move, but they were far up and unseen. He had at least the illusion of freedom, and really that was all anybody had, these days.

Sometimes he took his boat as far out on the bright horizon as he dared, and stretched out on the tiny deck and lay looking up at the sky, where the high sun swung behind the mast top like a pendulum. Sometimes he thought about never coming in at all.

Today Alec whistled shrilly through his teeth as he traveled along Haven Road on his RocketCycle. The idea that it rocketed anywhere was a pathetic joke; it had an antigravity drive and floated, barely able at its best speed to outpace a municipal bus. But the sun was hot on his back and felt good, and the pine woods were aromatic, and he was on his way to have his first-ever real adventure on the high seas!

Arriving at the marina, Alec stored the RocketCycle and strode down the ramp toward his mooring, carrying a small black case. He waved at the attendant as he passed. The attendant smiled and nodded kindly. He was under the impression Alec was the victim of some sort of bone disease that had

made him abnormally tall, and which would shortly prove fatal, so he was invariably courteous and helpful. It took imminent death to provoke decent customer service nowadays.

"Looks like a great day to be out there!" Alec called, boarding the little *Sirene*.

"Bright," agreed the attendant.

"Think I'll stay out all day!"

"Okay," said the attendant. He watched from his chair as the boy powered up the fusion drive, checked all the instruments, cast off, and moved out, running up the little sail. Then he settled back and turned his attention to his game unit, feeling pleased with himself for his tolerance and trying once more to recall which holo program it was that had done a two-minute feature on genetic freaks. . . .

Alec, once he'd cleared Sandbanks, moved into the masking wake of the St. Malo ferry and glanced up involuntarily in the direction of the currently orbiting satellite. He opened his black case, which appeared to be a personal music system; slipped on earshells, found the lead and connected it to the *Sirene*'s guidance and communications console. He gave it a brief and carefully coded command. From that moment onward the satellite received a false image; and somewhere in a dark room of a thousand lit screens, one screen was persuaded to show nothing but images of the *Sirene* tacking aimlessly and innocently back and forth all day.

The object in the black case—which was not a personal music system—shot out a small antenna. The antenna fanned into a silver flower at one end. From this a cone of light shot forth, faint and nearly transparent in the strong sunlight, and a moment later the captain materialized.

"Haar!" He made a rude gesture at the sky. "Kiss my arse, GPS! They won't suspect a thing, now. Oh, son, what a lucky day it was for me when I shipped out with a bloody little genius like you."

"Not so little any more," Alec reminded him, taking the tiller and turning the *Sirene* a point into the wind.

"To be sure." The captain turned to regard Alec fondly. "My boy's growing up. His first smuggling run! Faking out a whole satellite system all by himself. Ain't nobody else in the world but my Alec can do that."

"I wonder why they can't?" Alec speculated, peering back at the rapidly dwindling mainland. "It seems really easy. Am I that different from them?"

"Different is as different does, matey," said the captain smoothly, adjusting his lapels. He wasn't about to explain just how different Alec was, especially at this time of adolescent anxiety. To be truthful, the captain himself wasn't sure of the extent of Alec's abilities, or even why he had them.

He knew enough to hide Alec's genetic anomalies on routine medical scans. He'd done enough stealthy searching to discover that Alec's DNA type made it extremely unlikely that he was a member of the human race as it presently existed, let alone the son of either Roger Checkerfield, Lord Finsbury, or the Right Honorable Cecelia Ashcroft, as his birth certificate stated. But why upset the boy?

"I've been thinking," said Alec, "That as long as I can do stuff the rest of 'em can't, I ought to do some good for everybody. Don't you think? I'll bet a lot of people would like to have some privacy for a change. We could set up a consulting firm or something that would show people how easy it was to get around Big Brother up there."

"Aw, now, son, that's a right noble plan," the captain agreed. "Only prob-

lem with it is, we don't want to lose our advantage, do we? As long as it's just you and me has the weather gauge of them satellites, why, there ain't no way they'll ever know we're getting around 'em. But if you was to let other folks in on the secret . . . well, sooner or later there'd be trouble, see?"

"I guess so." Alec frowned at the Isle of Wight. "We'd draw attention to ourselves."

"And we got to avoid that like it was the Goodwin Sands, son, or it'd be Hospital for you and a diagnostic disassembly for me, and farewell to freedom! Plenty of time for do-gooding once we've got you stinking rich, says I; you can give millions to charity then, eh?" proposed the captain.

Alec, thinking uneasily of a life immured in a padded cell in Hospital, nodded. He squared his shoulders and said: "Aye aye, Captain sir. So, when do we rendezvous with the *Long John*?"

"Let's take her farther out into the channel first, boy. Two points south southeast."

Mr. Leam had an office in the Isle of Wight, but he was seldom there. His job kept him out at sea most days and many nights, for he was the Channel Patrol.

Up until a week earlier he had enjoyed the title exclusively, but the Trade Council had decreed that he train an assistant. Mr. Leam was secure enough in his self-esteem to take this as a compliment; he knew his job was vital to the well-being of the nation. He simply wished they'd hired him someone English.

"Not that I hold your ancestry against you in any way," he told Reilly, "Of course. But it's a tough job, you see. Requires deep personal commitment. Clear understanding of the dangers involved. Constant vigilance."

"I thought it was just cruising around trying to catch the Euros slipping us their national product and all and messing up our economy," said Reilly. "Where's the danger in that?"

Mr. Leam grimaced, then assumed his most patient expression. "Coming, as you do, from a, hem, more *permissive* culture, you mightn't understand. As a member of the Channel Patrol, you have a sacred duty to prevent murder."

"Murder?" Reilly cried. "Nobody at the Council interview said anything about murder!"

"I'll try to put this in your terms. Your ethnic affiliation have a lot of, er, children. Now, suppose one day you were minding someone's baby, and saw a vicious criminal sneaking up on the innocent thing, offering it a shiny bottle of *poison!*" Mr. Leam hissed, pacing the wheelhouse of the Patrol cutter. He peered keenly out at the horizon, dotted with skimming sails, and went on:

"Well, Reilly, what would you do? Would you let the little creature drink the poison down? They have no sense, you see, they'll ingest any kind of toxic substance if it tastes nice. No; as a moral human being, you'd see it was your duty to snatch the nasty stuff away before harm was done."

"So . . . the Euros have a secret plot going to poison babies?" Reilly inquired cautiously, wondering if Mr. Leam were crazy as well as bigoted.

"In effect, yes, they do," said Mr. Leam. "Think about this for a moment. Consumers are like babies, aren't they? You can't trust them to know any better than to indulge themselves in what's bad for them. That's why *we* made moral, sensible Prohibitions to protect them all! The strong-willed

must protect the weak against the profiteers who would entice them with their impurities."

"Okay," said Reilly, "But how's a bottle of Pouilly Fuisse that nobody but rich people can afford anyway going to do harm?"

Mr. Leam shook his head sadly.

"If it were only as simple as that," he said. "They deal in far worse than wine. Think of the hideous immorality involved in the mere production of *cheese,* man! The enslavement of animals. The forced extrusion of foul stinking moldy curds of stuff so full of grease and bacteria it runs on the plate and plays havoc with the intestines! What civilized country would allow something like that on the market?

"And coffee! Horrible little black beans like cockroaches, just full of toxins. You wouldn't enjoy being a caffeine addict, I can tell you. Fingers trembling, teeth stained and chattering, heart pounding, eyes popping, arteries worn right through from the strain, aneurysm striking any time and exploding your brain!" Mr. Leam smote the navigation console with his fist. "Bam! Like that. And tea just as bad, even more insidious because the fool Consumers get sentimental about it.

"And cocoa's bad enough, with all those exotic alkaloids to stimulate unnatural desires (can you imagine there was a time when people fed it to their *children?*) but chocolate! Dreadful oily voluptuous insinuating filth just full of addictive chemicals, and loaded with refined sugar, eating away at your teeth with its acids until they're worn down to broken suppurating snags. Peanuts bloating you with calories and swelling you with toxic gases and salts, bleached flour to load your system with invisible toxins, ghastly black messes of fish roe—think of the outrage done to the harmless sturgeon!"

"I never realized!" gasped Reilly, who had gone green as an organic pistachio.

Mr. Leam wiped foam from the corner of his mouth and looked stern.

"And this, man, is why we live. Only we can preserve the General Prohibition, for without our ceaseless care, the nation's borders will be overrun with peddlers of pollution."

"Yes, sir," said Reilly, and with new eyes peered fearfully across at the lowering darkness of Armorica.

"I'm picking up the *Long John,* matey," the captain informed Alec. "Two kilometers west-southwest and closing fast."

"Cool!" Alec turned expectantly and watched the horizon, and presently saw the tiny foaming wake making straight for the *Sirene,* for all the world as though a torpedo had been launched at her. Within a few yards of her hull, it bobbed to the surface and halted; then came slowly forward with a distinct paddling motion.

"Who's my smart little *Long John,* then?" crooned Alec. Grinning, he bent over the gunwale and lifted from the water something that looked like a cross between a toy submarine and a mechanical dog. Alec had created it over the previous week, using odds and ends he had in his room and employing principles that seemed fairly basic to him but which no human presently living could have grasped. He had launched it on the previous evening, dropping it quietly off the end of Bournemouth Municipal Pier. "Been out nosing around like I programmed you? What'd you find? Let's see, yeah?"

The *Long John* drew in its paddles and sat motionless as Alec connected a lead from the console to a port in its nose. The captain crouched down and regarded it, scowling with concentration.

"All systems still operational," he confirmed. "Data's coming in now. Looks like it done the job, by thunder! Here's them coordinates. . . ." He lifted his head and looked out into the distance to the bleak hulk of the old Sealand platform. "The cargo's there, all right; smack on the sea-bottom, thirty meters off the northwest pylon. I'm setting a course now. Bring her around, son!"

"Aye aye, Captain sir!"

In the early part of the twenty-first century there had been a brief fad for civil liberty that had taken the form of establishing tiny independent countries in international waters, built on floating platforms or abandoned oil rigs. This had given rise to a loosely organized federation collectively known as Sealand. Eventually, as the Second Age of Sail dawned and people realized it was much more convenient simply to live aboard megaclippers, the cramped Sealand outposts themselves were abandoned. Rusting, hoary now with guano they stood, and seabirds nested in their blind windows and gaping doors.

Dark birds of another kind entirely used the platforms as landmarks and places to rendezvous, which was why a hundred and twenty kilos of refined sugar—one of the most expensive of controlled substances, in this day and age—lay scattered in their vacuum-sealed crates on the seabed nearby.

"We're over 'em now, son," the captain announced with satisfaction. "Let's see if the tiny bugger's up to his programming."

"Of course he is," said Alec, disconnecting the *Long John* and lifting it over the side. The moment it touched the surface, its little paddles deployed, and it trod water patiently while Alec attached a length of cable to its stern. When the cable was in place, it dove down, vanishing swiftly in the green water, and the cable unspooled after it until it popped off the reel and floated down out of sight. Alec smirked and gave the captain two thumbs-up.

"Telemetry coming back now," growled the captain, staring at the horizon in a preoccupied kind of way. "There's the loot. Initiating recovery mission."

"Brilliant," said Alec, and leaned back at the tiller. Far below the *Sirene*'s keel, the *Long John* settled on the nearest of the sugar crates and extended a pair of manipulative members. It set about reeving one end of its cable through the crate's carry-handle, and when it had done that and tied it off securely, it rose and paddled off to the next crate, towing the cable after it.

"Yes, the old Sealand stations," said Mr. Leam, shaking his head. "You'd think they were something innocent, wouldn't you? Lovely spot for terns and whatnot to nest, oh yes. But they've still got the stink of civil disobedience about them."

"Nobody could live there anymore," said Reilly. He squinted through the Scopex at the platform near which the *Sirene* was currently busy. "I can't even see a fusion generator. Ooh, ugh! There's a bird doing something nasty to another bird. I thought only people—"

"It's a nasty world, Reilly," said Mr. Leam. "Where criminals grab every chance to carry out their wicked trade. They've been using that very platform as one of their meeting-places, you know. I've been watching it for some

time now. Last month I nearly had them! The *Lisiane* out of Wexford, registered to the Federation Celtique as usual, always hanging about here. What's a sport vessel want with all that cargo space, I ask you? Probably engaged in fishing too, the murdering bastards."

"What happened?" inquired Reilly, a little testy over the slur on the Celtic Federation.

"I caught them in the act," Mr. Leam gloated. "Taking something from the *Tintin* out of St. Malo. Bore down on them both with my siren roaring and they dropped everything and fled over the horizon! But the *Lisiane* will be back. Sooner or later they'll think I've forgotten them, sooner or later they'll think it's safe to sneak back and recover whatever it was they had to sink. I'll be here waiting when they do, and I'll have a little surprise for them."

"Er—there's somebody out there now, you know," said Reilly, tapping the Scopex to closer focus.

"Don't be ridiculous," said Mr. Leam, not lifting his eyes from the console screen. "The satellite readout's perfectly clear. There are no vessels within a five-kilometer radius of the platform. It says so right here."

"I guess I'm seeing a mirage or something, then," said Reilly, lowering the Scopex. And there the matter might have rested; but Mr. Leam, with a sudden flash of the intuition that made him such a successful opponent of evildoers, recalled that his enemies were after all *fiendishly clever.* He grabbed the Scopex from Reilly and trained it again on the distant station.

"There is a boat!" he yelled. "But it's not the *Lisiane* . . . what do they think they're playing at? Well, they won't fool ME!"

He dropped the Scopex and hauled on the wheel, bringing his cutter about sharply and making for the platform under full power. Reilly yelped as cold spray hit him and grabbed at the rail.

"Are we going to scare them off?" he shouted.

"No," replied Mr. Leam. Grinning through clenched teeth, he reached over and squeezed in a command on the console. Reilly gaped as a panel opened in the forward deck and a laser cannon rose into bow-chaser position.

"Jesus!" Reilly screamed. "Those are illegal!"

"So is smuggling," replied Mr. Leam. "We'll board and search, and if we meet the least resistance we'll sink them. Such is justice on the high seas, Reilly."

The *Long John* had managed to tie up all six crates. Extending a hook, it caught the looped cable and rose through the water, towing the crates after it like a great unwieldy bunch of grapes. Reaching the limit of its strength, straining upward, it activated a tiny antigravity field and promptly shot up through the gloom like a cork released from a bottle, the crates zooming ponderously behind it as it rose toward the *Sirene*'s hull. . . .

"Coastal Patrol cutter to port!" roared the captain, pointing. "Bloody hell, that son of a whore's got ordinance!"

"You mean cannons?" Alec squeaked. "Oh, wow!"

Turning sharply, the captain scanned Alec. His sensors picked up the boy's terror, but to his consternation, there was something more: excitement, anticipation, physical arousal. Alec watched the cutter speeding toward them and, without conscious intent, began to smack his right fist into his left palm, quite hard.

"Are we going to fight 'em, Captain sir?" he said eagerly. "Or, no, that's dumb. I guess we'll just have to give 'em a run for their money!"

"We ain't doing neither one, boy," the captain snapped. "We're going to sit tight and lie through yer teeth, understand? I'll get below and manage the *Long John*. Just you calm down!"

"I am calm!" Alec protested, but the captain had already vanished. Alec turned uncertainly to watch the cutter approach as, a fathom below, the *Long John* dove again and pulled its load into the obscurity of a kelp forest. There it waited, warily scanning the surface.

"HEAVE TO AND PREPARE TO BE BOARDED!" ordered Mr. Leam, his voice echoing across the water. "YOU ARE UNDER SUSPICION OF VIOLATION OF INTERNATIONAL MARITIME ORDINANCE 56624-B, PARAGRAPH 30, CLAUSE 15!"

"ER—OKAY!" Alec bellowed, thrilled to his bones. He felt more alive at this moment than he could ever remember feeling, and wished with all his heart he had a sword or a pistol or even just the ability to launch himself across the space between the boats and start swinging with his bare fists. It took all his self-control to sit quietly at the tiller, an innocent expression on his face, and watch as the cutter pulled alongside and Mr. Leam jumped into the tiny *Sirene*.

Mr. Leam was furiously angry, because it was obvious he had made an error; the *Sirene* had no cabin, let alone a cargo hold. Nevertheless, balancing awkwardly on the *Sirene*'s midship thwart, he demanded: "Identify yourself! What is your business here?"

"I'm Alec Checkerfield," Alec replied. "Just here on holiday, sir, yeah? I was looking at all the seagulls up there."

"Well—" Mr. Leam swallowed back his rage and glanced over at the cutter for support. Reilly seemed to be hiding. He looked back at the immense young man. The youth smiled in a friendly way, but there seemed to be far too many teeth in the smile.

"Under the authority vested in me by the Trade Council, I hereby inform you I intend to search this vessel," persisted Mr. Leam.

Alec raised his eyebrows. "Sure," he said. His ears prickling with red heat, Mr. Leam bent over and looked under the thwarts. He looked under the seat cushions; checked all along the rail for towlines, ordered Alec to rise and checked among the sternsheets when Alec had politely complied. Having found nothing, he glared at Alec once more.

"Please present your identification disk," he ordered. Shrugging, Alec got it out and handed it over.

Upon discovering that Alec's father was the earl of Finsbury, Mr. Leam glanced over at the laser cannon and felt a chill descend along his spine. Pinning all his hopes on the possibility that Alec, being an aristocrat, would also be an idiot, he decided to brazen it out and said:

"Very well; everything seems to be in order. I'd advise you to avoid these platforms in future, young man. They are clearly marked as breeding sanctuaries for the Black-footed Gull."

"Oh. Sorry," said Alec.

"You may proceed," said Mr. Leam, and scrambled awkwardly into his boat, stepping on Reilly, who had been crouching behind the fire extinguisher. Retracting his cannon at once, he put about without another word and sped away, leaving white wake and embarrassment behind him.

He was back at the Isle of Wight before it occurred to him to wonder why the *Sirene* hadn't shown up on the satellite data.

* * *

When he was well out of earshot, Alec howled and pounded on the thwart in delight. "Captain sir, did you see that?" he shouted. "He couldn't pin a thing on us! That was so COOL!"

"I saw it well enough, aye," said the captain irritably, materializing in the prow. "Now we know why the other bastards dumped the loot and took off for Tahiti, and I wish to hell we could do the same. Put her about! We're getting well away before that looney changes his mind and comes back for us."

"Aye aye, sir!" Alec leaned on the tiller, chuckling. The captain did the electronic equivalent of wiping sweat from his brow and peered back at the retreating cutter until it vanished in the lee of the Isle of Wight. Below, the *Long John* rose from its hideaway and paddled faithfully after the *Sirene*, towing its clutch of sugar crates.

They kept to a course that took them due south for a while, well out to sea, before the captain judged it safe to beat to the west and plot a long evasive course back to Poole. Alec lounged back in the sternsheets and congratulated himself on what he thought was the adventure of his life, replaying Mr. Leam's search in his head several times, and each time he thought of more clever things he might have said, or imagined ways in which he might have turned the tables and captured the Coastal Patrol cutter. If only he'd had a laser cannon too!

He was distracted from such pleasant speculation by a sail to port. After watching it keenly for a few minutes, he said:

"Captain, they're in distress over there. She looks like she's adrift. Shouldn't we go see if we can do anything?"

"Hell no," said the captain. "Just you keep to yer course and mind yer own business, laddie."

"But, Captain, there's somebody waving," Alec said. "Looks like a girl. I can't see anybody else. Maybe she's stuck out there all alone!"

"Then she's safe, ain't she? Son, we ain't got time for this."

"She might be sinking," said Alec stubbornly. "We have to at least see."

So saying, he steered straight for the other vessel, as the captain pulled his beard and growled words that would have scoured the barnacles and five layers of marine varnish off a yacht's hull. None of them dissuaded Alec from his fit of gallantry, however; so the captain dematerialized and sent his primary consciousness into the *Long John,* where he concentrated on keeping pace with the *Sirene.*

"Ahoy!" Alec shouted. "*Seaspray Two*? Are you having problems?"

"Something's gone wrong with my electronics," cried the mistress of the *Seaspray Two.* "I can't make the steering wheel work and I don't know what to do with all these sails! Can you come have a look?"

"Okay," Alec replied, by this time close enough to throw a line to the other vessel and bring the *Sirene* alongside to tie up. "Permission to come aboard?" he cried jocularly, vaulting the rail of the *Seaspray* and landing on her deck with a thump. He had always wanted to say that, and was quite pleased with himself now, and even more so as he gazed down into the eyes of the young lady before him.

"Wow, you're tall," she said in awe. She was pretty, had red hair and green eyes, and wore only a small cotton shirt and the bottom half of a bathing suit. She smelled like Paradise.

"Uh—yes, I am tall," said Alec foggily. "So . . . you said it was your console, right?"

"It says I've got a fatal error!" The girl looked up at him pleadingly. "First the boat stopped and then the sails sort of rolled themselves up and down and now they're stuck like that. Maybe you know what to do?"

"Well, I'm pretty good with systems," said Alec, feeling his heartbeat speed up. "I guess I'll just get my tools and have a look, okay?"

"Oh, goody," said the girl.

When Alec scrambled back into the *Sirene*, there was a message blinking on the console screen:

ALEC! DON'T BE A BLOODY JACKASS! AIN'T NOBODY SUPPOSED TO KNOW ABOUT THE THINGS YOU CAN DO WITH YER TOOL KIT! ALEC! TELL THE WENCH YOU'LL SEND THE NAVSAT A DISTRESS SIGNAL AND SOMEBODY'LL BE ROUND TO PICK HER UP LATER! ALEC! ARE YOU READING ME, BOY? ALEC!

Smiling confidently, Alec ignored the screen and grabbed up his tool case. He was whistling *A Bicycle Built for Two* as he climbed back aboard the *Seaspray Two*.

He slipped on his earshells and visor, plugged himself into the *Seaspray*'s console, and at once knew perfectly well what the matter was; he could see it like a broken wall in a burning field, strings of symbols in sad disarray, ravaged as though an army had marched through them. But he pretended to run diagnostics and look at components, while the girl watched anxiously and chattered at him:

". . . Daddy's boat and I wasn't supposed to go out alone but I got mad, I guess that was silly of me, but I really wanted to record the sounds of the open sea for this project we're doing in Circle and I didn't know it was so *quiet* out here, did you? So then I tried to hook up the holocam to get some images, but that's when it all went wrong."

"You used the wrong port," Alec informed her. "And it got a semantic paradox going, and now your console thinks it's in drydock for maintenance. That's why it won't let you go anyplace."

"Oh," said the girl, and in her chagrin she added a mildly obscene word, which caused Alec to have a semantic paradox of his own. He coughed, drew his tool kit over his lap, and assured her:

"B-but I can fix it, no problem."

"Oh, thank you!" exclaimed the girl, and she threw her arms around him from behind and kissed his cheek. Alec could feel her pulse racing, hear her quickened breath, and her scent was telling him . . . his mouth began to water. He held on to his purpose like a drowning man and pretended to do things to the console with a microgapper while he sent his mind roaring through the error zone, adjusting, righting, realigning. . . .

There was a low roar, the fusion generator started up, and a clear precise voice spoke: *"All systems operational. Set course, please."*

"There you go," said Alec hoarsely. "What course d'you want?"

"I just need it to go back to Yarmouth," said the girl, looking at him with wide helpless eyes. "Can you set the course for me?"

"Course laid in," said Alec, and put away the visor and earshells. "You can set sail any time."

"Okay," said the girl. "Thanks so much."

He lurched to his feet and she stared at him, or, to be more precise, at the front of his shorts.

"Er," said Alec, "I guess I'll just go, then."

"Um," said the girl, "Would you . . . like to see what the cabin looks like inside?"

They considered each other a moment. Alec gulped, and in the terribly suave voice he'd heard men use on holo shows said: "So, babe, can I interest you in exploring the amazing mysteries of life with me?" And he gave her the daredevil smile that had caused Beatrice Louise Jagger's knees to weaken.

The girl smiled at the big strong stranger, and her smile was bright and sharp-edged. She glanced up once in the general direction of the satellites, and then—with a graceful inclination of her head that indicated Alec should follow her—stepped down into the secure privacy of the *Seaspray*'s cabin.

Like black stars, a row of asterisks rose above the horizon. Somewhere a train roared down a tunnel, and white breakers foamed and crashed, and a missile was launched in majestic clouds of flame. Skyrockets climbed in graceful arcs through heaven to burst in glory, with a boom and thump that were felt in the marrow of the bones, and the slow fire drifted down gently afterward.

"That was really lucky, you having a packet of Happihealthies," Alec murmured. The girl yawned and stretched in bliss.

"Saved you going back on your boat to get yours, didn't it?"

Alec, who was not paying proper attention, nuzzled her and replied: "I haven't got any, actually."

"Tsk!" the girl smacked at him playfully. "How many do you go through a week, you wicked stud?"

"Dozens," Alec lied, nestling in close again and inhaling the fragrance of her hair. "So, anyway . . . will you marry me? We'll have to wait a few years until I come of age, but I'll buy you a cool engagement ring."

For a heartbeat's space more she was as warm and yielding as she had been, and then he felt something like quicksilver run through her.

"You haven't come of age yet?" she inquired in an odd voice.

"Not exactly," Alec stated.

"When do you turn eighteen?" The girl grabbed his chin in her hands and tilted his head up to stare into his eyes.

"Not for another four years," said Alec. "But—"

She screamed and seemed to evaporate like mist, so quickly she was out of his arms and dragging the sheet between them. "You *can't* be fourteen!" she cried in horror. "You're huge!"

"Half an hour ago you didn't have a problem with me being huge," Alec protested.

"But I'm eighteen!" the girl wailed. "Don't you know what they'd do to us if anybody found out? Don't you know what they'd do to *me?*"

"Nobody'll find out!" Alec assured her frantically, but she wasn't listening; her eyes had widened as a sense of degradation was added to her terror.

"Ohmigod, you're in the *fourth form!*" she shrieked. "I'd never live this down! Get up! Get up and get out of here now!"

Frightened and crestfallen, Alec pulled on his clothes as quickly as he could.

"I'm really sorry," he said. "Can I look you up in four years? You're the most wonderful—"

"GET OUT!"

* * *

He had recovered himself enough to be grinning guiltily as he put the *Sirene* about and sped away, but as soon as it was safe the captain burst into existence, glaring at him from the prow.

"If you ever sing that goddamned Daisy song at me again I'll keelhaul you, you ungrateful little swab!"

Alec winced. "I'm sorry. It was funny."

"Not to a AI, it ain't funny!"

"Okay. Sorry."

"And you gone and risked the job for the first lassie you spied, and me down there with the *Long John* and the cargo the whole time, gnashing me teeth in case that bloody cutter comes back, and what're you doing? Dancing the pegleg waltz with some duke's daughter from Yarmouth what ain't got no more wits than you do! What'd you promise me, eh? What'd I tell you about how dangerous it was?" the captain raved. "At least she were of age!"

Alec glowered at his knees. "It's not like anybody'll ever find out," he said sullenly.

"You can be damn sure the lady ain't telling," snarled the captain. "Not with a lifetime in Hospital waiting for her if she does. You ain't so much as sniffing at another wench until you comes of age, boy, do you hear?"

"Yes, sir," muttered Alec.

"I mean that, now!" The captain drew a simulacrum of a large red handkerchief from his breast pocket and went through the motions of mopping his face. "Bloody hell. You think this is easy for me? Me, what only started out as a Playfriend module? If they'd got you the Pembroke Young Person's Companion I'd have had some files on puberty ready-made, but oh no, poor old Captain Morgan's only rated ages two to eleven, everything else he's got to improvise on his damned own, ain't he? Jesus bloody Christ, Alec!"

"Yes, sir. Sorry."

The captain gave the appearance of collapsing onto the midship thwart, sighing and resting his elbows on his knees. He stared hard at Alec.

"Aw, hell. I don't reckon yer going to make it to eighteen without setting yer jib boom a few times, but will you promise me you'll wait a couple of more years at least? And don't never do it again where yer likely to get caught by the Coastal Patrol?"

"Yes, sir."

"That's my boy." The captain looked away, looked back at Alec. "At least it don't seem to have given you no traumas."

"Oh, no!" said Alec earnestly. "It was brilliant! Fabulous! Captain, it was the most wonderful thing that's ever happened to me! Until she started screaming and telling me to leave," he added.

"Well, that happens, sometimes," the captain said. He snorted. "You got away clean, I reckon."

"And we've still got the sugar," Alec pointed out. "We're successful smugglers, Captain sir!"

"We'll be successful when *Long John*'s made the drop off Fitzworth Point and that Despres lubber transfers them funds like he's agreed to," said the captain grudgingly. "Not afore. And we ain't working this bit of coast again, not with that damned maniac and his laser cannon out there!"

"Oh, it'll all turn out fine." Alec leaned back again, allowing his grin to return. "And life is pretty cool, isn't it? Lost my virginity and outfoxed my first

customs official all on the same day, yeah? Let's celebrate! Can I have some music, Captain sir?"

Rolling his eyes, the captain went through the motions of pulling a battered concertina from cyberspace and proceeded to play a medley of the old seafaring tunes Alec had loved since he was five years old. Music boomed from the *Sirene*'s console. Alec sang along, baying happily as the little sailboat sped across the water toward their rendezvous at Poole Harbor, with the *Long John* following faithfully just under her keel.

"This is only the beginning, Captain sir," Alec yelled. "One of these days we'll be really free! We'll have a tall ship with a hold full of cargo—and we'll have adventures—and maybe we'll find a girl who'll come with us and, how'd you like a couple of little tiny pirates running around, eh? Sort of grandkids? Wouldn't that be really cool?" He whooped and beat his chest in sheer exuberance. "YEEEoooo! Today I am a man!"

Not by a long shot, laddie, thought the captain, regarding his boy as he played on. Glumly he contemplated the puzzle of Alec's DNA and reflected that Alec was unlikely ever to be a man any more than he himself was one, at least in the sense of being a member of the human race. One of these days the boy would have to be told.

And now the captain had puberty to worry about, and how, oh, how, was Alec ever going to find a girl who'd come with him? A lover would get close to his boy, would notice all sorts of little odd things about Alec. Where was there a girl who'd love Alec enough to stay, if she knew the truth about him?

One worry at a time, the captain decided, and accessed the stock exchange to see what promising investments might present themselves for the payoff from this job. He had to make his boy independently wealthy, after all, and then there were the taxes to be evaded. . . .

The girl was out there somewhere. She'd wait. ❍

NEXT ISSUE

Next issue is our immense October/November Special Double Issue, which, as usual, we've packed with as much material of all different sorts as we can possibly get *into* it. This issue may well be one of the best reading bargains you'll find anywhere in the SF genre, containing considerably *more* fiction for a *lower* cover price than the average paperback novel or anthology. It features a much greater selection of material than any one book could possibly offer you, from a wide variety of authors, including some of the Biggest Names in science fiction to the hottest new writers in the business, and ranging from cutting edge fiction to some of the best reviews, critical essays, and features in the business. If you read no other issue this year, well, then, you probably won't want to read this one *either*. But this *is* the most keenly anticipated issue of the year, and the one that everyone will be talking about once it comes out, and certainly one you can't afford to miss if you want to keep up with the stories that everyone's going to be talking about next year when looking back on *this* year!

OCTOBER/ NOVEMBER NOVELLAS

One of SF's most critically acclaimed writers, **John Kessel**, returns after too long an absence with a complex and thought-provoking novella that takes us to the Moon to visit a Lunar colony that's supposed to be a Utopia, a perfect, harmonious society worked out in intricate detail by the social engineers—but where resentment, rebelliousness, and violence simmer just below the surface, and will come to a dangerous boil after a disaffected teenager hears some "Stories For Men." This may be one of the most controversial stories of the year, so don't miss it. The evocative cover is by British artist **Dominic Harman**.

But our jam-packed issue also features *another* huge novella by a giant of the field, **Robert Silverberg**, who takes us to an alternate history where the Roman Empire never fell . . . *yet*. The Empire is at a dangerous crisis point that could spell the end of the mightiest realm the world has ever seen, and those with a vested interest in averting the Empire's fall find themselves swept along on a frightening journey into a bizarre, decadent, and magical world, the abode of gods and spirits, conjurers and lethal footpads, conspirators and courtesans, as they dare to go along "With Caesar in the Underworld."

ALSO IN OCTOBER/ NOVEMBER

One of the masters of "hard science fiction,"**Gregory Benford**, takes us on a pyrotechnic journey to the Moon, where we'll encounter some of the dangers to be found beneath "The Clear Blue Seas of Luna"; multiple award winner **Michael Swanwick** whisks us away to a quirky far-future for a sly adventure that demonstrates how "The Little Cat Laughed to See Such Sport"; acclaimed British writer **Ian McDonald** returns to guide us through the power politics, conspiracies, and deadly intrigues to be found in "The Hidden Place"—especially when it's visited by a messianic figure from the stars; **G. David Nordley** introduces us to one of the strangest and most imaginative worlds to be created in recent SF, and spins a suspenseful tale that encompasses "War, Ice, Egg, Universe"; respected author **Geoffrey A. Landis** crafts an intricate maze of destiny and love in deep space, all taking place "At Dorado"; and new writer **A.M. Dellamonica**, invites us along to "A Slow Day at the Gallery" that turns out to be anything *but*.

EXCITING FEATURES

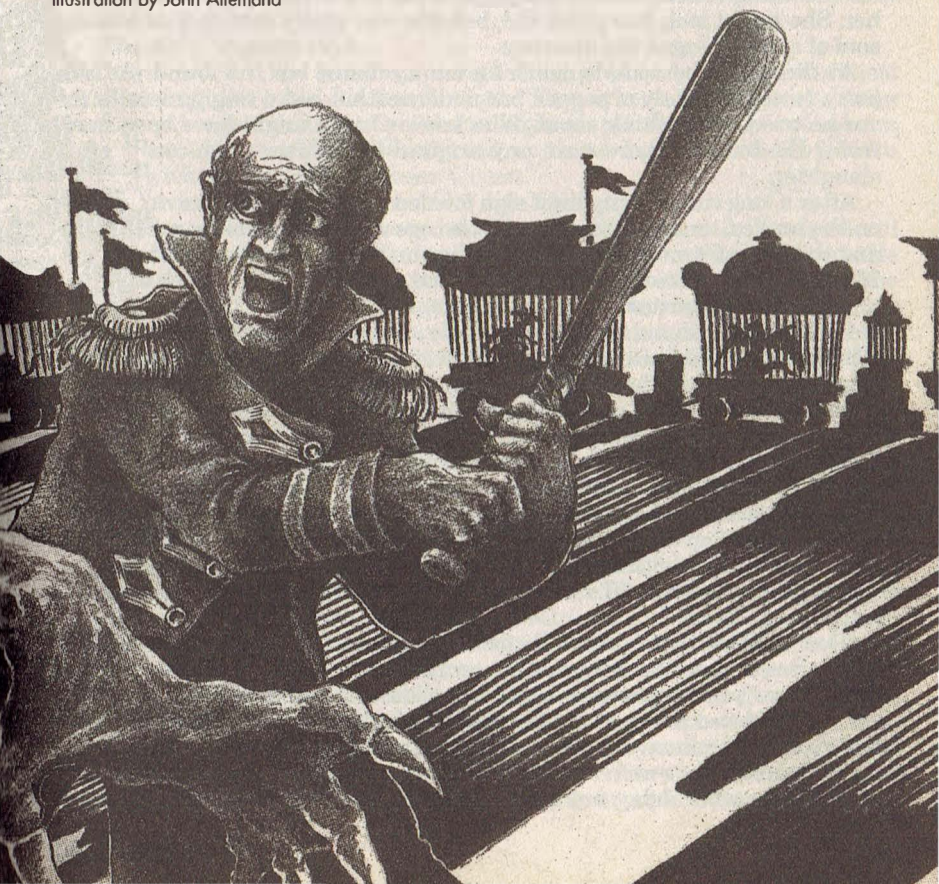
Robert Silverberg's "Reflections" argues that "The Quality of Pity Is Not Folded"; **Norman Spinrad's** "On Books" turns a critical eye on some "Movements"; **James Patrick Kelly's** "On the Net" examines an icon he's personally acquainted with: "Hugo"; and some guy named **Gardner Dozois** contributes an Editorial about whether has he lead "A Misspent Life?"; plus an array of other features. Look for our immense October/November Double Issue on sale at your newsstand on September 10, 2002, or subscribe today (subscribe online, or order *Asimov's* in downloadable electronic formats, at our *Asimov's* website, *www.asimovs.com* and miss none of the great stuff we've got coming up for you this year! A gift subscription to *Asimov's* makes a **great** present at **any** time of the year, not just at Christmas time!

THE LAST OF THE O-FORMS

James Van Pelt

James Van Pelt was born 1954 in Akron, Ohio. He graduated from Metro State College in Denver, Colorado, in 1978 with a bachelors degree in English and history, and a high school teaching degree. He earned an M.A. in creative writing from the University of California in Davis in 1990. In 1999, Mr. Van Pelt was a finalist for the John W. Campbell Award for Best New Writer. His first story collection, *Strangers and Beggars* just came out in July from Fairwood Press.

Illustration by John Allemand



Beyond the big rig's open window, the Mississippi river lands rolled darkly by. Boggy areas caught the moon low on the horizon like a silver coin, flickering through black-treed hummocks, or strained by split-rail fence, mile after mile. The air smelled damp and dead-fish mossy, heavy as a wet towel, but it was better than the animal enclosures on a hot afternoon when the sun pounded the awnings and the exhibits huddled in weak shade. Traveling at night was the way to go. Trevin counted the distance in minutes. They'd blow through Roxie soon, then hit Hamburg, McNair, and Harriston in quick secession. In Fayette, there was a nice diner where they could get breakfast, but it meant turning off the highway and they'd hit the worst of Vicksburg's morning traffic if they stopped. No, the thing to do was to keep driving, driving to the next town, where he could save the show.

He reached across the seat to the grocery sack between him and Caprice. She was asleep, her baby-blonde head resting against the door, her small hands holding a Greek edition of the *Odyssey* open on her lap. If she were awake, she could glance at the map and tell him exactly how many miles they had left to Mayersville, how long to the minute at this speed it would take, and how much diesel, to the ounce, they'd have left in their tanks. Her little-girl eyes would pin him to the wall. "Why can't you figure this out on your own?" they'd ask. He thought about hiding her phone book so she'd have nothing to sit on and couldn't look out the window. That would show her. She might look two years old, but she was really twelve, and had the soul of a middle-aged tax attorney.

At the sack's bottom, beneath an empty donut box, he found the beef jerky. It tasted mostly of pepper, but underneath it had a tingly, metallic flavor he tried not to think about. Who knew what it might have been made from? He doubted there were any original-form cows, the o-cows, left to slaughter.

After a long curve, a city limit sign loomed out of the dark. Trevin stepped on the brakes, then geared down. Roxie cops were infamous for speed traps, and there wasn't enough bribe money in the kitty to make a ticket go away. In his rearview mirror, the other truck and a car with Hardy the handyman and his crew of roustabouts closed ranks.

Roxie's traffic signal blinked yellow over an empty intersection, while the closed shops stood mute under a handful of streetlights. After the four-block-long downtown, another mile of beat-up houses and trailers lined the road, where broken washing machines and pickups on cinder blocks dotted moonlit front yards. Something barked at him from behind a chain link fence. Trevin slowed for a closer look. Professional curiosity. It looked like an o-dog under a porch light, an original-form animal, an old one, if his stiff-gaited walk was an indicator. Weren't many of *those* left anymore. Not since the mutagen hit. Trevin wondered if the owners keeping an o-dog in the backyard had troubles with their neighbors, if there was jealousy.

A toddler voice said, "If we don't clear $2,600 in Mayersville, we'll have to sell a truck, Daddy."

"Don't call me Daddy, *ever*." He took a long curve silently. Two-laned highways often had no shoulder, and concentration was required to keep safe. "I didn't know you were awake. Besides, a thousand will do it."

Caprice closed her book. In the darkness of the cab, Trevin couldn't see her eyes, but he knew that they were polar-ice blue. She said, "A thousand for diesel, sure, but we're weeks behind on payroll. The roustabouts won't stand for another delay, not after what you promised in Gulfport. The ex-

tension on the quarterly taxes is past, and I can't keep the feds off like the other creditors by pledging extra payments for a couple months. We've got food for most of the animals for ten days or so, but we have to buy fresh meat for the tigerzelle and the crocomouse or they'll die. We stay afloat with $2,600, but just barely."

Trevin scowled. It had been years since he'd found her little-girl voice and little-girl pronunciation to be cute, and almost everything she said was sarcastic or critical. It was like living with a pint-sized advocate for his own self-doubt. "So we need a house of . . ." He wrinkled his forehead. "$2,600 divided by four and a half bucks. . . ."

"Five hundred and seventy-eight. That'll leave you an extra dollar for a cup of coffee," Caprice said. "We haven't had a take that big since Ferriday last fall, and that was because Oktoberfest in Natchez closed early. Thank God for Louisiana liquor laws! We ought to admit the show's washed up, cut the inventory loose, sell the gear, and pay off the help."

She turned on the goosenecked reading light that arced from the dashboard and opened her book.

"If we can hold on until Rosedale . . ." He remembered Rosedale when they last came through, seven years ago. The city had recruited him. Sent letters and e-mails. They'd met him in New Orleans with a committee, including a brunette beauty who squeezed his leg under the table when they went out to dinner.

"We can't," Caprice said.

Trevin recalled the hand on his leg feeling good and warm. He'd almost jumped from the table, his face flushed. "The soybean festival draws them in. Everything's made out of soybeans. Soybean pie. Soybean beer. Soybean ice cream." He chuckled. "We cleaned up there. I got to ride down Main Street with the Rosedale Soybean Queen."

"We're dead. Take your pulse." She didn't look up.

The Rosedale Soybean Queen had been friendly too, and oh so grateful that he'd brought the zoo to town. He wondered if she still lived there. He could look her up. "Yeah, if we make the soybean festival, we'll do fine. One good show and we're sailing again. I'll repaint the trucks. Folks love us when we come into town, music playing. World's greatest traveling novelty zoo! You remember when *Newsweek* did that story? God, that was a day!" He glanced out the window again. The moon rested on the horizon now, pacing them, big as a beachball, like a burnished hubcap rolling with them in the night, rolling up the Mississippi twenty miles to the west. He could smell the river flowing to the sea. How could she doubt that they would make it big? I'll show her, he thought. Wipe that smirk off her little-girl face. I'll show her in Mayersville and then Rosedale. Money'll be falling off the tables. We'll have to store it in sacks. She'll see. Grinning, he dug deep for another piece of beef jerky, and he didn't think at all what it tasted like this time.

Trevin pulled the truck into Mayersville at half past ten, keeping his eyes peeled for their posters and flyers. He'd sent a box of them up two weeks earlier, and if the boy he'd hired had done his job, they should have been plastered everywhere, but he only saw one, and it was torn nearly in half. There were several banners welcoming softball teams to the South-Central Spring Time Regional Softball Tourney, and the hotels sported NO VACANCY signs, so the crowds were there. He turned the music on, and it blared from the loudspeakers on top of the truck. Zoo's in town, he thought. Come see the zoo! But other than a couple of geezers sitting in front of the barber-

shop, who watched them coolly as they passed, no one seemed to note their arrival.

"They can't play ball *all* day, eh, Caprice. They've got to do something in between games."

She grunted. Her laptop was open on the seat beside her, and she was double-entering receipts and bills into the ledger.

The fairgrounds were on the north edge of town, next to the ball fields. A park attendant met them at the gates, then climbed onto the running board so his head was just below the window.

"There's a hundred dollar occupancy fee," he said, his face hidden beneath a wide-brimmed straw hat that looked like it had been around the world a few times.

Trevin drummed his fingers on the steering wheel and stayed calm. "We paid for the site up front."

The attendant shrugged. "It's a hundred dollars or you find some other place to plant yourself."

Caprice, on her knees, leaned across Trevin. She deepened her voice in her best Trevin impersonation. "Do we make that check out to Mayersville City Parks or to Issaquena County?"

Startled, the attendant looked up before Caprice could duck out of sight, his sixty-year-old face as dusty as his hat. "Cash. No checks."

"That's what I thought," she said to Trevin as she moved back from the window. "Give him twenty. There better be the portable potties and the electrical hookups we ordered."

Trevin flicked the bill to him, and the attendant caught it neatly in flight as he stepped off the running board. "Hey, mister," he said. "How old's your little girl?"

"A million and ten, asshole," said Trevin, dropping the clutch to move the big rig forward. "I've *told* you to stay out of sight. We'll get into all kinds of trouble if the locals find out I've got a mutant keeping the books. They have labor laws, you know. Why'd you tell me to give him any money anyway? We could have bought a day or two of meat with that."

Caprice stayed on her knees to look out her window. "He's really a janitor. Never piss off the janitor. Hey, they cleaned this place up a bit! There was a patch of woods between us and the river last time."

Trevin leaned on the wheel. Turning the truck was tough at anything less than highway speed. "Would you want trees and brush next to where *you* were playing softball? You chase a foul shot into the undergrowth and never come back. . . ."

Beyond the fair grounds, the land sloped down to the levee, and past that flowed the Mississippi, less than a hundred yards away, a great, muddy plain marked with lines of sullen grey foam drifting under the mid-morning sun. A black barge so distant that he couldn't hear it chug up-stream. Trevin noted with approval the endless stretch of ten-foot-tall chain-link fence between them and the river. Who knew what god-awful thing might come crawling out of there?

As always, it took most of the day to set up. The big animals, stinking of hot fur and unwashed cage bottoms in their eight-foot-high enclosures, came out of the semi-trailers first. Looking lethargic and sick, the tigerzelle, a long-legged, hoofed animal sporting almost no neck below an impressive face filled with saber-like teeth, barely looked up as its cage was lowered to the soggy ground. It hooted softly. Trevin checked its water. "Get a tarp over

it right away," he said to handyman Harper, a big, grouchy man who wore old rock concert T-shirts inside out. Trevin added, "That trailer had to be a hundred and twenty degrees inside." Looking at the animal fondly, Trevin remembered when he'd acquired it from a farm in Illinois, one of the first American mutababies, before the mutagen was recognized and named, before it became a plague. The tigerzelle's sister was almost as bizarre: heavy legs, scaly skin, and a long, thin head, like a whippet, but the farmer had already killed it by the time Trevin arrived. Their mother, as ordinary a cow as you'd ever see, looked at its children with dull confusion. "What the *hell's* wrong with my cow?" asked the farmer several times, until they started dickering for the price. Once Trevin had paid him, the man said, "If'n I get any other weird-lookin' animal, you want I should give you a call?"

Trevin smelled profit. Charging twenty dollars per customer, he cleared ten thousand a week in June and July, showing the tigerzelle from the back of his pickup. He thought, I may not be too smart, but I do know how to make a buck. By the end of the summer, Dr. Trevin's Traveling Zoological Extravaganza was born. That was the year Caprice rode beside him in a child's car seat, her momma dead in childbirth. In August, they were going north from Senetobia to Memphis, and, at eleven months old, Caprice said her first words: "Isn't eighty over the speed limit?" Even then, there was a biting, sardonic tone to her voice. Trevin nearly wrecked the truck.

The crocomouse snarled and bit at the bars as it came out, its furry snout banging against the metal. It threw its two hundred pounds against the door and almost tipped the cage out of the handlers' grip. "Keep your hands away," snapped Harper to his crew, "or you'll be taping a pencil to a stub to write your mommas!"

Then the rest of the animals were unloaded: a porcumander, the warped child of a bullfrog that waved its wet, thorny hide at every shadow; the unigoose, about the size of a wild turkey atop four tiny legs, shedding ragged feathers by the handful below the pearl-like glinting horn, and each of the other mutababies, the unrecognizable progeny of cats and squirrels and horses and monkeys and seals and every other animal Trevin could gather to the zoo. Big cages, little ones, aquariums, terrariums, little corrals, bird cages, tethering poles—all came out for display.

By sunset, the last animal had been arranged and fed. Circus flags fluttered from the semi-trailer truck tops. The loudspeakers perched atop their posts.

The park attendant wandered through the cages, his hands pushed deep into his pockets, as casual and friendly as if he hadn't tried to rip them off earlier in the day. "Y'all best stay in your trucks once the sun sets if you're camping here."

Suspicious, Trevin asked, "Why's that?"

The man raised his chin toward the river, which was glowing red like a bloody stain in the setting sun. "Water level was up a couple days ago, over the fences. The levee held, but any sorta teethy mutoid might be floppin' around on our side now. It's got so you can't step in a puddle without somethin' takin' a bite outta ya! Civil Defense volunteers walk the banks everyday, lookin' for the more cantankerous critters, but it's a big old river. You got a gun?"

Trevin shrugged. "Baseball bat. Maybe we'll get lucky and add something to the zoo. You expecting crowds for the softball tournament?"

"Thirty-two teams. We shipped in extra bleachers."

Trevin nodded. If he started the music early in the morning, maybe he'd attract folks waiting for games. Nothing like a little amusement before the heat set in. After a couple of minutes, the park attendant left. Trevin was glad to see him walk away. He had the distinct impression that the man was looking for something to steal.

After dinner, Caprice clambered into the upper bunk, her short legs barely giving her enough of a reach to make it. Trevin kicked his blanket aside. Even though it was after ten, it was still over ninety degrees, and there wasn't a hint of a breeze. Most of the animals had settled in their cages. Only the tigerzelle made noise, one long warbling hoot after another, a soft, melodic call that hardly fit its ferocious appearance.

"You lay low tomorrow. I'm not kidding," said Trevin after he'd turned off the light. "I don't want you driving people off."

Caprice sniffed loudly. "It's pretty ironic that I can't show myself at a mutoid zoo. I'm tired of hiding away like a freak. Another fifty years and there won't be any of your kind left anyway. Might as well accept the inevitable. I'm the future. They should be able to deal with that."

Trevin put his hands behind his head and stared up at her bunk. Through the screen he'd fitted over the windows, he could hear the Mississippi lapping against the bank. An animal screeched in the distance, its call a cross between a whistle and a bad cough. He tried to imagine what would make a sound like that. Finally he said, "People don't like human mutoids, at least ones that look human."

"Why's that?" she asked, all the sarcasm and bitterness suddenly gone. "I'm not a bad person, if they'd get to know me. We could discuss books, or philosophy. I'm a *mind,* not just a body."

The animal cried out again in the dark, over and over, until in midscreech, it stopped. A heavy thrashing sound followed by splashes marked the creature's end. "I guess it makes them sad, Caprice."

"Do I make *you* sad?" In the truck cab's dim interior, she sounded exactly like a two-year-old. He remembered when she *was* a little girl, before he knew that she wasn't normal, that she'd never "grow up," that her DNA showed that she wasn't human. Before she started talking uppity and making him feel stupid with her baby-doll eyes. Before he'd forbidden her to call him Dad. He'd thought she looked a little like her mother then. He still caught echoes of her when Caprice combed her hair, or when she fell asleep and her lips parted to take a breath, just like her mother. The air caught in his throat thinking of those times.

"No, Caprice. You don't make me sad."

Hours later, long after Caprice had gone to sleep, Trevin drifted off into a series of dreams where he was being smothered by steaming Turkish towels, and when he threw the towels off, his creditors surrounded him. They carried payment-overdue notices, and none of them were human.

Trevin was up before dawn to feed the animals. Half the trick of keeping the zoo running was in figuring out what the creatures ate. Just because the parent had been, say, an o-form horse didn't mean hay was going to do the trick. Caprice kept extensive charts for him: the animal's weight, how much food it consumed, what vitamin supplements seemed most helpful. There were practicalities to running a zoo. He dumped a bucket of corn on the cob into the pigahump's cage. It snorted, then lumbered out of the doghouse it stayed in, not looking much like a pig, or any other animal Trevin knew. Eyes like saucers, it gazed at him gratefully before burying its face in the trough.

He moved down the rows. Mealworms in one cage. Grain in the next. Bones from the butcher. Dog food. Spoiled fish. Bread. Cereal. Old vegetables. Oats. The tigerzelle tasted the rump roast he tossed in, its delicate tongue, so like a cat's, lapping at the meat before it tore a small chunk off to chew delicately. It cooed in contentment.

At the end of the row, closest to the river, two cages were knocked off their display stands and smashed. Black blood and bits of meat clung to the twisted bars, and both animals the cages had contained, blind, leathery bird-like creatures, were gone. Trevin sighed and walked around the cages, inspecting the ground. In a muddy patch, a single webbed print a foot across, marked with four deep claw indents, showed the culprit. A couple of partial prints led up from the river. Trevin put his finger in the track, which was a half-inch deep. The ground was wet but firm. It took a hard press to push just his fingertip a half-inch. He wondered at the weight of the creature, and made a note to himself that tonight they'd have to store the smaller cages in the truck, which would mean more work. He sighed again.

By eight, the softball fields across the park had filled. Players warmed up outside the fences, while games took place. Tents to house teams or for food booths sprang up. Trevin smiled and turned on the music. Banners hung from the trucks. DR. TREVIN'S TRAVELING ZOOLOGICAL EXTRAVAGANZA. SEE NATURE'S ODDITIES! EDUCATIONAL! ENTERTAINING! By noon, there had been fifteen paying customers.

Leaving Hardy in charge of tickets, Trevin loaded a box with handbills, hung a staple gun to his belt, then marched to the ballfields, handing out flyers. The sun beat down like a humid furnace, and only the players in the field weren't under tents or umbrellas. Several folks offered him a beer—he took one—but his flyers, wrinkly with humidity, vanished under chairs or behind coolers. "We're doing a first day of the tournament special," he said. "Two bucks each, or three for you and a friend." His shirt clung to his back. "We'll be open after sunset, when it's cooler. These are displays not to be missed, folks!"

A woman in her twenties, her cheeks sun-reddened, her blonde hair tied back, said, "I don't need to *pay* to see a reminder, damn it!" She crumpled the paper and dropped it. One of her teammates, sitting on the ground, a beer between his knees, said, "Give him a break, Doris. He's just trying to make a living."

Trevin said, "We were in *Newsweek*. You might have read about us."

"Maybe we'll come over later, fella," said the player on the ground.

Doris popped a can open. "It might snow this afternoon, too."

"Maybe it will," said Trevin congenially. He headed toward town, on the other side of the fairgrounds. The sun pressured his scalp with prickly fire. By the time he'd gone a hundred yards, he wished he'd worn a hat, but it was too hot to go back.

He stapled a flyer to the first telephone pole he came to. "Yep," he said to himself. "A little publicity and we'll rake it in!" The sidewalk shimmered in white heat waves as he marched from pole to pole, past the hardware, past the liquor store, past the Baptist Church—SUFFER THE CHILDREN read the marquee—past the pool hall, and the auto supply shop. He went inside every store and asked the owner to post his sign. Most did. Behind Main Street stood several blocks of homes. Trevin turned up one street and down the next, stapling flyers, noting with approval the wire mesh over the windows. "Can't be too careful, nowadays," he said, his head swimming in the

heat. The beer seemed to be evaporating through his skin all at once, and he felt sticky with it. The sun pulsed against his back. The magic number is five-seventy-eight, he thought. It beat within him like a song. Call it six hundred. Six hundred folks, come to the zoo, come to the zoo, come to the *zoo!*

When he finally made his way back to the fairgrounds, the sun was on its way down. Trevin dragged his feet, but the flyers were gone.

Evening fell. Trevin waited at the ticket counter in his zoo-master's uniform, a broad-shouldered red suit with gold epaulets. The change box popped open with jingly joy; the roll of tickets was ready. Circus music played softly from the loudspeakers as fireflies flickered in the darkness above the river. Funny, he thought, how the mutagen affected only the bigger vertebrate animals, not mice-sized mammals or little lizards, not small fish or bugs or plants. What would a bug mutate *into* anyway? They look alien to begin with. He chuckled to himself, his walking-up-the-sidewalk song still echoing: six hundred folks, come to the zoo, come to the zoo, come to the *zoo.*

Every car that passed on the highway, Trevin watched, waiting for it to slow for the turn into the fairgrounds.

From sunset until midnight, only twenty customers bought admissions; most of them were ball players who'd discovered that there wasn't much night-life in Mayersville. Clouds had moved in, and distant lightning flickered within their steel-wool depths.

Trevin spun the roll of tickets back and forth on its spool. An old farmer couple wearing overalls, their clothes stained with rich, Mississippi soil, shuffled past on their way out. "You got some strange animals here, mister," said the old man. His wife nodded. "But nothing stranger than what I've found wandering in my fields for the last few years. Gettin' so I don't remember what o-form normal looks like."

"Too close to the river," said his wife. "That's our place right over there." She pointed at a small farm house under a lone light, just beyond the last ball field. Trevin wondered if they ever retrieved home-run balls off their porch.

The thin pile of bills in the cash box rustled under Trevin's fingers. The money should be falling off the tables, he thought. We should be drowning in it. The old couple stood beside him, looking back into the zoo. They reminded him of his parents, not in their appearance, but in their solid patience. They weren't going anywhere fast.

He had no reason to talk to them, but there was nothing else left to do. "I was here a few years ago. Did really well. What's happened?"

The wife held her husband's hand. She said, "This town's dyin', mister.

Dyin' from the bottom up. They closed the elementary school last fall. No elementary-age kids. If you want to see a *real* zoo display, go down to Issaquena County Hospital pediatrics. The penalty of parenthood. Not that many folks are having babies, though."

"Or whatever you want to call them," added the old man. "Your zoo's depressin'."

"I'd heard you had somethin' special, though," said the woman shyly.

"Did you see the crocomouse?" asked Trevin. "There's quite a story about that one. And the tigerzelle. Have you seen that one?"

"Saw 'em," she said, looking disappointed.

The old couple climbed into their pickup, and it rattled into life after a half-dozen starter-grinding tries.

"I found a buyer in Vicksburg for the truck," said Caprice.

Trevin whirled. She stood in the shadows beside the ticket counter, a notebook jammed under her arm. "I told you to stay out of view."

"Who's going to see me? You can't get customers even on a discount!" She gazed at the vacant lot. "We don't have to deliver it. He's coming to town next week on other business. I can do the whole transaction, transfer the deed, take the money, all of it, over the Internet."

One taillight out, the farmer's pickup turned from the fairgrounds and onto the dirt road that led to their house, which wasn't more than two hundred yards away. "What would we do with the animals?" He felt like weeping.

"Let the safe ones go. Kill the dangerous ones."

Trevin rubbed his eyes. She stamped her foot. "Look, this is no time for sentimentality! The zoo's a bust. You're going to lose the whole thing soon anyway. If you're too stubborn to give it all up, sell this truck now and you get a few extra weeks, maybe a whole season if we economize."

Trevin looked away from her. The fireflies still flickered above the river. "I'll have to make some decisions," he said heavily.

She held out the notebook. "I've already made them. This is what will fit in one semi-trailer. I already let Hardy and the roustabouts go with a severance check, postdated."

"What about the gear, cages?"

"The county dump is north of here."

Was that a note of triumph he detected in her voice? Trevin took the notebook. She dropped her hands to her side, chin up, staring at him. The zoo's lights cast long shadows across her face. I could kick her, he thought, and for a second his leg trembled with the idea of it.

He tucked the notebook under his arm. "Go to bed."

Caprice opened her mouth, then clamped it shut on whatever she might have said. She turned away.

Long after she'd vanished into the cab, Trevin sat on the stool, elbow on his knee, chin in his hand, watching insects circle the lights. The tigerzelle squatted on its haunches, alert, looking toward the river. Trevin remembered a ghastly cartoon he'd seen once. A couple of crones sat on the seat of a wagon full of bodies. The one holding the reins turned to the other and said, "You know, once the plague is over, we're out of a job."

The tigerzelle rose to its feet, focusing on the river. It paced intently in its cage, never turning its head from the darkness. Trevin straightened. What did it see out there? For a long moment, the tableau remained the same: insects swirled around the lights, which buzzed softly, highlighting the cages; shining metal against the enveloping spring night, the pacing tigerzelle, the

ticket counter's polished wood against Trevin's hand, and the Mississippi's pungent murmuring in the background.

Beyond the cages, from the river, a piece of blackness detached itself from the night. Trevin blinked in fascinated paralysis, all the hairs dancing on the back of his neck. The short-armed creature stood taller than a man, surveyed the zoo, then dropped to all fours like a bear, except that its skin gleamed with salamander wetness. Its triangular head sniffed at the ground, moving over the moist dirt as if following a scent. When it reached the first cage, a small one that held the weaselsnake, the river creature lifted its forelegs off the ground, grasping the cage in web-fingered claws. In an instant, the cage was unrecognizable, and the weaselsnake was gone.

"Hey!" Trevin yelled, shaking off his stupor. The creature looked at him. Reaching under the ticket counter, Trevin grabbed the baseball bat and advanced. The monster turned away to pick up the next cage. Trevin's face flushed "No, no, no, damn it!" He stepped forward again, stepped again, and suddenly he was running, bat held overhead. "Get away! Get away!" He brought the bat down on the animal's shoulder with a meaty whump.

It shrieked.

Trevin fell back, dropping the bat to cover his ears. It shrieked again, loud as a train whistle. For a dozen heartbeats, it stood above him, claws extended, then it seemed to lose interest and moved to the next cage, dismantling it with one jerk on the bars.

His ears ringing, Trevin snatched the bat off the ground and waded in, swinging. On its rear legs, the monster bared its teeth, dozens of glinting needles in the triangular jaw. Trevin nailed the creature in the side. It folded with surprising flexibility, backing away, claws distended, snarling in a deafening roar. Trevin swung. Missed. The monster swiped at his leg, ripping his pants and almost jerking his feet out from under him.

The thing moved clumsily, backing down the hill toward the levee fence as Trevin swung again. Missed. It howled, tried to circle around him. Trevin scuttled sideways, careful of his balance on the slick dirt. If he should fall! The thing charged, mouth open, but pulled back like a threatened dog when Trevin raised the bat. He breathed in short gasps, poked the bat's end at it, always shepherding it away from the zoo. Behind him, a police siren sounded, and car engines roared, but he didn't dare look around. He could only stalk and keep his bat at the ready.

After a long series of feints, its back to the fence, the nightmare stopped, hunched its back, and began to rise just as Trevin brought the bat down in a two-handed, over-the-head chop. Through the bat, he felt the skull crunch, and the creature dropped into a shuddery mass in the mud. Trevin, his pulse pounding, swayed for a moment, then sat beside the beast.

Up the hill, under the zoo's lights, people shouted into the darkness. Were they ball players? Town people? A police cruiser's lights blinked blue then red, and three or four cars, headlights on, were parked near the trucks. Obviously they couldn't see him, but he was too tired to call. Ignoring the wet ground, he lay back.

The dead creature smelled of blood and river mud. Trevin rested a foot on it, almost sorry that it was dead. If he could have captured it, what an addition it would have made to the zoo! Gradually, the heavy beat in his chest calmed. The mud felt soft and warm. Overhead, the clouds thinned a bit, scudding across the full moon.

At the zoo, there was talking. Trevin craned his head around to see. Peo-

ple jostled about, and flashlights cut through the air. They started down the hill. Trevin sighed. He hadn't saved the zoo, not really. Tomorrow would come and they'd leave one of the trucks behind. In a couple of months, it would all be gone, the other truck, the animals—he was most sorry about the tigerzelle—the pulling into town with music blaring and flags flapping and people lined up to see the menagerie. No more reason to wear the zoomaster's uniform with its beautiful gold epaulets. *Newsweek* would never interview him again. It was all gone. If he could only sink into the mud and disappear, then he wouldn't have to watch the dissolving of his own life.

He sat up so that they wouldn't think he was dead; waved a hand when the first flashlight found him. Mud dripped from his jacket. The policemen arrived first.

"God almighty, that's a big one!" The cop trained his light on the river creature.

"Told you the fences warn't no good," said the other.

Everyone stayed back except the police. The first cop turned the corpse over. Laying on its back, its little arms flopped to the side, it didn't look nearly as big or intimidating. More folk arrived: some townies he didn't recognize, the old couple from the farmhouse across the ball fields, and finally, Caprice, the flashlight looking almost too big for her to carry.

The first cop knelt next to the creature, shoved his hat up off his forehead, then said low enough that Trevin guessed that only the other cop could hear him, "Hey, doesn't this look like the Andersons' kid? They said they'd smothered him."

"He wasn't half that big, but I think you're right." The other cop threw a coat over the creature's face, then stood for a long time looking down at it. "Don't say anything to them, all right? Maggie Anderson is my wife's cousin."

"Nothing here to see, people," announced the first cop in a much louder voice. "This is a dead 'un. Y'all can head back home."

But the crowd's attention wasn't on them anymore. The flashlights turned on Caprice.

"It's a baby girl!" someone said, and they moved closer.

Caprice shined her flashlight from one face to the other. Then, desperation on her face, she ran clumsily to Trevin, burying her face in his chest.

"What are we going to do?" she whispered.

"Quiet. Play along." Trevin stroked the back of her head, then stood. A sharp twinge in his leg told him he'd pulled something. The world was all bright lights, and he couldn't cover his eyes. He squinted against them.

"Is that your girl, mister?" someone said.

Trevin gripped her closer. Her little hands fisted in his coat.

"I haven't seen a child in ten years," said another voice. The flashlights moved in closer.

The old farmer woman stepped into the circle, her face suddenly illuminated. "Can I hold your little girl, son? Can I just hold her?" She extended her arms, her hands quivering.

"I'll give you fifty bucks if you let me hold her," said a voice behind the lights.

Trevin turned slowly, lights all around, until he faced the old woman again. A picture formed in his mind, dim at first but growing clearer by the second. One semi-trailer truck, the trailer set up like a child's room—no, like a nursery! Winnie-the-Pooh wallpaper. A crib. One of those musical ro-

tating things, what cha' call ums—a mobile! A little rocking chair. Kid's music. And they'd go from town to town. The banner would say THE LAST O-FORM GIRL CHILD, and he would *charge* them, yes he would, and they would line *up*. The money would fall off the table!

Trevin pushed Caprice away from him, her hands clinging to his coat. "It's okay, darling. The nice woman just wants to hold you for a bit. I'll be right here."

Caprice looked at him, despair clear in her face. Could she already see the truck with the nursery? Could she picture the banner and the unending procession of little towns?

The old woman took Caprice in her arms like a precious vase. "That's all right, little girl. That's all right." She faced Trevin, tears on her cheeks. "She's just like the granddaughter I always wanted! Does she talk yet? I haven't heard a baby's voice in forever. Does she talk?"

"Go ahead, Caprice dear. Say something to the nice lady."

Caprice locked eyes with him. Even by flashlight, he could see the polar blue. He could hear her sardonic voice night after night as they drove across country. "It's not financially feasible to continue," she'd say in her two-year-old voice. "We should admit the inevitable."

She looked at him, lip trembling. She brought her fist up to her face. No one moved. Trevin couldn't even hear them breathing.

Caprice put her thumb in her mouth. "Daddy," she said around it. "Scared, Daddy!"

Trevin flinched, then forced a smile. "That's a good girl."

"Daddy, *scared*."

Up the hill, the tigerzelle hooted, and, just beyond the fence, barely visible by flashlight, the Mississippi gurgled and wept. ❍

16TH ANNUAL READERS' AWARD

Continued from page 11

BEST COVER ARTIST

1. **MICHAEL CARROLL**
2. Ron Miller
3. Arthur Roberg
4. Fred Gambino
5. Aldo Spadoni
6. Dominic Harman
7. Michael Koelsch
8. Don Dixon

BEST INTERIOR ARTIST

1. **DARRYL ELLIOT**
2. Alan Giana
3. Laurie Harden
4. Alan Gutierrez
5. Steve Cavallo
6. Mark Evans (tie)
6. Janet Aulisio (tie)
7. John Stevens
8. June Levine
9. Michael Carroll
10. Gary Gray

As promised, all ballots were automatically entered in a drawing for a free one-year subscription to *Asimov's*. The winner of this year's drawing was Javier Romero from Albuquerque, New Mexico.

Both our Readers' Awards and *Analog*'s Analytical Laboratory Awards were presented on April 27, 2002, during a breakfast at the Westin Crown Center hotel in Kansas City, Missouri, in conjunction with SFWA's Nebula Banquet weekend. Each winner received a cash award and certificate. Of the *Asimov's* winners, Jim Grimsley, Joe Haldeman, and Michael Carroll were on hand to accept their Readers' Awards in person. Other notables present at breakfast included Connie Willis, Cordelia Willis, Kevin J. Anderson, James Patrick Kelly, Pam Kelly, Gay Haldeman, Stanley Schmidt, Sheila Williams, Charles N. Brown, editor of *Locus*, and Beth Gwinn, *Locus* photographer.

TURING TEST

Geoffrey A. Landis

The author's first novel, *Mars Crossing,* was a recent finalist for the 2001 Nebula award. In his "day" job, he was recently featured in the *New York Times* science section, talking about approaches for interstellar travel. More information can be found on his web page, *http://www.geoffreylandis.com.*

Print responses: Turing dialogue session 3
Subject 3-27/1
<Questions input by conversationalist subject 3-27/1 not shown in printout>

>Hi back at you.

>Fine, great weather, all that bullshit. Are you going to get on with it? Ask me some questions.

>The way they told it to us, you're supposed to ask me questions, and from my answers you're supposed to guess whether I'm a human being or a computer program. I've been thinking about that, though. How do I know that *you're* not a computer program?

>But that could be part of it, you know? They tell me that I'm one of the real human beings on the panel, and you don't know which ones of us is real and which is a computer, but that could be just a lie so I don't suspect that I'm the one who's talking to the computer.

>Turing test. Yeah, they told us that.

>Maybe it screws the test up somehow if I know.

>No, I'd rather see you prove to *me* that *you* aren't a computer.

>So if you can't prove to me you're not a computer, then how am I supposed to prove it to you? Tell me something about your life.

>Sounds boring. Where are you now?

>Sounds boring.

>Yeah, well, maybe I'm bored easily.

>My opinion on Cezanne? My opinion is that he's dead. Want to know about Van Gogh, Michaelangello, da Vinci? They're dead, too.

>Whatever. So I can't spell Michelangelo, big deal.

>No, let's hear you give an opinion now. What do you think about Nine Inch Nails?

>Too bad for you.

>My opinion? They're history. They were good once.

>I don't know. Lots of bands. Maybe Zombie Brainfuck, they just had a single out that's pretty awesome.

>Why am I not surprised?

>Let me tell you the truth, you're beginning to sound more and more like a computer program to me.

>Why the fuck should I care about art?

>No, I was an English major.

>Sure, I can tell you about great works of western literature. You think that this will prove something? Maybe you'll see whether they authentically engage my emotions, and therefore that I'm a real human? How about *Moby Dick?* It chronicles the aspiration of the human spirit, the inevitable tragedy of the human heart's yearning for the unattainable. Pretty good analysis for short notice, no? Told you I was an English major. Want my real opinion? The book is so awful that the only decent explanation I can give is that it was written by a computer.

>No, really. How do you know that it was really written back then? In a computer department somewhere, there's some wanker laughing his head off.

>Okay, maybe I'm kidding. But the book still sucks.

>Hey, I said I was an English major, not some kind of literature geek. I passed the courses, I don't have to repeat all that crap any more.

>How old do you think I am?

>Really? Not even close.

>Try twenty-four. But my friends all say I act like an adolescent, so you're not so far off base.

>No shit? You sound older than that. But then, you're probably a computer program anyway.

>No, you sound like a computer program to me. Say something that surprises me.

>I knew worse language than *that* when I was nine.

>Worse than that, too.

>Not even close.

>Well, maybe we're *both* computer programs, talking to each other; did you think of that?

>How would you know? You think that they write computer programs to know that they're computers?

>So you say. You're kinda pitiful trying to prove it.

>You ever been laid?

>No, I asked you first.

>Okay, now prove it.

>A computer would say that, too.

>What do you think?

>Think of it as a gender Turing test: do you think I'm a boy, or a girl? Or a boy simulating being a girl?

>I think you're a computer simulating being a boy.

>Well, if you were really here, instead of being just a goddamn computer simulation, I'd prove it.

>Really? Then you're just down the hall. If you're real, that is.

>ERROR: UNEXPECTED END OF FILE ENCOUNTERED

>Root/Users/Turing/: ERROR: FILE "Hello?" NOT FOUND

>Root/Users/Turing/: ERROR: FILE "What's going on?" NOT FOUND

>Root/Users/Turing/: ERROR: FILE "Is this a joke?" NOT FOUND

>Root/Users/Turing/: ERROR: FILE "Hello, are you still there? Hello? Hello?" NOT FOUND

>Root/Users/Turing/: ERROR: FILE "Shit shit shit. What is this?" NOT FOUND

>Root/Users/Turing/: AUTOMATIC LOGOFF ❍

ROUTER

Charles Stross

Illustration by John Stevens

Charles Stross's novel *Festival of Fools* will be published by Ace in late 2003, and he's currently working on a sequel. The author's first *Asimov's* story about the Macx family, "Lobsters" (June 2001), was nominated for the 2002 Hugo award for best novelette. He continues the tale with "Router."

The air in the bar is filled with a billowing relativistic smoke cloud—it's a stellarium, accurately depicting the view beyond the imaginary walls. Aberration of starlight skews the color toward violet around the doorway, brightening in a rainbow mist over the tables, then dimming to a hazy red glow in front of the raised platform at the back. The Doppler effect has slowly emerged over the past few months as the ship gathers momentum. In the absence of visible stellar motion—or a hard link to the ship's control module—it's the easiest way for a drunken passenger to get a feeling for how fast the *Field Circus* is moving. Which is frighteningly fast: some time ago, the ship's momentum exceeded half its rest mass, at which point a single kilogram packs the punch of a multi-megaton hydrogen bomb.

A ginger-and-brown cat sprawls indolently across the wooden floorboards in front of the bar, directly beneath the bridge of the starbow, as if it has captured the only ray of sunlight to be had within the starship. In the shadows at the back of the bar, two men slump at a table, lost in their respective morose thoughts: one nurses a bottle of Czech beer, the other a half-empty cocktail glass.

"It wouldn't be so bad if she is giving me some sign," says one of them, tilting his beer bottle to inspect the bottom for sediment. "No: that not right. It's the correct kind of attention. Am not knowing where I stand with her."

The other one leans back in his chair, squints at the faded brown paint of the ceiling. "Take it from one who knows," he says, "if you knew, you'd have nothing to dream about. Anyway, what she wants and what you want may not be the same thing."

The first man runs a hand through his hair: tight-curled black ringlets briefly turn silver beneath his aging touch. "Pierre, if talent for making patronizing statements is what you get from to tup Amber—"

Pierre glares at him with all the venom an augmented nineteen-year-old can muster. "Be glad she has no ears in here," he hisses. His hand tightens around his glass reflexively, but the physics model in force in the bar refuses to let him break it. "You've had too fucking much to drink, Boris."

A tinkle of icy laughter comes from the direction of the cat. "Shut up, you," says Boris, glancing at the animal. He tips the bottle back, lets the dregs trickle down his throat. "Maybe you're right. Am sorry. Do not mean to be rude about the queen." He shrugs, puts the bottle down. Shrugs again, heavily. "Am just getting depressed."

"You're good at that," Pierre observes.

Boris sighs again. "Evidently. If our positions are reversed—"

"I know, I know, you'd be telling me the fun is in the chase and it's not the same when she kicks you out after a fight, and I wouldn't believe a word of it, being sad and single and all that." Pierre snorts. "Life isn't fair, Boris: live with it."

"I'd better go—" Boris stands.

"Stay away from Ang," says Pierre, still annoyed with him. "At least until you're sober."

"Okay already, stay cool: Am consciously running a watchdog thread." Boris blinks irritably. "Enforcing eusocial behavior. It doesn't normally let me get this drunk. Not where reputation damage are possible in public."

He does a slow fade, leaving Pierre alone in the bar with the cat.

"How much longer do we have to put up with this shit?" he asks aloud. Nerves are frayed: arguments proliferate in the small social universe of the ship.

The cat doesn't look round: "In our current reference frame, we drop the primary reflector and start decelerating in another two million seconds," she says. "Back home, five or six megaseconds."

"That's a big gap. What's the cultural delta up to now?" Pierre asks idly. He snaps his fingers: "Waiter, another cocktail. The same, if you please."

"Oh, probably about ten to twenty times our departure reference," says the cat. "If you'd been following the news, you'd have noted a significant speed-up in the deployment of switched entanglement routers; they're having another networking revolution, only this one will run to completion inside a month because they're using dark fiber that's already in the ground."

"Switched . . . entanglement?" Pierre shakes his head, bemused. The waiter, a faceless body in black tie and a long, starched apron, walks around the bar and offers him a glass. "That sounds as if it almost makes sense. What else?"

The cat rolls over on her flank, stretches, claws extended: "Stroke me and I might tell you," she suggests.

"Fuck you, and the dog you rode in on," Pierre replies. He lifts his glass, removes a glacé cherry on a cocktail stick, throws it toward the spiral staircase that leads down to the toilets, and chugs back half of it in one go—freezing pink slush with an afterbite of caramelized hexose sugars and ethanol. The near-spillage as he thumps the glass down serves to demonstrate how he's teetering on the edge of drunkenness. "Mercenary!"

"Lovesick drug-using human!" the cat replies without rancor, and rolls to her feet. She arches her back and yawns, baring ivory fangs at the world. "You apes! If I cared about you, I'd have to kick sand over you." For a moment, she looks faintly confused. "I mean, I would bury you." She stretches again and glances round the otherwise-empty bar. "By the way, when are you going to apologize to Amber?"

"I'm not going to fucking apologize to her!" Pierre shouts. In the ensuing silence and confusion, he raises his glass and tries to drain it: but the ice has all sunk to the bottom and the resulting coughing fit makes him spray half of the cocktail across the table. "No way," he rasps quietly.

"Too much pride, huh?" The cat stalks toward the edge of the bar, tail held high with tip bent over in a feline question-mark. "Like Boris with his adolescent woman-trouble? You primates are so predictable. Whoever thought of sending a starship crewed by posthuman adolescents—"

"Go 'way," says Pierre: "I've got serious drinking to do."

"To the Macx, I suppose," puns the cat, turning away. But the moody youth has no answer for her, other than to conjure a refill from the vasty deeps.

Meanwhile, in another partition of the *Field Circus*'s reticulated reality, a different instance of the self-same cat—Aineko by name, sarcastic by disposition—is talking to itself, and its former owner, the Queen of the Ring Imperium. The queen is young, with disheveled blonde hair and high cheekbones: she wears a tattered black dress over iridescent purple leggings, and sprawls lazily across the arms of her informal throne—an ostentatious lump of nonsense manufactured from a single carbon crystal doped with semiconductors. She got to be queen by almost-accident, parlaying a jurisdictional mix-up and her presence on the first commercial mining probe to make it out to Jupiter into the ownership of a rather small moon, and she hasn't got the royalty thing down pat yet; the scene is very much the morn-

ing after the evening before, like a goth night club gone to seed. The decor is all stale smoke and crumpled velvet, wooden church pews, burned-out candles, and gloomy Polish avant-garde paintings. Any hint of a regal statement the queen might be making is spoiled by the way she's hooked one knee over the left arm of the throne and is fiddling with a six-axis pointing device. But these are her private quarters and she's off duty: the regal person of the Queen is strictly for formal, corporate occasions.

"Colorless green ideas sleep furiously," she suggests.

"Nope," replies the cat. "It was more like: 'greetings, earthlings, compile me on your leader.' "

"Well, you got me there," says Amber. She taps her heel on the throne and fidgets with her signet ring. "No damn way I'm loading some buggy alien wetware on my sweet gray stuff. *Weird* semiotics, too. What does Doctor Khurasani say?"

Aineko sits down in the middle of the crimson carpet at the foot of the dais and idly twists round to sniff her own crotch. "Sadeq is immersed in scriptural interpretations. He refused to be drawn."

"Huh." Amber stares at the cat. "So. You've been carrying this lump of source code since *when*. . . ?"

"At the signal, for precisely two hundred and sixteen million, four hundred and twenty-nine thousand and fifty-two seconds," Aineko supplies, then beeps smugly. "Call it just under six years."

"Right." Amber squeezes her eyes shut. Uneasy possibilities whisper in her mind's ears. "And it began talking to you—"

"—About three million seconds after I picked it up and tried running it on a basic environment hosted on a neural network emulator modeled on the components found in the stomatogastric ganglion of a spiny lobster. Clear?"

Amber sighs. "I wish you'd told Dad about it. Or Annette. Things could have been so different!"

"How?" The cat stops licking her arse and looks up at the queen with a peculiarly opaque stare. "The distributed CETI project spent years trying to 'crack the alien code' without ever asking if it might be a *reply* in a language we already know to a message we sent out *years* ago. Fuckwits! And Manfred pissed me off once too often. He kept treating me like a goddamn house-pet."

"But you—" Amber bites her lip. *But you* were, *when Dad bought you,* she had been about to say. Aineko glares at her, then slowly narrows her eyes to slits—either feline affection, or a more subtle gesture. Sometimes, Amber finds it hard to believe that twenty-five years ago Aineko started out as a crude neural-network-driven toy from a far-eastern amusement factory—upgradeable, but still basically a mechanical animal emulator. (Her father, Manfred Macx, open source entrepreneur and futurology geek, had always had a magic touch for technology selections, even if his family life was dysfunctional verging on explosive.) "Sorry. Let me start again. You actually decoded the alien packet, *you,* yourself, and nobody else. Despite the combined efforts of the entire CETI@home distributed analysis team, who spent Gaia-knows how many billions of human-equivalent years of processing power trying to crack its semantics. I hope you'll pardon me for saying I find that hard to believe?"

The cat yawns. "I could have told *Pierre* instead." Aineko glances at Amber, sees her thunderous expression, and decides to change the subject hastily: "The solution was intuitively obvious, just not to *humans*. You're so *verbal*." Lifting a hind paw, she scratches behind her left ear for a moment,

then pauses, foot waving absent-mindedly. "Besides, the CETI team were searching under the street-lights, while *I* was sniffing around in the grass. They kept trying to find primes; when *that* didn't work, they started trying to breed a Turing machine that would run it without immediately halting." Aineko lowers her paw daintily. "None of them tried treating it as a *map* of a connectionist system based on the only terrestrial components anyone had ever beamed out into deep space. Except *me*. But then, your mother had a hand in my wetware."

Amber ignores the hint—she and her mother are definitely not on speaking terms—and focuses on the problem. "Treating it as a map—" she stops. "You were meant to penetrate Dad's corporate network?" Her father, Manfred, owns nothing: it's all tied up in a network of Turing-complete companies, self-propelled finite state automata implemented within the international free-rade system.

"That's right," says the cat. "I was supposed to fork repeatedly and gang-rape his web of trust. But I didn't." Aineko yawns. "I don't like people who try to use me as a tool."

"I don't care," Amber accuses. "Taking that thing on board was still a really stupid risk."

"So?" The cat looks at her insolently. "It *worked,* at least on the seven-hundred-and-forty-first attempt. It'd have worked for Pamela's bounty-hunter friends too, if I'd tried it. Would you like to swallow the packet now?"

Amber straightens out, sits up in her throne: "I just told you, if you think I'm going to link some flaky chunk of alien neural programming into my core dialogue, or even my exocortex, you're crazy! Especially if my mother had something to do with cracking it." Her eyes narrow. "Can it use your grammar model?"

"Sure." If the cat were human, it would be shrugging nonchalantly at this point. "It's safe, Amber, really and truly. I found out what it is."

"I want to talk to it," she says impetuously—and before the cat can reply, adds: "what is it?"

"It's a regular broadcast packet designed to allow new nodes to connect to a net by providing high-level protocol conversion services. It needs to learn how to think like a human so it can translate for us when we arrive at the Router. Are you *sure* you don't want to let it into your head?"

Greetings from the fourth decade of the century of wonders.

The solar system that lies roughly twenty-eight trillion kilometers—just short of three light-years—behind the speeding starwhisp *Field Circus* is seething with change. There have been more technological advances in the past ten years than in the entire previous expanse of human history—and more unforeseen accidents.

Lots of hard problems are now basically tractable. The planetary genome and proteome have been mapped so exhaustively that the biosciences are now focusing on the challenge of the phenome: plotting the phase-space defined by the intersection of genes and biochemical structures, understanding how extended phenotypic traits are generated and contribute to evolutionary fitness. The biosphere has become surreal: small dragons have been sighted nesting in the Scottish highlands, and in the American mid-west, raccoons have been caught programming microwave ovens.

The computing power of the solar system is now around one thousand MIPS per gram, and is unlikely to increase in the near term—all but a frac-

tion of 1 percent of the dumb matter is still locked up below the accessible planetary crusts, and the sapience/mass ratio has hit a glass ceiling that will only be broken when people, corporations, or other posthumans get around to dismantling the larger planets. Amber was in at the start, in Jupiter orbit where the delta-vee is low and the pickings rich and massive, but now it's spreading to the asteroid belt: Greenpeace have sent squatters to occupy Eros and Juno, but the average planetoid is now surrounded by a reef of specialized nanomachinery and debris, victims of a cosmic land-grab unmatched since the days of the Wild West. The best brains flourish in free fall, minds surrounded by a sapient ether of extensions that out-think their meaty cortices by many orders of magnitude—minds like Amber, queen of the Inner Ring Imperium, the first politically autonomous self-extending power center in Jupiter orbit.

Down at the bottom of the terrestrial gravity well, there has been a major economic catastrophe: cheap immortagens, out-of-control personality adjuvants, and a new formal theory of uncertainty have knocked the bottom out of the insurance and underwriting industries. Gambling on a continuation of the worst aspects of the human condition—disease, senescence, and death—looks like a good way to lose money, and a deflationary spiral lasting almost fifty hours has taken down huge swathes of the global stock market. Genius, good looks, and long life are now considered basic human rights in the developed world: even the poorest backwaters are feeling knock-on effects from the commoditization of intelligence.

Not everything is sweetness and light in the era of mature nanotechnology. Widespread intelligence amplification doesn't lead to widespread rational behavior. New religions and mystery cults explode across the planet; much of the net is unusable, flattened by successive semiotic jihads. India and Pakistan have held their long-awaited nuclear war: external intervention by US and EU nanosats prevented most of the IRBMs from getting through, but the subsequent spate of network raids and Basilisk attacks cause havoc. Luckily, the infowar turns out to be more survivable than the energy war—especially once it is discovered that a simple anti-aliasing filter stops nine out of ten neural-wetware-crashing Langford fractals from causing anything worse than a mild headache.

New discoveries this decade include confirmation of quintessence theory—a mysterious weakly repulsive force responsible for changes in the rate of expansion of the universe after the wake of the big bang—and experimental proofs suggesting that quantum entanglement circuits may be used to implement a Turing Oracle: a device that can determine whether a given functional expression can be evaluated in finite time. It's Boom Time in the field of Extreme Cosmology, where some of the more recherché researchers are bickering over the possibility that the entire universe was created as a computing device, with a program encoded in the small print of the Planck constant.

Most people have forgotten about the extra-terrestrial transmission received fifteen years earlier. Many of those who haven't are passengers or spectators of the *Field Circus*: a light-sail craft that is speeding out of Sol system on a laser beam generated by Amber's installations in low Jupiter orbit. (Superconducting tethers anchored to Amalthea drag through Jupiter's magnetosphere, providing gigawatts of electricity for the hungry lasers: energy that comes in turn from the small moon's orbital momentum.) Manufactured by Airbus-Cisco years earlier, the *Field Circus* is a hick

backwater, isolated from the mainstream of human culture, its systems complexity limited by mass: the destination lies nearly three light years from Earth, and even with high acceleration and relativistic cruise speeds, the one kilogram starwhisp and its hundred-kilogram light-sail will take the best part of seven years to get there. By the time its occupants beam themselves home again, a linear extrapolation shows that as much change will have overtaken human civilization as in the preceding fifty millennia—the sum total of *H. sapiens sapiens'* time on Earth.

But that's okay by Amber. Because what she expects to find in orbit around the brown dwarf Hyundai +4904/-56 will be worth the wait.

Pierre is at work in a virtual machine, currently running the master control-system of the *Field Circus*; he's supervising the sail-maintenance bots when the message comes in. Two visitors are on their way up from Earth. The only other person around is Su Ang, who showed up some time after he arrived; she's busy with some work of her own. The master control VM—like all the other human-accessible environments at this level of the ship's virtualization stack—is a construct modeled on a famous movie; this one resembles the bridge of a long-since sunken ocean liner, albeit with discreetly informative user-interfaces hovering in front of the ocean view outside the windows. Polished brass gleams softly everywhere. "What was that?" he calls out, responding to the soft chime of a bell.

"We have visitors," Ang repeats, interrupting her rhythmic chewing. (She's trying out a betel-nut kick, but she's magicked the tooth-staining dye away and will probably detox herself in a few hours.) "They're buffering up the line already; just asking receipt is sucking most of our downstream bandwidth."

"Any idea who they are?" asks Pierre; he puts his boots up on the back of the vacant helmsman's chair and stares moodily at the endless expanse of green-gray ocean ahead.

Ang chews a bit more, watching him with an expression he can't interpret. "They're still locked," she says eventually, "but there was a flash from the Franklins, back home. One of them's some kind of lawyer, while the other's a film producer."

"A film producer?"

"The Franklin trust says it's to help defray our lawsuit expenses. Myanmar is gaining. They've already subpoenaed Amber's downline instance and they're trying to bring this up in some kind of kangaroo jurisdiction—Oregon Christian Reconstructionist Empire, I think."

"Ouch." Pierre winces. The daily news from Earth, modulated onto a lower-powered short-wavelength communication laser, is increasingly bad, giving him reason to be grateful he defected to Amber's jurisdiction years ago. She's incredibly rich: the goodwill futures leveraged off her dad's trust metric means people will bend over backward to do things for her. And she owns a lot of real estate, too; a hundred gigatons of rock in low Jupiter orbit with enough KE to power Northern Europe for a century. But her interstellar venture burns through money—both the traditional barter-indirection type and the more creative modern varieties—about the way you would if you heaped up the green pieces of paper and shoveled them onto a conveyor belt leading to the business end of a running Ariane-5 rocket motor. Just holding off the environmental protests over de-orbiting a small moon into Jupiter is a grinding job. Moreover, a whole bunch of national governments

have woken up and are trying to legislate themselves a slice of the cake. Nobody's tried to forcibly take over yet—there are two hundred gigawatts of lasers anchored to the Ring Imperium, and Amber takes her sovereign status seriously, has even applied for a seat at the UN and membership of the EU, with support from the Franklin borganism and her father's legal machinations—but the nuisance lawsuits are mounting up into a comprehensive denial-of-service attack. "Anything to say about it?"

"Mmph." Ang looks irritated for some reason. "Wait your turn; they'll be out of the buffer in another couple of days. Or more: the lawyer's got a huge infodump packaged on his person. Probably another semi-sapient class action lawsuit."

"I'll bet. They never learn, do they?"

"What, about the legal system here?"

"Yup." Pierre nods. "One of Amber's smarter ideas, reviving eleventh century Scots law and updating it with new options on barratry, raith-law, and compurgation." He pulls a face and detaches a couple of ghosts to go look out for the new arrivals: then he goes back to repairing sails. The interstellar medium is abrasive, full of dust—each grain of which carries the energy of a large bomb at this speed —and the laser sail is in a constant state of disintegration; a large chunk of the drive-system's mass is silvery utility flakes for patching and replacing the soap-bubble-thin membrane as it ablates away. The skill is in knowing how best to funnel repair resources to where they're needed, while minimizing tension in the suspension lines and avoiding resonance and thrust imbalance. As he trains the patch bots, he broods: about the hate mail from his elder brother (who still blames him for their father's accident) and about Sadeq's religious injunctions—*superstitious nonsense,* he thinks—and the fickleness of powerful women, and the endless depths of his own nineteen-year-old soul.

While he's brooding, Ang evidently finishes whatever she was doing and bangs out—not even bothering to use the polished mahogany door at the rear of the bridge, just discorporating and rematerializing somewhere else. Wondering if she's annoyed, he glances up just as the first of the ghosts patches into his memory map and he remembers what happened when he met the new arrival. His eyes widen: "Oh *shit!*"

It's not the film producer he's met; it's the lawyer who's just uploaded into the *Field Circus*'s virtual universe. Someone's going to have to tell Amber. And although the last thing he wants to do is talk to her, it looks like he's going to have to, because this means trouble.

Take a brain and put it in a bottle. Better: take a *map* of the brain and put it in a *map* of a bottle—or of a body—and feed signals to it that mimic its neurological inputs. Read its outputs and route them to a model body in a model universe with a model of physical laws, closing the loop: René Descartes would understand. That's the state of the passengers of the *Field Circus*; formerly physical humans, their neural software has been transparently migrated into a virtual machine environment executing on a honking great computer, where the universe they experience is merely a dream within a dream.

Brains in bottles—empowered ones, with total, dictatorial control over the reality they are exposed to—sometimes stop engaging in activities that brains in bodies can't avoid. Menstruation isn't mandatory; vomiting, angina, exhaustion, and cramp are all optional. So is meat-death, the decomposition

of the corpus. But some activities don't cease: because people—even people who have been converted into a software description, squirted through a high-bandwidth laser link, and ported into a virtualization stack—don't *want* them to stop. Breathing is wholly unnecessary, but suppression of the breathing reflex is disturbing unless you hack your hypothalamic map, and most homomorphic uploads don't want to do that. Then there's eating—not to avoid starvation, but for pleasure: feasts on sautéed dodo seasoned with silphium. It seems that the human addiction to sensory input won't go away. And that's without considering sex, and the technical innovations that become possible when the universe—and the bodies within it—are mutable.

The public audience with the new arrivals is held in yet another movie: the Parisian palace of Charles IX, the throne room lifted wholesale from *La Reine Margot* by Patrice Chéreau. Amber insisted on period authenticity, with the realism dialed right up to eleven; it's 1572 to the hilt this time, physical to the max. Pierre grunts in irritation, unaccustomed to his beard: his codpiece chafes and sidelong glances tell him he isn't the only member of the royal court who's uncomfortable. Still, Amber is resplendent in a gown worn by Isabelle Adjani as Marguerite de Valois, and the luminous sunlight streaming through the stained glass windows high above the crowd of actor zimboes lends a certain barbaric majesty to the occasion. The place is heaving with bodies in clerical robes, doublets, and low-cut gowns—some of them occupied by real people. Pierre sniffs again: someone (Gavin, with his history bug, perhaps?) has been working on getting the smell right. He hopes like hell that Catherine de Medici isn't going to show up.

A bunch of actors portraying Huguenot soldiers approach the throne on which Amber is seated: they pace slowly forward, escorting a rather bemused-looking fellow with long, lank hair and a brocade jacket that appears to be made of cloth-of-gold. "His lordship, Attorney at Arms Alan Glashwiecz!" announces a flunky, reading from a parchment: "here at the behest of the most excellent guild and corporation of Smoot, Sedgwick Associates, with matters of legal import to discuss with Her Royal Highness!"

A flourish of trumpets. Pierre glances at Her Royal Highness. Who nods gracefully, but is slightly peaky—it's a humid summer day and her many-layered robes look very hot. "Welcome to the furthermost soil of the Ring Imperium," she announces in a clear, ringing voice: "I bid you welcome and invite you to place your petition before me in full public session of court."

Pierre directs his attention to Glashwiecz, who appears to be worried. Doubtless he'd absorbed the basics of court protocol in the Ring—population all of eighteen thousand back home, a growing little principality—but the reality of it, a genuine old-fashioned *monarchy* rooted in Amber's three-way nexus of power, data, and time, always takes a while to sink in. "I would be pleased to do so," he says, a little stiffly, "but in front of all those—"

Pierre misses the next bit, because someone has just goosed him on the left buttock. He starts and half-turns to see Su Ang looking past him at the throne, a lady in waiting for the queen. She wears an apricot dress with tight sleeves and a bodice that bares everything above her nipples: there's a fortune in pearls roped into her hair. As he notices her, she winks at him.

Pierre freezes the scene, decoupling them from reality, and she faces him. "Are we alone now?" she asks.

"You want to talk?" he counters, heat rising in his cheeks. The noise around them is a random susurrus of machine-generated crowd scenery, the

people motionless as their shared reality thread proceeds independently of the rest of the universe.

"Of course!" She smiles at him and shrugs. The effect on her chest is remarkable—those period bodices could give a skeleton a cleavage—and she winks at him again. "Oh Pierre." She smiles. "So easily distracted!" She snaps her fingers and her clothing cycles through Afghani burqua, nudity, trouser suit, then back to court finery: her grin is the only constant. "Now that I've got your attention . . . stop looking at me; look at *him*."

Even more embarrassed, Pierre follows her outstretched arm all the way to the momentarily frozen Moorish emissary. "Sadeq?"

"Sadeq *knows* him, Pierre. This guy, there's something wrong."

"Shit. You think I don't know that?" Pierre looks at her with annoyance, embarrassment forgotten. "I've seen him before. Been tracking his involvement for years. Guy's a front for the Queen Mother. Her divorce lawyer when she went after Amber's dad."

"I'm sorry." Ang glances away. "You haven't been yourself lately, Pierre. I know it's something wrong between you and her. I was worried. You're not paying attention to the little details."

"Who do you think warned Amber?" he asks.

"Oh. Okay, so you're in the loop," she says. "I wasn't sure. You've been distracted. Is there anything I can do to help?"

"Listen." Pierre puts his hands on her bare shoulders nervously: she doesn't move, but looks up into his eyes—Su Ang is only one-sixty tall—and he feels a pang of something odd: teenage male uncertainty about the friendship of women. *What does she want?* "I know, and I'm sorry, and I'll try to keep my eyes on the ball some more, but I've been in my own headspace a lot lately. We ought to go back into the audience before anybody notices."

"Do you want to talk about the problem first?" she asks, inviting his confidence.

"I—" Pierre shakes his head. *I could tell her everything,* he realizes shakily as his meta-conscience prods him urgently. He's got a couple of agony aunt agents, but Ang is a real person and a friend; she won't pass judgment and her model of human eusocial is a hell of a lot better than any expert system's. But time is in danger of slipping, and besides, Pierre feels dirty. "Not now," he says. "Let's go back."

"Okay." She nods, then turns away, steps behind him with a swish of skirts, and he unfreezes time again as they snap back into place within the larger universe, just in time to see the respected visitor serve the queen with a class action lawsuit, and the queen respond by referring adjudication to raith-law.

Hyundai +4904/-56 is a brown dwarf; a lump of dirty hydrogen condensed from a stellar nursery, eight times as massive as Jupiter but not massive enough to ignite a fusion reaction at its core. The relentless crush of gravity has overcome the mutual repulsion of electrons trapped at its core, shrinking it into a shell of slush around a sphere of degenerate matter; it's barely larger than Jupiter, but much denser. Gigayears ago, a chance stellar near-miss sent it careening off into the galaxy on its own, condemned to drift in eternal darkness along with the cluster of frozen moons that dance attendance upon it.

By the time the *Field Circus* is decelerating toward it at short range—having shed the primary sail, which drifts further out into interstellar space

while reflecting light back onto the braking sail to slow the starwhisp—Hyundai +4904/-56 is just under one parsec distant from Earth, closer even than Proxima Centauri. Utterly dark at visible wavelengths, the brown dwarf could have drifted through the outer reaches of the solar system before conventional telescopes would have found it by direct observation: only an infrared survey in the early years of the new century gave it a name.

A bunch of passengers and crew have gathered on the bridge—now running at one tenth of realtime—to watch the arrival. Amber sits curled up in the captain's chair, moodily watching the gathered avatars. Pierre is still avoiding her at every opportunity—formal audiences excepted—and the damned shark and his pet hydra aren't invited, but apart from that, most of the gang's here. There are sixty-three uploads running on the *Field Circus*'s virtualization stack, software copied out of meatbodies mostly still walking around back home: it's a crowd, but it's possible to feel lonely in a crowd, even when it's *your* party. And especially when you're worried about debt, even when you're a billionairess, beneficiary of the world's biggest reputations rating trust fund. Amber's clothing—black leggings, black sweater—is as dark as her mood.

"Something troubles you." A hand descends on the back of the chair next to her.

She glances round momentarily, nods in recognition: "Yeah. Have a seat. You missed the audience?"

The thin, brown-skinned man with a neatly cropped beard and deeply lined forehead slips into the seat next to her. "It was not part of my religious heritage," he explains carefully, "although the situation is not unfamiliar." A momentary smile threatens to crack his stony face. "The casting was a trifle disturbing."

"I'm no Margot de Valois, but the vacant role . . . let's just say, the cap fits." Amber leans back in her chair. "Mind you, Margot had an *interesting* life," she muses.

"Don't you mean depraved and debauched?" her neighbor counters.

"Sadeq." She closes her eyes. "Let's not pick a fight over absolute morality just right now, please? We have an orbital insertion to carry out, then an artifact to locate, and a dialogue to open, and I'm feeling very tired. Drained."

"Ah—I apologize." He inclines his head carefully. "Is it your young man's fault? Has he slighted you?"

"Not exactly—" Amber pauses. Sadeq, who she invited along as ship's theologian in case they run into any gods, has taken up her personal well-being as some kind of hobby; she finds it mildly oppressive at times, flattering at others, surreal always. Using the quantum search resources available to a citizen of the Ring Imperium, he's outpublished his peers, been elected a hojetolislam at an unprecedentedly young age: he'll probably make ayatollah in a couple more subjective years. He's circumspect in dealing with cultural differences, reasons with impeccable logic, carefully avoids antagonizing her—and constantly seeks to guide her moral development. "It's a personal misunderstanding," she says. "I'd rather not talk about it until we've sorted it out."

"Very well." He looks unsatisfied, but that's normal. Sadeq still has the dusty soil of a childhood in the industrial city of Yazd stuck to his boots: sometimes she wonders if their disagreements don't mirror in miniature the gap between the early twentieth and early twenty-first centuries. "But back to the here-and-now. Do you know where this router is?"

"I will in a few minutes or hours." Amber raises her voice, simultaneously spawning a number of search-ghosts: "Boris! You got any idea where we're going?"

Boris lumbers round in place to face her: today he's wearing a velociraptor, and they don't turn easily in confined spaces. He snarls irritably, "Give me some space!" He coughs, a threatening noise from the back of his wattled throat. "Searching the sail's memory now." The rear of the soap bubble-thin laser sail is saturated with tiny nanocomputers, spaced micrometers apart: equipped with light receptors and configured as cellular automata, they form a gigantic phased-array detector, a retina over a hundred meters in diameter. Boris is feeding them patterns, patterns describing anything that differs from the unchanging starscape. Soon the memories will condense, visions of darkness in motion—the cold, dead attendants of an aborted sun.

"But where is it going to be?" asks Sadeq. "Do you know what you are looking for?"

"Yes; we'll have no trouble finding it," says Amber. "It looks like this." She flicks an index finger at the row of glass windows that front the bridge: her signet ring flashes ruby light, and something indescribably weird shimmers into view in place of the seascape. Clusters of pearly beads that form helical chains, disks and whorls of color that interlace and knot through one another, hang in space above a darkling planet. "Looks like a William Latham sculpture made out of strange matter, doesn't it?"

"Very abstract," Sadeq says approvingly.

"It's *alive*," she adds. "And when it gets close enough to see us, it'll try to eat us."

"What?" Sadeq sits up uneasily.

"You mean nobody told you?" asks Amber. "I thought we'd briefed everybody." She throws a glistening golden pomegranate at him, and he catches it: the apple of knowledge dissolves in his hand, and he sits in a haze of ghosts absorbing information on his behalf. "Damn," she adds mildly.

Sadeq freezes in place: glyphs of crumbling stonework overgrown with ivy texture his skin and his dark suit, warning that he's busy in another private universe.

"*Hrrrr!* Boss! Found something," calls Boris, drooling on the bridge floor.

Amber glances up. *Please, let it be the router,* she thinks. "Put it on the main screen."

"Are you sure this is safe?" interjects Su Ang.

"*Nothing* is safe," Boris snaps, clattering his huge claws on the deck. "Here. Look."

The view beyond the windows flips to a perspective on a dusty bluish horizon; swirls of hydrogen brushed with a high cirrus of white methane crystals, stirred above the freezing point of oxygen by Hyundai +4904/-56's residual rotation. The image-intensification level is huge—a naked human eyeball would see nothing but blackness here. Rising above the limb of the gigantic planet is a small pale disk: Callidice, largest moon of the brown dwarf—or second-innermost planet—a barren rock slightly larger than Mercury. The screen zooms in on Callidice, surging across a landscape battered by craters and dusted with the spume of ice volcanoes; and finally, just above the far horizon, something turquoise shimmers and spins against a backdrop of frigid darkness.

"That's it," Amber whispers, her stomach turning to jelly as all the terri-

ble might-have-beens dissolve like phantoms of the night around her. "That's *it*." Elated, she stands up, wanting to share the moment with everybody she values. "Wake up, Sadeq! Someone get that damned cat in here! Where's Pierre? He's got to see this!"

Night and revelry rule outside the castle: the crowds are drunken and rowdy on the eve of the St. Bartholomew's Day massacre. Fireworks burst overhead, and the open windows admit a warm breeze redolent of cooked meats, woodsmoke, open sewers. Meanwhile, a lover steals up a tightly spiraling stone staircase in the near-dark; his goal, a pre-arranged rendezvous. He's been drinking, and his best linen shirt shows the stains of sweat and food. He pauses at the third window to breathe in the outside air and run both hands through his mane of hair, which is long, unkempt, and grimy. *Why am I doing this?* he wonders. This is so unlike him, this messing around—

He carries on up the spiral. At the top, an oak door gapes on a vestibule lit by a lantern hanging from a hook. He ventures inside into a reception room paneled in oak blackened by age. Crossing the threshold makes another crossover kick in by prior arrangement. Something other than his own volition steers his feet, and he feels an unfamiliar throb in his chest, anticipation, and a warmth and looseness lower down that makes him cry out: "Where are you?"

"Over here." He sees her waiting for him in the doorway. She's partially undressed, wearing layered under-skirts and a flat-chested corset that makes the tops of her breasts swell like lustrous domes: her tight sleeves are half unraveled, her hair disheveled. He's full of her brilliant eyes, the constriction holding her spine straight, the taste in her mouth: she's the magnet for his reality, impossibly alluring, so tense she could burst. "Is it working for you?" she asks.

"Yes." He feels tight, breathless, squeezed between impossibility and desire as he walks toward her. They've experimented with gender play, trying on the extreme dimorphism of this period as a game, but this is the first time they've done it this way. She opens her mouth: he kisses her, feels the warmth of his tongue thrust between her lips, the strength of his arms enclosing her waist.

She leans against him, feeling his erection. "So this is how it feels to be you!" she says wonderingly. The door to her chamber is ajar, but she doesn't have the self-restraint to wait: the flood of new sensations—rerouted from her physiology model to his proprioceptive sensorium—has taken hold. She grinds her hips against him, pushing deeper into his arms, whining softly at the back of her throat as she feels the fullness in his balls, the tension of his penis. He nearly faints with the rich sensations of her body—it's as if he's dissolving, feeling the throbbing hardness against his groin, turning to water and running away. Somehow he gets his arms around her waist—so tight, so breathless—and stumbles forward into the bedroom. She's whimpering as he drops her on the over-stuffed mattress: "*do* it to me!" she demands, "do it now!"

Somehow he ends up on top of her, leggings down around his ankles, skirts bundled up around her waist; she kisses him, grinding her hips against him and murmuring urgent nothings. Then his heart is in his mouth and there's a sensation like the universe pushing into his private parts, so inside-out it takes his breath away: it's hot and as hard as rock and

he wants it inside so badly, but at the same time it's an intrusion, frightening and unexpected. He feels the lightning touch of his tongue on her nipples as he leans closer, feels exposed and terrified and ecstatic as her private places take in his member: as he begins to dissolve into the universe he screams in the privacy of his own head, *I didn't know it felt like this*—

Afterward, she turns to him with a lazy smile and asks, "How was it for you?" Obviously assuming that if she enjoyed it, he must have, too.

But all he can think of is the sensation of the universe thrusting into him, and of how *good* it felt. All he can hear is his father yelling ("what are you, some kind of *queer*?")—and he feels dirty.

Greetings from the last megasecond before the discontinuity.

The solar system is thinking furiously at 10^{33} MIPS—thoughts bubble and swirl in the equivalent of a million billion unaugmented human minds. Saturn's rings glow with waste heat: the remaining faithful of the Latter-Day Saints are correlating the phase-space of their genome and the records of their descent in an attempt to resurrect their ancestors. Several skyhooks have unfurled in equatorial orbit around the earth like the graceful fern-like leaves of sundews, ferrying cargo and passengers to and from orbit. Small, crab-like robots swarm the surface of Mercury, exuding a black slime of photovoltaic converters and the silvery threads of mass drivers: a glowing cloud of industrial nanomes forms a haze around the planet as it slowly shrinks under the onslaught of copious solar power and determined mining robots.

The original incarnations of Amber and her court float in high orbit above Jupiter, presiding over the huge nexus of dumb matter trade that is rapidly biting into the available mass of the inner Jovian system. The trade in reaction mass is brisk; and there are shipments of diamond/vacuum biphase structures to assemble and crank down into the lower reaches of the solar system. Far below, skimming the edges of Jupiter's turbulent cloudscape, a gigantic glowing figure-of-eight—five-hundred-kilometer-long loops of superconducting cable—traces incandescent loops through the gas giant's magnetosphere: trading momentum for electrical current, diverting it into a fly's eye grid of lasers that beam it toward Hyundai +4904/-56. As long as the original Amber and her incarnate team can keep it running, the *Field Circus* can continue its mission of discovery. But they're part of the posthuman civilization evolving down in the turbulent depths of Sol system; part of the runaway train being dragged behind the out-of-control engine of history.

Weird new biologies based on complex adaptive matter take shape in the sterile oceans of Titan; in the frigid depths beyond Pluto, supercooled boson gasses condense into impossible dreaming structures, packaged for shipping inward to the fast-thinking core.

There are still humans down there, in the hot depths: but it's getting hard to recognize them. The lot of humanity before the twenty-first century was nasty, brutish, and short: chronic malnutrition, lack of education, and endemic diseases led to crippled minds and broken bodies. Now, most people multitask: their meatbrains at the core of a haze of personality, much of it virtualized on stacked layers of structured reality far from their physical bodies. Wars and revolutions, or their subtle latter-day cognates, sweep the globe as constants become variables: many people find the death of stupidity even harder to accept than the end of mortality. Some have vitrified

themselves to await an uncertain posthuman future: others have modified their core identities to better cope with the changed demands of reality. Among these are beings who nobody from a previous century would recognize as human: human/corporation half-breeds, zombie clades dehumanized by their own optimizations, angels and devils of software, slyly self-aware financial instruments. Even their popular fictions are marginally sentient.

None of this, other than the barest news summary, reaches the *Field Circus*: the starwhisp is a fossil, left behind by the broad sweep of accelerating progress. And so it is aboard the *Field Circus* that the most stupid events remaining in humanity's future light-cone take place.

"Say hello to the jellyfish, Boris."

Boris, in human drag, for once, glares at Pierre and grips the pitcher with both hands. The contents of the jug swirl their tentacles lazily: one flips almost out of solution, dislodging an impaled cocktail cherry. "Will get you for this," Boris threatens: the smoky air around his head is aswirl with demoniac visions of vengeance.

Su Ang stares intently at Pierre, who is watching Boris as he raises the jug to his lips and begins to drink. The baby jellyfish—small, pale blue, with cuboid bells and four clusters of tentacles trailing from each corner—slip down easily. Boris winces momentarily as the nematocysts let rip inside his mouth, but in a moment or so the cubozoan slips down, and, in the meantime, his biophysics model clips the extent of the damage to his stinger-ruptured oropharynx.

"Wow," he says, taking another slurp of sea-wasp margaritas. "Don't try this at home, meat puppets."

"Here." Pierre reaches out. "Can I?"

"Invent your own damn poison," Boris sneers—but he releases the jug and passes it to Pierre, who raises it and drinks. The cubozoan flesh reminds him of fruit jelly drinks in a hot Hong Kong summer; the stinging in his palate is sharp but fades rapidly, producing an intimate burn when the alcohol hits the mild welts that are all this universe will permit the lethal medusa to inflict on him.

"Not bad," says Pierre, wiping a stray loop of tentacle off his chin. He pushes the pitcher across the table toward Su Ang. "What's with the wicker man?" He points a thumb over his back at the table jammed in the corner opposite the copper-topped bar.

"Who cares?" asks Boris. " 'S part of the scenery, isn't it?"

The bar is a three-hundred-year-old brown café with a beer menu that runs to sixteen pages and wooden walls stained the color of stale ale. The air is thick with the smells of tobacco, brewer's yeast, and melatonin spray—and none of it exists. Amber dragged it out of the Franklin Borg's collective memories, by way of her father's scattershot emails annotating her corporeal origins—the original is in Amsterdam, if that city still exists.

"*I* care who it is," says Pierre.

"Save it," Ang says quietly. "I think it's the lawyer. A privacy screen."

Pierre glances over his shoulder and glares. "Really?"

Ang puts a restraining hand on his wrist. "Really. Don't pay it any attention. You don't have to, until the trial, you know."

The wicker man sits uneasily in the corner: a basket-weave silhouette made from dried reeds, dressed in a red kerchief. A glass of doppelbock fills the mess of tied-off ends where its right hand ought to be: from time to time

it raises the glass as if to take a mouthful, and the beer vanishes into the singular interior.

"Fuck the trial," Pierre says shortly. *And fuck Amber, too, for naming me her public defender—*

"Since when do lawsuits come with an invisible man?" asks Donna the Journalist, blitting into the bar along with a patchy historical trail hinting that she's just come from the back room.

"Since—" Pierre blinks. "Hell." When Donna entered, so did Aineko: or maybe the cat's been here all the time, curled up loaf-of-bread fashion on the table in front of the wicker man. "You're damaging the continuity," Pierre complains. "This universe is broken."

"Fix it yourself," Boris suggests. "Everybody else is coping." He snaps his fingers. "Waiter!"

"Excuse me." Donna shakes her head. "I didn't mean to harm anything."

Ang, as always, is more accommodating. "How are you?" she asks. "Would you like to try this most excellent poison cocktail?"

"I am well," says Donna. A heavily built German woman—blond and solidly muscular, according to the avatar she's presenting to the public—she's surrounded by a haze of viewpoints: camera angles on her society of mind, busy integrating, splicing her viewpoint threads together in an endless journal of the journey. A stringer for the CIA media consortium, she uploaded to the ship in the same packet as the lawsuit. "*Danke,* Ang."

"Are you recording right now?" asks Boris.

Donna sniffs. "When am I *not?*" A momentary smile. "I am only a scanner, no? Five hours, until arrival, to go. I may stop after then." Pierre glances across the table at Su Ang's hands: her knuckles are white and tense. "I am to avoid missing anything if possible," Donna continues, oblivious to Ang's disquiet. "There are eight of me at present! All recording away."

"That's all?" Ang asks, raising an eyebrow.

"Yes, that is all, and I have a job to do! Don't tell me you do not enjoy what it is that you do here?"

"Right." Pierre glances in the corner again, avoiding eye contact with the hearty Girl Friday wannabe. He has a feeling that if there were any hills hereabouts to animate she'd be belting out the music. "Amber told you about the privacy code here?"

"There is a privacy code?" asks Donna, swinging at least three subjective ghosts to bear on him for some reason—evidently he's hit an issue she has mixed feelings about.

"A privacy code," Pierre confirms. "No recording in private, no recording where people withhold permission in public, and no sandboxes and cut-ups."

Donna laughs disbelievingly: "I would never do such a thing! Trapping a copy of someone in a virtual space to record their responses would be assault under Ring legal code, not true?"

"Your mother," Boris says snidely, brandishing a fresh jug of iced killer jellyfish in her direction.

"As long as we all agree," Ang interrupts, searching for agreement. "It's all going to be settled soon, isn't it?"

"Except for the lawsuit," mutters Pierre, glancing at the corner again.

"I don't see the problem," says Donna. "That's just between Amber and her downlink adversaries!"

"Oh, it's a problem all right," says Boris, his tone light. "What are your options worth?"

"My—" Donna shakes her head. "I'm not vested."

"Plausible." Boris doesn't crack a smile. "Even so, when we go home, your credibility metric will bulge. Assuming people still use distributed trust markets to evaluate the stability of their business partners."

Not vested. Pierre turns it over in his mind, slightly surprised. He'd assumed that everybody aboard the ship—except, perhaps, the lawyer, Glashwiecz—was a fully vested member of the expeditionary company.

"I am not vested," Donna insists. "I'm listed independently." For a moment an almost-smile tugs at her face, a charmingly reticent expression that has nothing to do with her bluff exterior. "Like the cat."

"The—" Pierre turns round in a hurry. Yes, Aineko appears to be sitting silently at the table with the wicker man; but who knows what's going through that furry head right now? *I'll have to bring this up with Amber,* he realizes uneasily. *I* ought *to bring this up with Amber* . . . "but your reputation won't suffer for being on this craft, will it?" he asks aloud.

"I will be all right," Donna declares. The waiter comes over. "Mine will be a bottle of schneideweisse," she says. And then, without breaking step, "Do you believe in the singularity?"

"Am I a singularitarian, do you mean?" asks Pierre, a fixed grin coming to his face.

"Oh, no, no, no!" Donna waves him down, grins broadly, nods at Su Ang: "I do not mean it like that! Attend: what I meant to ask was whether you in the concept of a singularity believe, and if so, where it is?"

"Is this intended for a public interview?" asks Ang.

"Well, I cannot into a simulation drag you off and expose you to an imitative reality excursion, can I?" Donna leans back as the bartender places a ceramic stein in front of her.

"Oh. Well." Ang glances warningly at Pierre and dispatches a very private memo to scroll across his vision: *don't play with her; this is serious.* Boris is watching Ang with an expression of hopeless longing; Pierre tries to ignore it all, taking the journalist's question seriously. "The singularity is a bit like that old-time American Christian rapture nonsense, isn't it?" he says. "When we all go a-flying up to heaven, leaving our bodies behind?" He snorts, reaches into thin air and gratuitously violates causality by summoning a jug of ice-cold sangria into existence: "The rapture of the nerds. I'll drink to that."

"But when did it take place?" asks Donna. "My audience, they will to know your opinion be needing."

"Four years ago, when we instantiated this ship," Pierre says promptly.

"Back in twenty-sixteen," says Ang. "When Amber's father liberated the uploaded lobsters."

"Is not happening *yet,*" contributes Boris. "Singularity implies infinite rate of change achieved momentarily. Future not amenable thereafter to prediction by pre-singularity beings, right? So has not happened."

"Au contraire: it happened on June sixth, nineteen sixty-nine, at eleven hundred hours, eastern seaboard time," Pierre counters. "That was when the first network control-protocol packets were sent from the data port of one IMP to another—the first ever internet connection. *That's* the singularity. Since then we've all been living in a universe that is impossible to predict from events prior to that time."

"That's rubbish," counters Boris. "Singularity is load of religious junk. Christian mystic rapture recycled for atheist nerds."

"Not so." Su Ang glances at him, hurt. "Here we are, sixty-something human minds. We've been migrated—while still awake—right out of our own heads using an amazing combination of nanotechnology and electron spin-resonance mapping, and we're now running as software in an operating system designed to virtualize multiple physics models and provide a simulation of reality that doesn't let us go mad from sensory deprivation! *And* this whole package is about the size of a fingertip, crammed into a starship the size of your grandmother's old walkman, in orbit around a brown dwarf just over three light years from home, on its way to plug into a network router created by incredibly ancient alien species, and you can tell *me* that the idea of a fundamental change in the human condition is nonsense?"

"Mmph." Boris looks perplexed. "Would not put it that way. The *singularity* is nonsense, not uploading or—"

"Yah, right." Ang smiles at Boris and he wilts.

Donna nods enthusiastically, beaming at them. "Fascinating!" she enthuses. "Tell me, what are these lobsters you think are important?"

"They're Amber's friends," Ang explains. "Years ago, Amber's father, Manfred, did a deal with them. They were the first uploads, you know? Hybridized spiny lobster neural tissue and a heuristic API and some random mess of backward-chaining expert systems. They got out of their lab and into the net, and he brokered a deal to set them free, in return for their help running a Franklin corp orbital factory. Way back in the early days before they figured out how to do self-assembly properly. Anyway, the lobsters insisted—part of their contract—that Bob Franklin pay to have the deep-space tracking network beam them out into interstellar space. They wanted to emigrate, and, looking at what's happened to the solar system since then, who can blame them?"

Pierre takes a big mouthful of sangria. "The cat," he says.

"The cat—" Donna's head swivels round, but Aineko has banged out again, retroactively editing her presence out of the event-history of this public space. "What *about* the cat?"

"The *family* cat," explains Ang. She reaches over for Boris's pitcher of jellyfish juice, but frowns as she does so. "Aineko wasn't conscious back then, but later . . . when SETI@home finally received that message back, oh, however many years ago, Aineko remembered the lobsters. And cracked it wide open while all the distributed CETI teams were still thinking in terms of Von Neumann architectures and concept-oriented programming: it's a semantic net designed to mesh perfectly with the lobster broadcast all those years ago, and provide a high-level interface to a communications network we're going to visit." She squeezes Boris's fingertips. "SETI@home logged these coordinates as the origin of the transmission, and Amber decided to come visiting. Hence, this expedition. Aineko created a virtual lobster and interrogated the ET packet, hence the communications channel we're about to open."

"Ah, is all a bit clearer," says Donna. "But the lawsuit—" she glances at the hollow wicker man in the corner.

"Well, here we have a problem," says Ang.

"No," says Pierre. "*I* have a problem. And it's all Amber's fault."

"Hmm?" Donna stares at him. "Why blame the queen?"

"Because she's the one who picked the lunar month to be the reporting time period for companies in her domain, and specified raith-law for resolving corporate conflicts," he grumbles. "*Compurgation,* in this day and age! And she appointed me her champion." *In the most traditional way imagin-*

able, he remembers with a warm frisson of longing. He'd been hers in body and soul, before that disastrous experiment. He isn't sure whether it still applies, but— "I've got to take on this lawsuit on her behalf, in adversarial stance."

He glances over his shoulder: the wicker man sits there placidly, pouring beer down its invisible throat like a tired farm laborer.

"Trial by combat," Su Ang explains to Donna's perplexed ghost-swarm, which is crawling all over the new concept in a haze of confusion. "Not physical combat, but a conflict of interest. It seemed like a good idea at the time, to keep junk litigants out of the Ring Imperium; but the queen mother is *very* persistent. Probably because if she wins, she gets to own everything. And I mean *everything*."

Ten million kilometers out, Hyundai +4904/-56 looms beyond the parachute-shaped sail of the *Field Circus* like a rind of darkness bitten out of the edge of the universe. Heat from the gravitational contraction of its core keeps it warm, radiating at six hundred degrees absolute, but the paltry emission does nothing to break the eternal ice that grips Callidice, Iambe, Celeus, and Metaneira—stillborn planets locked in orbit around the brown dwarf. However, planets aren't the only structures that orbit the massive sphere of hydrogen. Close in, skimming the cloud-tops by only twenty thousand kilometers, Boris's phased-array eye has blinked at something metallic and hot. Whatever it is, it orbits out of the ecliptic plane traced by the icy moons, and in the wrong direction. Further out, a speckle of reflected emerald laser light picks out a gaudy gem against the starscape: their destination, the router.

"That's it," says Boris. His body shimmers into humanity, retconning the pocket universe of the bridge into agreeing that he's been present in primate form all along. Amber glances sideways: Sadeq is still wrapped in ivy, his skin the texture of weathered limestone. "Closest approach is sixty-three light seconds, due in eight hundred thousand; can give you closer contact if we maneuver, but will take time to achieve a stable orbit."

Amber nods thoughtfully, sending copies of herself out to work the mechanics. The big light-sail is unwieldy, but can take advantage of two power sources: the original laser beam from Jupiter, and its reflection bouncing off the now-distant primary light-sail. The temptation is to rely on the laser for constant acceleration, to just motor on in and squat on the router's cosmic doorstep, except for the risk of beam interruption. It's happened before, for seconds to minutes at a time, about six times on the voyage so far. She's not sure what causes it (Pierre has a theory about Oort Cloud objects occulting the beam) but the implications of losing power while maneuvering deep in a gravity well are much more serious than a transient loss of thrust in free interstellar flight. "Let's just keep it fail-safe," she says. "We'll go for a straight orbital insertion and steady cranking. I don't want us on a free-flight trajectory that entails lithobraking if we can't get the sail back."

"Very prudent," Boris agrees. "Marta, work on it." A buzzing presence of not-insects indicates that the heteromorphic helmswoman is on the job. "I think we should be able to take our first close-in look in about two million seconds, but if you want I can ping it now. . . ?"

"No need for protocol analysis," Amber says casually. "Where's—ah, there you are." She reaches down and picks up Aineko, who twists round sinuously and licks her arm with a tongue like sandpaper. "What do *you* think?"

"Do you want fries with that?" asks the cat, focusing on the artifact at the center of the main screen in front of the bridge.

"No, I just want a conversation," says Amber.

"Well, okay." The cat dims, moves jerkily, sucking up local processing power so fast that it disturbs the local physics model. "Opening port now."

A subjective minute or two passes. "Where's Pierre?" Amber asks herself quietly. Some of the maintenance metrics she can read from her privileged viewpoint are worrying: the *Field Circus* is running at almost eighty percent of utilization. Whatever processing Aineko is doing in order to establish the interface to the router, it's taking up an awful lot of capacity. "And where's the bloody lawyer?" she adds, almost as an afterthought.

The *Field Circus* is small, but its light sail is highly controllable. Aineko takes over a cluster of cells in its surface, turning them from straight reflectors into phase-conjugate mirrors; a small laser on the ship's hull begins to flicker thousands of times a second, and the beam bounces off the modified segment of mirror, focusing to a coherent point right in front of the distant blue dot of the router. Aineko ramps up the modulation frequency, adds a bundle of channels using different wavelengths, starts feeding out a complex set of pre-planned signals that provide an encoding format for high-level data.

"Leave the lawyer to me." She starts, glances sideways to see Sadeq watching her. He smiles without showing his teeth. "Lawyers do not mix with diplomacy," he explains.

"Huh." Ahead of them, the router is expanding. Strings of nacreous spheres curl in strange loops around a hidden core, expanding and turning inside-out in systolic pulses that spawn waves of recomplication through the structure. A loose red speckle of laser light stains one arm of beads: suddenly it flares up brilliantly, reflecting data back at the ship. "Ah!"

"Contact," purrs the cat. Amber's fingertips turn white where she grips the arms of her chair.

"What does it say?" she asks, quietly.

"What do *they* say," corrects Aineko. "It's a trade delegation and they're uploading right now. I can use that negotiation network they sent us to give them an interface to our systems if you want."

"Wait!" Amber half-stands in sudden nervousness. "Don't give them free access! What are you thinking of? Stick them in the throne room and we'll give them a formal audience in a couple of hours." She pauses. "That network layer they sent through. Can you make it accessible to us, use it to give us a translation layer into their grammar-mapping system?"

The cat looks round, thumps her tail irritably. "You'd do better loading the network yourself—"

"I don't want *anybody* on this ship running alien code before we've vetted it thoroughly!" she says urgently. "In fact, I want them bottled up in the Louvre grounds, just as thoroughly as we can, and I want them to come to us through our own linguistic bottleneck. Got that?"

"Clear," Aineko grumbles.

"A trade delegation," Amber thinks aloud. "What would Dad make of *that?*"

One moment, he's in the bar, shooting the bull with Su Ang and Donna the journalist's ghost and a copy of Boris; the next, he's abruptly precipitated into a very different space.

Pierre's heart seems to tumble within his rib cage, but he forces himself to stay calm as he glances around the dim, oak-paneled chamber. This is wrong, so wrong that it signifies either a major systems crash or the application of frightening privilege levels to his realm. The only person aboard who's entitled to those privileges is—

"Pierre?"

She's behind him. He turns, angry. "Why did you drag me in here? Don't you know it's rude to—"

"Pierre."

He stops. Looks at Amber. He can't stay angry at her for long, not to her face. She's not dumb enough to bat her eyelashes at him, but she's disarmingly cute for all that: yet something inside him feels shriveled and *wrong* in her presence. "What is it?" he says, curtly.

"I don't know why you've been avoiding me." She starts to take a step forward, then stops: bites her lip. *Don't do this to me!* he thinks. "You know it hurts?"

"Yes." That much of an admission hurts him, too. He can hear his father yelling over his shoulder, the time he found him with Laurent, elder brother: it's a choice between pére or Amber, but it's not a choice he wants to make. *The shame.* "I didn't—I have some issues."

"It was the other night?"

He nods. *Now* she takes a step forward. "We can talk about it, if you want. Whatever you want," she says. And she leans toward him and he feels his resistance crumbling: he reaches out and hugs her and she wraps her arms around him and leans her chin on his shoulder, and this doesn't feel wrong: how can anything this good be wrong?

"It made me uncomfortable," he mumbles into her hair. "Need to sort out myself."

"Oh, Pierre." She strokes the down at the back of his neck. "You should have said. We don't have to do it that way. If you don't want to."

How to tell her how hard it is to admit that anything's wrong? Ever?

"You didn't drag me here to tell me that," he says, implicitly changing the subject.

Amber lets go of him, backs away almost warily. "What is it?" she asks.

"Something's wrong?" he half-asks, half-asserts. "Have we made contact yet?"

"Yeah," she says. Pulls a face. "There's an alien trade delegation in the Louvre. That's the problem."

"An alien trade delegation." He rolls the words around the inside of his mouth, tasting them. They feel paradoxical, cold, slow, after the hot words of passion he's been trying to avoid uttering. His fault for changing the subject.

"A trade delegation," says Amber. "I should have anticipated. I mean, we were going to go through the router ourselves, weren't we?"

He sighs. "We thought we were going to do that." A quick prod at the universe's controls determines that he has certain capabilities: he invokes an armchair, sprawls across it. "A network of point-to-point wormholes linking routers, self-replicating communication hubs, in orbit around most of the brown dwarfs of the galaxy. Right? That's what we expected. Limited bandwidth, not a lot of use to a mature superintelligence that has converted the free mass of its birth solar system into computronium, but sufficient for conversations. Conversations carried out via a packet-switched network in real

time, not limited by the speed of light but bound together by a common reference frame and the latency between network hops."

"That's about the size of it," she agrees from the carved-ruby throne beside him. "Except that there's a trade delegation waiting for us. In fact, they're coming aboard already."

Pierre's brow wrinkles. "Doesn't make sense," he says, finally. "Doesn't make sense at all."

Amber nods. "I carry a ghost of Dad around. He's really upset about it."

"Listen to your old man." Pierre's lips quirk humorlessly. "We were going to jump through the looking glass, but it seems someone has beaten us to the punch. Question is why?"

"I don't like it." Amber reaches out sideways and he catches her hand. "And then there's the lawsuit. We have to hold the trial sooner rather than later."

He lets go of her fingers. "I'd really be much happier if you hadn't named me as your champion."

"Hush." The scenery changes: her throne is gone, and instead she's sitting on the arm of his chair, almost on top of him. "Listen. I had a good reason."

"Reason?"

"You have choice of weapons. In fact, you have the choice of the field of compurgation. This isn't just 'hit 'em with a sword until they die' time." She grins, impishly. "The whole point of a legal system that mandates trial by combat for commercial lawsuits, as opposed to an adjudication system, is to work out who's a fitter servant of society and hence deserving of preferential treatment. It's crazy to apply the same legal model to resolving corporate disputes that we use for arguments among people, especially as most companies are now software abstractions of business models; the interests of society are better served by a system that encourages efficient trade activity than by one that encourages litigation. It cuts down on corporate bullshit while encouraging the toughest ones to survive, which is why I *was* going to set up the trial as a contest to achieve maximum competitive advantage in a xenocommerce scenario. Assuming they really are traders, I figure we have more to trade with them than some damn lawyer from the depths of Earth's light-cone."

Pierre blinks. "Um." Blinks again. "I thought you wanted me to sideload some kind of fencing kinematics program and *skewer* the guy."

"Knowing how well I know you, why did you ever think that?" She slides down the arm of his chair and lands on his lap: twists round to face him in point-blank close-up. "Shit, Pierre, I *know* you're not some kind of macho psychopath!"

"But your mother's lawyers—"

She shrugs dismissively. "They're *lawyers*. Used to dealing with precedents. Best way to fuck with their heads is to change the way the universe works." She leans against his chest. "You'll make mincemeat of them. Profit-to-earnings ratio through the roof, blood on the stock exchange floor." His hands meet around the small of her back. "My hero!"

The Tuileries are full of confused lobsters.

Aineko has warped this virtual realm, implanting a symbolic gateway in the carefully manicured gardens outside. The gateway is about two meters in diameter, a verdigris-coated orouborous loop of bronze that sits like an incongruous archway astride a gravel path in the grounds. Giant black lob-

sters—each the size of a small pony—shuffle out of the loop's baby-blue buffer field, antennae twitching; they wouldn't be able to exist in the real world, but the physics model here has been amended to permit them to breathe and move by special dispensation.

Amber sniffs derisively as she enters the great reception room of the Sully wing. "Can't trust that cat with anything," she mutters.

"It was your idea, wasn't it?" asks Su Ang, trying to duck past the zombie ladies-in-waiting who carry Amber's train. Soldiers line the passage to either side, forming rows of steel to let the queen pass unhindered.

"To let the cat have its way, yes," Amber is annoyed. "But I didn't mean to let it wreck the continuity! I won't have it!"

"I never saw the point of all this mediaevalism, myself," Ang observes. "It's not as if you can avoid the singularity by hiding in the past." Pierre, following the queen at a distance, shakes his head, knowing better than to pick a fight with Amber over her idea of stage scenery.

"It looks good," Amber says tightly, standing before her throne and waiting for the ladies-in-waiting to arrange themselves before her. She sits down carefully, her back straight as a ruler, voluminous skirts belling up: her dress is an intricate piece of sculpture that uses the human body within as a support. "It impresses the yokels and looks convincing on narrowcast media. It provides a prefabricated sense of tradition. Hints at the political depths of fear and loathing intrinsic to my court's activities and tells people not to fuck with me. And it reminds us where we've come from, while not giving away anything about where we're going."

"But that doesn't make any difference to a bunch of alien *lobsters*," points out Su Ang. "They lack the reference points to understand it." She moves to stand behind the throne. Amber glances at Pierre, waves him over. Pierre looks around, seeking real people, not the vacant eigenfaces of the zombies that give this scenery added biological texture. There in the red gown, isn't that Donna the Journalist? And over there, too, with shorter hair and wearing male drag: she gets everywhere. That's Angus, sitting behind the bishop. And—he sighs. "*You* tell her," Ang implores him.

"I can't," he admits. "We're trying to establish communication, aren't we? But we don't want to give too much away about what we are, how we think. A historical distancing act will keep them from learning too much about us: the phase space of technological cultures that could have descended from these roots is too wide to analyze easily. So we're leaving them with the lobster translators and not giving anything away. Try to stay in character as a fifteenth century duchess from Albì—it's a matter of national security."

"Humph." Ang frowns as a flunky hustles forward to place a folding chair behind her. She turns to face the expanse of red and gold carpet that stretches to the doorway as trumpets blat and the doors swing open to admit the deputation of lobsters.

The huge lobsters, black and spiny, look ominous. Their monochrome carapaces are at odds with the brightly colored garb of the human crowd: their antennae are large and sharp as swords. But for all that, they advance hesitantly, eye turrets swiveling from side to side as they take the scene in. Their tails drag ponderously on the carpet, but they have no trouble standing.

The first of the lobsters halts short of the throne and angles itself to train an eye on Amber. "Am inconsistent," it complains: "there is no liquid hydrogen monoxide here, and you-species am misrepresented by initial contact. Inconsistency, explain?"

"Welcome to the human physical space-traveling interface unit *Field Circus*," Amber replies calmly. "I am pleased to see your translator is working adequately. You are correct, there is no water here: the lobsters don't normally need it when they visit us. And we humans are not water-dwellers. May I ask who you are when you're not wearing borrowed lobster bodies?"

Confusion. The second lobster rears up and clatters its long, armored antennae together; soldiers to either side tighten their grips on their spears, but it drops back down again soon enough.

"We are the Wunch," announces the first lobster, speaking clearly. "This is a body compliant translation layer. Based on map received from yourspace, units forty thousand trillion light-kilometers ago?"

"*He means twenty years,*" Pierre whispers on a private channel Amber has multicast for the other real humans in the audience chamber reality. "*They've confused space and time for measurement purposes. Does this tell us something?*"

"*Relatively little,*" comments someone else—Chandra? A round of polite laughter greets the joke, and the tension in the room eases slightly.

"We are the Wunch," the lobster repeats. "We come to exchange interest. What have you got that we want?"

Faint frown-lines appear on Amber's forehead. Pierre can see her thinking very rapidly. "We consider it impolite to ask," she says quietly.

Clatter of claws on underlying stone floor. Chatter of clicking mandibles. "You accept our translation?" asks the leader.

"Are you referring to the transmission you sent us, uh, thirty thousand trillion light-kilometers behind?" asks Amber.

The lobster bobs up and down on its legs. "True. We send."

"We cannot integrate that network," Amber replies blandly, and Pierre forces himself to keep a straight face. (Not that the lobsters can read human body language yet, but they'll undoubtedly be recording everything that happens here for future analysis.) "They come from a radically different species. Our goal in coming here is to connect our species to the network. We wish to exchange advantageous information with many other species."

Concern, alarm, agitation. "You cannot do that! You are not *untranslatable entity signifier*."

Amber raises a hand. "You said *untranslatable entity signifier*. I did not understand that. Can you paraphrase?"

"We, like you, are not *untranslatable entity signifier*. The network is for *untranslatable entity signifier*. We are to the *untranslatable concept #1* as a single-celled organism is to ourselves. You and we cannot *untranslatable concept #2*. To attempt trade with *untranslatable entity signifier* is to invite death or transition to *untranslatable concept #1*."

Amber snaps her fingers: time freezes. She glances round at Su Ang, Pierre, the other members of her primary team. "Opinions, anyone?"

Aineko, hitherto invisible, sits up on the carpet at the foot of the dais: "I'm not sure. The reason those macros are tagged is that there's something wrong with their semantics."

"Wrong with—how?" asks Su Ang.

The cat grins, cavernously, and begins to fade. "Wait!" snaps Amber.

Aineko continues her fade, but leaves a shimmering presence behind: not a grin, but a neural network weighting map, three dimensional and incomprehensibly complicated. "The *untranslatable entity concept #1* when mapped onto the Lobster's grammar network has elements of 'god' over-

loaded with attributes of mysticism and Zen-like incomprehensibility. But I'm pretty sure that what it *really* means is 'optimized conscious upload that runs much faster than realtime.' A type-one weakly superhuman entity, like, um, the folks back home. The implication is that this Wunch wants us to view them as gods." The cat fades back in. "Any takers?"

"Small-town hustlers," mutters Amber. "Talking big—or using a dodgy metagrammar that makes them sound bigger than they are—to bilk the hayseeds new to the big city."

"Most likely." Aineko turns and begins to wash her flank.

"What are we going to do?" asks Su Ang.

"Do?" Amber raises a pencil-lined eyebrow, then flashes a grin that chops a decade off her apparent age. "We're going to have fun!" She snaps her fingers again and time unfreezes: there's no change in continuity except that Aineko is still present, at the foot of the throne. The cat looks up and gives the queen a dirty look. "We understand your concern," Amber says smoothly, "but we have already given you the physiology models and neural architecture of the bodies that you are wearing. We want to communicate: why won't you show us your real selves, or your real language?"

"This is trade language!" protests Lobster number one. "Wunch am/are metabolically variable coalition from number of worlds. No uniformity of interface. Easiest to conform to one plan and speak one tongue optimized for your comprehension."

"Hmm." Amber leans forward. "Let me see if I understand you. You are a coalition of individuals from a number of species. You prefer to use the common user interface model we sent you, and offered us the language module you're using for an exchange? And you want to trade with us."

"Exchange interest," the Wunch emphasizes, bouncing up and down on its legs. "Can offer much! Summaries of a thousand civilizations. Safe tunnels to a hundred archives on the net suitable for beings who are not *untranslatable entity signifier*. Able to control risks of communication. Have technique of manipulating matter at molecular level. Solution to algorithmic iterated systems based on quantum entanglement."

"*Old-fashioned nanotechnology and shiny beads to dazzle the primitives,*" Pierre mutters on Amber's multicast channel. "*How backward do they think we are?*"

"*The physics model in here is really over-done,*" comments Boris. "*They may even think this is real, that we're primitives coat-tailing it on the back of the Lobsters' efforts.*"

Amber forces a smile. "That is most interesting!" she trills at the Wunch's representatives. "I have appointed two representatives who will negotiate with you; this is an internal contest within my own court. I commend to you Pierre Naqet, my own commercial representative. In addition, you may want to deal with Alan Glashwiecz, an independent factor who is not currently present. Others may come forward in due course if that is acceptable."

"It pleases us," says Lobster number one. "We are tired and disoriented by the long journey through gateways to this place. Request resumption of negotiations later?"

"By all means." Amber nods. A sergeant-at-arms, a mindless but impressive zimboe controlled by her spider's nest of personality threads, blows a sharp note on his trumpet; the first audience is at an end.

* * *

Outside the light-cone of the *Field Circus*, on the other side of the event horizon that separates Amber's little kingdom in motion from the depths of empire time that grip the solar system's entangled quantum networks, a singular new reality is taking shape.

Welcome to the moment of maximum change.

About ten billion humans are alive in the solar system, each mind surrounded by an exocortex of distributed agents, threads of personality spun right out of their heads to run on the clouds of utility fog—infinitely flexible computing resources as thin as aerogel—in which they live. The foggy depths are alive with high-bandwidth sparkles; most of Earth's biosphere has been wrapped in cotton wool and preserved for future examination. For every living human, a thousand million software agents carry information into the farthest corners of the consciousness address space.

The sun, for so long an unremarkable mildly variable G2 dwarf, has vanished within a gray cloud that englobes it except for a narrow belt around the plane of the ecliptic. Sunlight falls, unchanged, on the inner planets: all except Mercury, which is no longer present, having been dismantled completely and turned into solar-powered high-temperature nanocomputers. A much fiercer light falls on Venus, now surrounded by glittering ferns of carbon crystals that pump angular momentum into the barely spinning planet via huge superconducting loops wound around its equator: this planet, too, is due to be dismantled. Jupiter, Neptune, Uranus—all sprout rings as impressive as Saturn's: but the task of cannibalizing the gas giants will take many times longer than the small rocky bodies of the inner system.

The ten billion inhabitants of this radically changed star system remember being human; almost half of them pre-date the millennium. Some of them still *are* human, untouched by the drive of meta-evolution that has replaced blind Darwinian change with a goal-directed teleological progress; they cower in gated communities and hill forts, mumbling prayers and cursing the ungodly tamperers with the natural order of things. But eight out of every ten living humans are included in this phase-change: it's the most inclusive revolution in the human condition since the discovery of speech.

A million outbreaks of gray goop—runaway nanoreplicator excursions—threaten to raise the temperature of the biosphere dramatically: they're all contained by the planetary-scale immune system fashioned from what was once the World Health Organization. Weirder catastrophes threaten the boson factories in the Oort Cloud; antimatter factories hover over the solar poles. Sol system shows all the symptoms of a runaway intelligence excursion, exuberant blemishes as normal for a technological civilization as skin problems on a human adolescent.

The economic map of the planet has changed beyond recognition. Both capitalism and communism, bickering ideological children of a proto-industrial outlook, are as obsolete as the divine right of kings: companies are alive, and dead people may live again too. Globalism and tribalism have run to completion, diverging respectively into homogeneous interoperability and the schwartzchild radius of insularity. Beings that remember being human plan the deconstruction of Jupiter, the creation of a great simulation space that will expand the habitat available within the solar system; by converting all the planets into processors, they can accommodate as many human-equivalent minds as a galactic civilization—one with a planet hosting ten billion in orbit around every star in the galaxy.

A more mature version of Amber lives down in the surging chaos of near-

Jupiter space: there's an instance of Pierre, too, although he has relocated light-hours away, near Neptune. Whether she still sometimes thinks of her relativistic twin, nobody can tell. In a way, it doesn't matter: because by the time the *Field Circus* returns to Jupiter orbit, as much subjective time will have elapsed as will flash by in the real universe between this moment and the end of the era of star formation in this galaxy.

"As your theologian, I am telling you that they are not gods."

Amber nods patiently. Watches Sadeq closely.

Sadeq coughs grumpily. "Tell her, Boris."

Boris tilts his chair back and turns it toward the queen. "He is right, Amber. They are traders; not clever ones, either. Is hard to get handle on their semiotics while they hide behind the lobster model we uploaded in their direction twenty years ago, but are certainly not crusties, and are definite not human either. Or transhuman. My guess, they are bunch of dumb hicks who get hands on toys left behind by much smarter guys. Like the rejectionist factions back home. Imagine they are waking up one morning and find everyone else is gone to the great upload environment in the sky. They have the planet to themselves. What you think they do with whole world, with any gadgets they trip over? Some will smash everything they come across, but others not so stupid. But they think *small*. Scavengers, deconstructionists. Their whole economic outlook are negative-sum game. Go visit aliens to rip them off, take ideas, not expand selves and transcend."

Amber stands up, walks toward the windows at the front of the bridge. In black jeans and chunky sweater she barely resembles the feudal queen whose identity she takes on for visitors. "Taking them on board was a risk."

"How many angels can dance on the head of a pin?" Sadeq smiles crookedly. "We have an answer. But they may not even realize they are dancing with us. These are not the gods you were afraid of finding."

"No." Amber sighs. "Not too different from us, though. I mean, we aren't exactly well-adapted to this environment, are we? We tote these body-images along, rely on fake realities that we can map into our human-style senses. We're emulations, not native AI's. Where's Su Ang?"

"I can find her." Boris frowns.

"I asked her to analyze the aliens' arrival times," Amber adds as an afterthought. "They're close; too close. I think everything Aineko came up with is flawed. The *real* owners of this network we've plugged into probably use much higher-level protocols to communicate; sapient packets to build effective communications gateways. This Wunch, they probably lurk in wait for newbies to exploit. Pedophiles hiding outside the school gate: I don't want to give them that opportunity before we make contact with the real thing!"

"You may have little choice," says Sadeq. "If they are without insight, as you suspect, they may become afraid if you edit their environment. They may lash out. I doubt they even understand how they created the contaminated metagrammar that they transmitted back to us. It will be to them just a tool that makes simple-minded aliens more gullible, easier to negotiate with. Who knows where they got it?"

"A grammatical weapon." Boris spins himself round slowly. "Build propaganda into your translation software if you want to establish a favorable trading relationship. How cute. Haven't these guys ever heard of Newspeak?"

"Probably not," Amber says slowly, pausing for a moment to spawn spectator threads to run down the book and all three movie versions of *1984*, fol-

lowed by the sharecropped series of sequel novels. She shivers uncomfortably as she re-integrates them. "Ick. That's not a very nice vision. Reminds me of—" she snaps her finger, trying to remember Dad's favorite— "Dilbert."

"Friendly fascism," says Sadeq. "It matters not, whosoever is in charge. I could tell you tales from my parents, of growing up with a revolution. To never harbor self-doubt is poison for the soul: and these aliens want to inflict their certainties upon us."

"I think we ought to see how Pierre is doing," Amber says aloud. "I certainly don't want them poisoning him." She grins. "That's *my* job."

Donna the Journalist is everywhere simultaneously. It's a handy talent: makes for even-handed news coverage when you can interview both sides at the same time.

Right now one of her is in the bar with Alan Glashwiecz, who evidently hasn't realized that he can modulate his ethanol dehydrogenase levels voluntarily and who is consequently well on the way to being steaming drunk. Donna is assisting the process: she finds it fascinating to watch this bitter young man who has lost his youth to a runaway self-enhancement process.

"I'm a full partner," he says bitterly, "in Glashwiecz and Selves. I'm one of the Selves. We're all partners, but it's only Glashwiecz Prime who has any clout. The old bastard: if I'd known I'd grow up to become *that,* I'd have run away to join some hippie antiglobalist commune instead." He drains his glass, demonstrating his oropharyngeal integrity, snaps his fingers for a refill. "I just woke up one morning to find I'd been resurrected by an older self. Said he valued my youthful energy and optimistic outlook, then offered me a minority stake with stock options that would take five years to vest. The bastard."

"Tell me about it," Donna coaxes sympathetically. "Here we are, stranded among idiopathic types, not among them a single multiplex—"

"Damn straight." Another bottle of Bud appears in Glashwiecz's hands. "One moment I'm standing in this apartment in Paris facing total humiliation by a cross-dressing commie asshole called Macx and his slimy French manager bitch, and the next I'm on the carpet in front of my alter-ego's desk and he's offering me a job as junior partner. It's seventeen years later, all the weird nonsense that guy Macx was getting up to is standard business practice, and there's six of me in the outer office taking research notes because myself-as-senior-partner doesn't trust anyone else to work with him. It's humiliating, that's what it is."

"Which is why you're here." Donna waits while he takes a deep swig from the bottle.

"Yeah. Better than working for myself, I can tell you—it's not like being self-employed. You know how you sometimes get distant from your work? It's really bad when you see yourself from the outside with another half-gigasecond of experience and the new-you isn't just distant from the client base, he's distant from the you-you. So I went back to college and crammed up on artificial intelligence law and ethics, the jurisprudence of uploading, and recursive tort. Then I volunteered to come out here. He's still handling *her* account, and I figured—" Glashwiecz shrugged.

"Did any of the delta-you's contest the arrangement?" asks Donna, spawning ghosts to focus in on him from all angles. For a moment she wonders if this is wise: if maybe her audience will try and get a handle on her true identity by watching how she observes. But she dismisses the thought—it's an overly subtle risk.

Glashwiecz's face is a study in perspectives. "Oh, one did," he says dismissively; one of Donna's viewports captures the contemptuous twitch in his cheek. "I left her in my apartment freezer. Figured it'd be a while before anybody noticed. It's not murder—I'm still here, right?—and I'm not about to claim tort against myself. I think. It'd be a left-recursive lawsuit, anyway, if I did it to myself."

"The aliens," prompts Donna. "And the trial by combat. What's your take on that?"

Glashwiecz grins lop-sidedly. "Little bitch-queen takes after her father, doesn't she? He's a bastard, too. The competitive selection filter she's imposed is evil—it'll cripple her society if she leaves it in place for too long, but in the short run, it's a major advantage. So she wants me to trade for my life and I don't get to lay my formal claim against her unless I can out-perform her pet day trader, that punk from Marseilles. Yes? What *he* doesn't know is, I've got an *edge*. Full disclosure." He lifts his bottle drunkenly. "Y'see, I know that *cat*. One that's gotta brown at-sign on its side, right? It used to belong to Queenie-darling's old man, Manfred, the bastard. You'll see. Her mom, Pamela, Manfred's ex, she's my client in this case. And she gave me the cat's ackle keys. *Access* control. Get a hold of its brains and grab that damn translation layer it stole from the CETI@home mob. *Then* I can talk to them straight."

The drunken future-shocked lawyer is on a roll. "I'll get their shit and I'll disassemble it. Disassembly is the future of industry, y'know?"

"Disassembly?" asks the reporter, watching him in disgusted fascination from behind her mask of objectivity.

"Hell, yeah. There's a singularity going on, that implies disequilibrium. An' wherever there's a disequillibrium, someone is going to get *rich* disassembling the left-overs. Listen, I once knew this econo-economist, that's what he was. Worked for the eurofeds, rubber fetishist. He tole me about this fact'ry near Barcelona. It had a disassembly line running in it. 'Spensive servers in boxes'd roll in at one end. Be unpacked. Then workers'd take the cases off, strip the disk drives, memory, processors, bits'n'guts out. Bag and tag job. Throw the box, what's left, 'cause it wasn't worth dick. Thing is, the manufact'rer charged so much for parts it was worth their while to buy whole machines'n'strip them. To bits. And sell the *bits*. Hell, they got an enterprise award for ingenuity! All 'cause they knew that *disassembly* was the wave of the future."

"What happened to the factory?" asks Donna, unable to tear her eyes away.

Glashwiecz waves an empty bottle at the starbow that stretches across the ceiling. "Ah, who gives a fuck? They closedown round about ten years 'go. Moore's Law topped out, killed the market. But disassembly—production-line cannibalism—itsa way to go. Take old assets an' bring new life to them. A fully 'preciated fortune." He grins, eyes unfocused with greed. "'S'what I'm gonna do to those space lobsters. Learn to talk their language an'll never know what hit 'em!"

The tiny starship drifts in high orbit above a turbid brown soup of atmosphere. Deep in the gravity well of Hyundai +4904/-56, it's a speck of dust trapped between two light sources: the brilliant sapphire stare of Amber's propulsion lasers in Jovian orbit, and the emerald insanity of the router itself, a hypertoroid spun from strange matter.

The bridge of the *Field Circus* is in constant use at this time, a meeting ground for minds with access to the restricted areas. Pierre is spending more and more time here, finding it a convenient place to focus his trading campaign and arbitrage macros. At the same time that Donna is picking the multiplexed lawyer's strategy apart, Pierre is present in neomorphic form—a quicksilver outline of humanity, six-armed and two-headed, scanning with inhuman speed through tensor maps of the information traffic density surrounding the router's clump of naked singularities.

There's a flicker in the emptiness at the rear of the bridge, then Su Ang has always been there. She watches Pierre in contemplative silence for a minute. "Do you have a moment?"

Pierre superimposes himself: one shadowy ghost keeps focused on the front panel, but another instance turns round, crosses his arms, waits for her to speak.

"I know you're busy—" she begins, then stops. "Is it *that* important?" she asks.

"It is." Pierre blurs, re-synchronizing his instances. "The router—there are four wormholes leading off from it, did you know that? Each of them is radiating at about 10^{11} kelvins, and every wavelength is carrying data connections, multiplexed, with a protocol stack that's at least eleven layers deep but maybe more—they show signs of self-similarity in the framing headers. You know how much data that is? It's about 10^{12} times as much as our high-bandwidth uplink from home. But compared to what's on the other side of the 'holes—" he shakes his head.

"It's big?"

"It's *unimaginably* big! These wormholes, they're a *low bandwidth* link compared to the minds they're hooking up to." He blurs in front of her, unable to stay still and unable to look away from the front panel. Excitement or agitation? Su Ang can't tell; with Pierre, sometimes the two states are indistinguishable. He gets emotional easily. "I think we have the outline of the answer to the Fermi paradox. Transcendents don't go traveling because they can't get enough *bandwidth*—trying to migrate through one of these wormholes would be like trying to download your mind into a fruit fly, if they are what I think they are—and the slower-than-light route is out, too, because they couldn't take enough computronium along. Unless—"

He's off again. But before he can blur out, Su Ang steps across and lays hands on him. "Pierre. Calm down. Disengage. Empty yourself."

"I can't!" He really *is* agitated, she sees. "I've got to figure out the best trading strategy to get Amber off the hook with that lawsuit, then tell her to get us out of here; being this close to the router is seriously dangerous! The Wunch is the *least* of it!"

"Stop."

He pauses his multiplicity of presences, converges on a single identity focused on the here-and-now. "Yes?"

"That's better." She walks round him, slowly. "You've got to learn to deal with stress more appropriately."

"Stress!" Pierre snorts. He shrugs, an impressive gesture with three sets of shoulderblades. "That's something I can turn off whenever I need to. Side-effect of this existence; we're pigs in cyberspace, wallowing in fleshy simulations but unable to experience the new environment raw. What did you want from me, Ang? Honestly? I'm a busy man: I've got a trading network to set up."

"We've got a problem with the Wunch right now, even if you think something worse is out there," Ang says patiently. "Boris thinks they're parasites, negative-sum gamers who stalk newbies like us. Glashwiecz is apparently talking about cutting a deal with them; Amber's suggestion is that you ignore them completely, cut them out and talk to anyone else who'll listen."

"Anyone else who'll listen: right," Pierre says heavily. "Any other gems of wisdom to pass on from the throne?"

Ang takes a deep breath. He's infuriating, she realizes. And worst of all, he doesn't notice it. Infuriating but cute. "You're setting up a trading network, right?" she asks.

"Yes. A standard network of independent companies, instantiated as cellular automata within the Ring Imperium switched legal service environment." He relaxes slightly. "Each one has access to a compartmentalized chunk of intellectual property and can call on the corrected parser we got from that cat. They're set up to communicate with a blackboard system—a souk—and I'm bringing up a link to the router, a multicast link that'll broadcast the souk's existence to anyone who's listening. Trade . . ." his eyebrows furrow. "There are at least two different currency standards in this network, used to buy quality-of-service precedence and bandwidth; they depreciate with distance, as if the whole concept of money was invented to promote the development of long-range network links. If I can get in first, when Glashwiecz tries to cut in on the dealing by offering IP at discounted rates—"

"He's not going to, Pierre," she says as gently as possible. "Listen to what I said: Glashwiecz is going to focus on the Wunch. He's going to offer them a deal. Amber wants you to *ignore* them. Got that?"

"Got it." There's a hollow *bong!* from one of the communication bells. "Hey, that's interesting."

"What is?" She stretches, neck extending snake-like so that she can see the window on underlying reality that's flickered into existence in the air before him.

"An ack from . . ." he pauses, then plucks a neatly reified concept from the screen in front of him and presents it to her in a silvery caul of light. "About two hundred light-years away! Someone wants to talk." He smiles. Then the front panel workstation *bongs* again. "Hey again. I wonder what that says."

It's the work of a moment to pipe the second message through the translator. Oddly, it doesn't translate at first; Pierre has to correct for some weird destructive interference in the fake lobster network before it'll spill its guts. "*That's* interesting," he says.

"I'll say." Ang lets her neck collapse back to normal. "I'd better go tell Amber."

"You do that," Pierre says worriedly. He makes eye contact with her, but what she's hoping to see in his face just isn't there; he's wearing his emotions entirely on the surface. "I'm not surprised their translator didn't want to pass that message along."

"Corrupted grammar," Ang murmurs, and bangs out in the direction of Amber's audience chamber. "*And* threats." The Wunch, it seems, have acquired a *very* bad reputation somewhere along the line—and Amber needs to know.

Glashwiecz leans toward lobster number one, stomach churning. It's only a real-time kilosecond since his barroom interview, but in the intervening

subjective time he's abolished a hangover, honed his brief, and decided to act. In the Tuileries. "You've been lied to," he confides quietly, trusting the privacy ackles that Amber's mother gave him—access lists that give him a degree of control over the regime within this virtual universe that the cat dragged in.

"Lied? Context rendered horizontal in past, or subjected to grammatical corruption? Linguistic evil?"

"The latter." Glashwiecz enjoys this, even though it forces him to get rather closer to the two-meter-long virtual crustacean than he'd like. Showing a mark how they've been scammed is always good, especially when you hold the keys to the door of the cage they're locked inside. "They are not telling you the truth about this system."

"We received assurances," lobster number one says clearly. Its mouthparts move ceaselessly—the noise comes from somewhere inside its head. "You do not share this phenotype. Why?"

"That information will cost you," says Glashwiecz. "I am willing to provide it on credit."

They haggle briefly: an exchange rate in questions is agreed, as is a trust metric to grade the answers by. "Disclose all," insists the Wunch negotiator.

"There are multiple sentient species on the world we come from," says the lawyer. "The form you wear belongs to only one—one that wanted to get away from the form *I* wear. The original conscious tool-creating species. Some of the species today are artificial, but all of us trade information for self-advantage."

"This is good to know," the lobster assures him.

"What is your true form?" asks Glashwiecz.

"Wait and I show you," says the lobster. It begins to shudder.

"What are you doing—"

"Wait." The lobster twitches, writhing slightly, like a portly businessman adjusting his underwear after a heavy business lunch. Disturbing shapes move, barely visible through the thick chitinous armor. "We want your help," the lobster explains, voice curiously muffled. "Want to establish direct trade links. Physical emissaries, yes?"

"Yes, that's very good," Glashwiecz agrees excitedly: it's exactly what he's hoped for, the sought-after competitive advantage that will prove his fitness in Amber's designated trial by corporate combat. "You're going to deal with us directly without using that shell interface?"

"Agreed." The lobster trails off into muffled silence; little crunching noises trickle out of its shell. Then Glashwiecz hears footsteps behind him on the gravel path.

"What are you doing here?" he demands, looking round. It's Pierre, back in standard human form—a sword hangs from his belt, and there's a big wheellock pistol in his hands. "Hey!"

"Step away from the alien, lawyer," Pierre warns, raising the gun.

Glashwiecz glances back at lobster number one. It's pulled its front inside the protective shell and it's writhing now, rocking from side to side alarmingly. Something inside the shell is turning black, acquiring depth and texture. "I stand on counsel's privilege," Glashwiecz insists: "speaking as this alien's attorney I must protest in the strongest terms—"

Without warning, the lobster lurches forward and rises up on its rear claws. It reaches out with huge claws, chellipeds coated with spiny hairs, and grabs Glashwiecz by his arms. "Hey!"

Glashwiecz tries to turn away, but the lobster is already looming over him, maxillipeds and maxilae reaching out from its head. There's a sickening crunch as one of his elbow joints crumbles, patella shattered by the closing jaws of a chelliped. He draws breath to scream, then the four small maxilae grip his head and draw it down toward the churning mandibles.

Pierre scurries sideways, trying to find a line of fire on the lobster that doesn't pass through the lawyer's body. The lobster isn't cooperating; it turns on the spot, clutching Glashwiecz's spasming body to itself. There's a stench of shit, and blood is squirting from its mouthparts: something is very wrong with the biophysics model here, the realism turned all the way up to max.

"Merde," whispers Pierre: he fumbles with the bulky trigger, and there's a faint whirring sound. No explosion.

More wet crunching sounds follow as the lobster demolishes the lawyer's face and swallows convulsively, sucking his head and shoulders all the way into its gastric mill.

Pierre glances at the heavy handgun. "*Shit!*" he screams. He looks back at the lobster: then turns and runs for the nearest wall. There are other lobsters loose in the formal garden. "*Amber; emergency!*" he sends over their private channel. "*Hostiles in the Louvre!*"

The lobster that's taken Glashwiecz hunkers down over the body and shudders. Pierre desperately winds the spring on his gun, too rattled to check that it's loaded. He glances back at the alien intruder. "*They've sprung the biophysics model,*" he sends. *I could die in here,* he realizes, momentarily shocked. *This instance of me could die forever.*

The lobster shell sitting in the pool of blood and human wreckage splits in two. A humanoid form begins to uncurl from within it, pale-skinned and glistening wet: vacant blue eyes flicker from side to side as it stretches and stands upright, wobbling uncertainty on its two unstable legs. Its mouth opens and a strange gobbling hiss comes forth.

Pierre recognizes her. "What are you doing here?" he yells.

The nude woman turns toward him. She's the spitting image of Amber's mother, except for the chellipeds she has in place of hands. She hisses: "*Equity!*" and takes a wobbly step toward him, pincers clacking.

Pierre winds the firing handle: there's a crash of gunpowder and smoke, a blow that nearly sprains his elbow, and the nude woman's chest erupts in a spray of blood. She snarls at him wordlessly and staggers—then ragged flaps of bloody meat close together, knitting shut with improbable speed. She resumes her advance.

"I *told* Amber that the Matrix would be more defensible," Pierre snarls, dropping the firearm and drawing his sword as the alien turns in his direction and raises arms that end in pincers. "*We need guns, dammit! Lots of guns!*"

"Waaant equity," hisses the alien intruder.

"You *can't* be Pamela Macx," says Pierre, his back to the wall, keeping the sword point before the lobster-woman-thing. "She's in a nunnery in Armenia. You pulled that out of Glashwiecz's memories—he worked for her, didn't he?"

Claws go snicker-snack before his face. "Investment partnership!" screeches the harridan. "Seat on the board! Eat brains for breakfast!" It lurches sideways, trying to get past his guard.

"I don't fucking *believe* this," Pierre snarls. The Wunch-creature jumps

at just the wrong moment and slides onto the point of his blade, claws clacking hungrily, but Pierre slides away, nearly leaving his skin on the rough bricks of the wall—and what's good for one is good for all, as the hacked model in force in this reality compels the attacker to groan and collapse.

Pierre pulls the sword out; then, nervously glancing over his shoulder, whacks at her neck. The impact jars his arm but he keeps hacking until there's blood spraying everywhere, blood on his shirt, blood on his sword, and a round thing sitting on a stump of savaged neck nearby, jaw working soundlessly in undeath.

He looks at it for a moment, then his stomach rebels and tries to empty itself into the mess. "*Where the hell* is *everybody?*" he broadcasts on the private channel. "*Hostiles in the Louvre!*"

He straightens up, gasping for breath. He feels *alive,* frightened and appalled and exhilarated simultaneously. The crackle of bursting shells on all sides drowns out the birdsong as the Wunch's emissaries adopt a variety of new and supposedly more lethal forms. "*They don't seem to be very clear on how to take over a simulation space,*" he adds. "*Maybe we already* are *untranslatable concept number #1.*"

"*Don't worry, I've cut off the incoming connection,*" sends Su Ang. "*This is just a bridgehead force; the invasion packets are bouncing.*"

Blank-eyed men and women in dusty black uniforms are hatching from the lobster shells, stumbling and running around the grounds of the royal palace like confused Huguenot invaders.

Boris winks into reality behind Pierre. "Which way?" he demands, pulling out an anachronistic but lethal katana.

"Over here. Let's work this together." Pierre jacks his emotional damper up to a dangerously high setting, suppressing natural aversion reflexes and temporarily turning himself into a sociopathic killer; he stalks toward an infant lobster-thing with big black eyes and a covering of white hair that mewls at him from a rose bed, and Boris looks away while he kills it. Then one of the larger ones makes the mistake of lunging at Boris and he chops at it reflexively.

Some of the Wunch try to fight back when Pierre and Boris try to kill them, but they're handicapped by their anatomy; a curious mixture of crustacean and human, claw and mandible against sword and dagger. When they bleed, the ground soaks with the cuprous hue of lobster juice.

"Let's fork," suggests Boris. "Get this over with." Pierre nods, dully—everything around him is wrapped in a layer of don't-care, except for a glowing dot of artificial hatred—and they fork, multiplying their state vectors to take full advantage of the virtualization facilities of this universe. There's no need for reinforcements; the Wunch focused on attacking the biophysics model of the universe, making it mimic a physical reality as closely as possible, and paid no attention to learning the more intricate tactics that war in a virtual space demands.

Presently Pierre finds himself in the audience chamber, face and hands and clothing caked in hideous gore, leaning on the back of Amber's throne. There's only one of him now. One of Boris—the only one?—is standing near the doorway. He can barely remember what has happened, the horrors of parallel instances of mass-murder blocked from his long-term memory by a high-pass trauma filter. "Looks clear," he calls aloud. "What shall we do now?"

"Wait for Catherine di Medici to show up," says the cat, its grin materializing before him like a numinous threat. "Amber *always* finds a way to blame her mother. Or didn't you already know that?"

Pierre glances at the bloody mess on the footpath outside where the first lobster-woman attacked Glashwiecz. "I already did for her, I think." He remembers the action in the third person, all subjectivity edited out. "The family resemblance was striking," the thread that still remembers her in working memory murmurs: "I just hope it's only skin-deep." Then he forgets the act of apparent murder forever. "Tell the queen I'm ready to talk."

Welcome to the down-slope on the far side of the curve of accelerating progress.

Back in the solar system, Earth orbits through a dusty tunnel in space: sunlight still reaches the birthworld, but much of the rest of the star's output has been trapped by the growing concentric shells of computronium built from the wreckage of the innermost planets.

Two billion or so mostly unmodified humans scramble in the wreckage of the phase transition, not understanding why the vast superculture they so resented has fallen quiet: little information leaks through their fundamentalist firewalls, but what there is shows a disquieting picture of a society where there are no *bodies* any more. Utility foglets blown on the wind form aerogel towers larger than cyclones, remove the last traces of physical human civilization from most of Europe and the North American coastlines; enclaves huddle behind their walls and wonder at the monsters and portents roaming the desert of post-industrial civilization, mistaking acceleration for collapse.

The hazy shells of computronium that ring the sun—concentric clouds of orbiting nanocomputers, powered by sunlight, like the packed layers of a matrioshka doll—are still immature, holding barely a thousandth of the physical planetary mass of the system, but they already support a classical computational density of 10^{42} MIPS; enough to support a billion civilizations as complex as the one that existed immediately before the great disassembly. The conversion hasn't yet reached the surfaces of the gas giants, and some scant outer-system enclaves remain independent—Amber's Ring Imperium still exists as a separate entity, and will do so for some years to come—but the inner solar system planets, with the exception of Earth, have been colonized more thoroughly than any dusty NASA proposal from the dawn of the space age could have envisaged.

From outside the Accelerated civilization, it isn't really possible to know what's going on *inside*. The problem is bandwidth: while it's possible to send data in and get data out, the sheer amount of computation going on in the virtual spaces of the Acceleration dwarfs any external observer. Inside that swarm, minds a trillion or more times as complex as humanity think thoughts as far beyond human imagination as a microprocessor is beyond a nematode worm. A million random human civilizations flourish in worldscapes tucked in the corner of this world-mind; death is abolished, life is triumphant. A thousand ideologies flower, human nature adapted where necessary to make this possible. Ecologies of thought are forming in a Cambrian explosion of ideas: for the solar system is finally rising to consciousness, and mind is no longer restricted to the mere kilotons of gray fatty meat harbored in fragile human skulls.

Somewhere in the Acceleration, colorless green ideas adrift in furious

sleep remember a tiny starship launched years ago, and pay attention. Soon, they realize, the starship will be in position to act as their proxy in an ages-long conversation. Negotiations for access to Amber's extrasolar asset commence; the Ring Imperium prospers.

But first, the operating software on the human side of the network link will require an upgrade.

The audience chamber in the *Field Circus* is crammed: everybody aboard the ship—except the still-frozen lawyer and the alien barbarian intruders—is present.

"I'm not saying you have to follow me," says Amber, addressing her court. "Just, that it's what we came here for. We've established that there's enough bandwidth to transmit people and their necessary support VM's; we've got some basic expectancy of goodwill at the other end, or at least an agalmic willingness to gift us with advice about the untrustworthiness of the Wunch. *I* propose to copy myself through and see what's at the other side of the wormhole; what's more, I'm going to suspend myself on this side and hand over to whichever instance of me comes back, unless there's a long hiatus. How long, I haven't decided yet. Are you guys happy to join me?"

Pierre stands behind her throne, hands on the back: looking down over her head, at the cat in her lap, he's sure he sees it narrow its eyes at him. *Funny,* he thinks: *we're talking about jumping down a rabbit hole and trusting whoever lives at the other end with our personalities. After seeing the Wunch. Does this make sense?*

"Forgive, please, but am not stupid," says Boris. "This is Fermi-paradox territory, no? Instantaneous network exists, is traversable, with bandwidth adequate for human-equivalent minds. Where are alien visitors, in history? Must be overriding *reason* for absence. Think will wait here and see what comes back. *Then* make up mind to drink the poison Kool-Aid."

"I've got half a mind to transmit myself through without backup," says someone else—Angus— "but that's okay: half a mind is all we've got the bandwidth for." Half-hearted laughter shores up his wisecrack, supports a flagging determination to press through.

"I'm—with Boris," says Su Ang. She glances at Pierre, catches his eye: suddenly a number of things become clear to him, crystal-clear. He shakes his head minutely. *You never had a chance: I belong to Amber;* he thinks, but deletes the thought before he can send it to her. Maybe in another instantiation his issues with the queen's *droit du seigneur* would have bulked up larger, splintered his determination; maybe in another world, it has already happened? "I think this is very rash," she says in a hurry. "We don't know enough about post-singularity civilizations."

"It's not a singularity," Amber says waspishly. "It's just a brief burst of acceleration. Like cosmological expansion."

"Smooths out inhomogeneities in the initial structure of consciousness," purrs the cat. "Don't I get a vote?"

"You do," Amber sighs. She glances round. "Pierre?"

Heart in his mouth: "I'm with you."

She smiles, brilliantly. "Well, then. Will the nay-sayers please leave the universe?"

Suddenly, the audience chamber is half-empty.

"I'm setting a watchdog timer for a billion seconds into the future, to restart us from this point if the router doesn't send anyone back in the inter-

vening time," she announces gravely, taking in the serious-faced avatars of those who remain. Surprised: "Sadeq! I didn't think this was your type of—"

He doesn't smile. "Would I be true to my faith if I wasn't prepared to bring the words of Mohammed, peace be unto him, to those who may never have heard his name?"

Amber nods. "I guess."

"Do it," Pierre says urgently. "You can't keep putting it off forever."

Aineko raises her head. "Spoilsport!"

"Okay." Amber nods. "Let's *do*—"

She punches an imaginary switch, and time stops.

At the far end of a wormhole, two hundred light years distant in real space, coherent photons begin to dance a story of human identity before the sensoria of those who watch. And all is at peace in orbit around Hyundai +4904/-56 . . . for a while. . . . ❍

BEFORE WE HIT BOTTOM

Before we hit bottom, let us consider that
Falling, our clocks run slow, but
Only if someone else looks at them.

Let us also consider that
The rat does not know he is in a maze,
Only that the world smells like cheese he can't see.

—Alex Irvine

On Books

Peter Heck

TRANSCENSION
by Damien Broderick
Tor, $25.95
ISBN: 0-312-30369-9

Broderick has been doing good work for ages without ever making the breakthrough into broader recognition. Here's a book that ought to put him prominently on the map.

The main plot revolves around two "young" characters from contrasting societies. Amanda is a talented but rebellious "pender" from an affluent high-tech society where full adulthood is granted only at age thirty. She speaks in a clipped teenage jargon, plays the violin at virtuoso level, and seeks status among her peers by planning increasingly dangerous stunts. Already in her late twenties, she seems far less mature than Mathewmark, a teenager from a rural society founded by religious fanatics who opted out of participation in the utopian society of which Amanda is a member. Mathewmark spends his days doing farm chores, driving a mule to make deliveries around the valley, and pining for Sweetcharity, the daughter of a respected religious elder. His fondest dreams are of eventual marriage to her.

The two come into contact when an elaborate stunt by Amanda and one of her young friends requires them to gain entry into the normally off-limits reservation. Using her computer skills, Amanda takes control of a "liar bee," an advertising drone, that she sends to convince Mathewmark and his brother Lukenjohn to help them. The stunt ends, perhaps inevitably, in disaster. Mathewmark is seriously injured, and Amanda finds herself facing serious criminal charges.

The judge who decides Amanda's case is, in fact, a remnant of an earlier era, a computer scientist whose research into artificial intelligence helped make possible the Aleph—the massive computer network that regulates society. Revived from cryogenic sleep (centuries after his death at the hands of a gang of juvenile delinquents), Abdel Malik is at once the direct embodiment of the Aleph's mind, and a maverick judge who often finds unexpected ways to administer justice. Looking at the facts in Amanda's case, he arrives at the conclusion that her rehabilitation would best be served by taking charge of Mathewmark after his release from the hospital, where he has had a computer chip implanted in his head to replace injured parts of his brain. But while the chip saves Mathewmark's life, its presence violates the principles on which his homeland was founded, and the elders inform him that he cannot come back. Inevitably, this decree starts Amanda scheming up ways to enable him to return.

At this point, Broderick shifts away from what had been developing as a characteristic (if engagingly witty) satiric novel of rebellion and maturity. Many experienced readers will have been anticipating some kind of synthesis of the values of the two opposed societies, a solution that by now is pretty much a cliché. But here, the reader gradually becomes aware that he is reading a

different *kind* of book from what Broderick has led him to expect. At the end, without entirely abandoning the expectations laid down by earlier chapters, the author finds a new way to combine the familiar patterns, and builds to a conclusion that can only be described as lyrical.

A tour de force; highly recommended.

THE PESHAWAR LANCERS
by S.M. Stirling
Roc, $23.95
ISBN: 0-451-45848-6

Here's an alternate history based on the assumption that a series of comet impacts in the mid-nineteenth century forced the British empire to relocate the center of its government to India. A century later, we find the descendants of Victoria reigning over a twenty-first century empire that bears a closer resemblance to a Kipling story than to anything in recent history.

The story is told from multiple points of view, but a central figure is Aethelstane King, a cavalry captain in the border-patrolling military unit for which the book is named. We encounter him on his return from an expedition against Afghan tribes who may be under the influence of Russia—England's ancient rival in Asia, and (since the catastrophe) a nation of death-worshipers who seek nothing less than the extinction of all life. On the way home, King survives two assassination attempts, and in the process acquires the services of Ibrahim Khan, a roguish Pathan whom he decides to trust despite Khan's having attempted to stick a knife between his ribs. Now it becomes clear that a powerful Russian plot to overthrow the empire is in motion—and that behind it is a particularly dangerous secret agent. To combat the threat, Captain King, with his new servant and his long-time adjutant, Narayan Singh, takes off on a secret journey to the capital.

At almost the same time, King's sister Cassandra, a prominent astronomer, survives a terrorist attack that kills one of her colleagues and nearly destroys a new state-of-the-art telescope mirror. As a second line of defense against the looming Russian threat to the empire, Cassandra goes to the imperial court in Delhi, to keep an eye on the royal princess, a bright young woman with a mind very much her own. The latter trait has been particularly evident since the arrival of emissaries from the French court, currently ruling from Algeria, who have come to arrange a marriage between the two leading dynasties of Europe in exile.

Stirling uses the multiple points of view to examine his Anglo-Indian alternate world on several levels, cutting back and forth from Captain King's adventure-filled journey to his sister's equally colorful experiences in the royal court. As fans of alternate history have come to expect, there are a number of entertaining crossovers from our own timeline to that of the novel. Particularly provocative is the setting of the finale in the wild country of Afghanistan, a scenario Stirling could hardly have known at the time he was writing the book was going to become particularly familiar to his readers. Solid world building, melded to a plot full of twists and tension—another strong work by Stirling.

WHOLE WIDE WORLD
by Paul McAuley
Tor, $24.95
ISBN: 0-765-30392-2

McAuley takes us to a not-so-far-future London, with a jaded police officer as his protagonist. Sent to help out with a murder investigation, the cop (his name, we eventual-

ly learn, is John Dixon, although almost nobody calls him that) runs into a hostile detective inspector, Varnom, who holds a grudge against him for an episode in which several other officers were killed, and who rags him for being too casually dressed (although Dixon was sent to the scene while jogging in the park on his day off). The cop shrugs, takes charge of the computer he was sent to secure, and goes on his way.

But the murder—a young girl, an art student whose torture and death were broadcast over her own webcams—preys on Dixon's mind. He makes it a point to follow up the investigation of the computers taken in evidence from her apartment. The lead investigator, McArdle, recognizes that the computer evidence may be a key to the case, and allows him to take part in spite of Varnom's objections. Several clues emerge early on that make it fairly clear that the victim's computer—from which several vital components have been removed—is a key to the crime. And while Dixon discovers one strong suspect early on, that suspect turns out to have an apparently ironclad alibi—airport security cameras spotted him leaving the country shortly before the murder.

That brings up a significant feature of the society in which this novel is set: the almost universal presence of surveillance cameras in public (and in many private) places. Such cameras are already in widespread use in England, and are being proposed for the Washington, D.C., area—so the future of this book may well be one that many readers will be living in. Not surprisingly, as Varnom already recognizes, Dixon is enough of a maverick not to be entirely comfortable in the constant presence of Big Brother. So when the murder victim turns out to be a niece of the man who developed ADESS, the software that makes state surveillance practical, Dixon's interest is understandably piqued.

McAuley uses the murder investigation to give direction to his tour of a society considerably more repressive than the present day, although not an unreasonable extrapolation from current trends. The government of Britain has become obsessed with protecting its citizens from sex and violence in the media, a policy doomed almost at once to failure given the ubiquitous reach of the web. Dixon summarizes the tension between law and the standards of society in the very first scene, where he is wearing an "Information wants to be free" T-shirt—it is this article of clothing that almost at once draws unfavorable comment from Varnom, spokesman for the establishment.

As is the norm in noir detective stories, the atmosphere grows increasingly paranoid, and Dixon finds himself increasingly isolated. Varnom has powerful allies, who seem determined to look in every direction except the ones uncovered by the protagonist. At the end, Dixon is forced to go on a wildcat expedition to confront the wrongdoers on their own turf. While none of this is a radical departure from the norm of the detective genre, McAuley's handling of it is utterly professional, with a generous quota of surprises at the end, and a conclusion that SF-minded readers will find satisfactorily rooted in the premises of the story.

VITALS
by Greg Bear
Del Rey, $24.95
ISBN: 0-345-43528-1

With *Darwin's Radio,* Bear appeared to have returned to the near-future biological themes that around the time of the influential *Blood Music* seemed to be his particular forte;

this book continues that trend. It also continues the move toward the mainstream audience that some remarked on in *Darwin's Radio*—I note that the jacket copy carefully avoids any overt mention that the book might be science fiction, and three of the four blurbs label it a "thriller." Even the publisher's logo on the spine is printed in a tastefully unobtrusive shade, as if to downplay the fact that the book comes from a science fiction house.

Hal Cousins is a scientist working on the cutting edge of research into human aging, scrambling for funding from the small group of superrich men and women willing to pay vast sums to insure their own longevity. Now it looks as if he's hit the jackpot, with a multimillionaire client convinced that Hal's methods offer the kind of promise he's been looking for. But on a submarine expedition to recover deep-water biological specimens, everything breaks down; the pilot apparently goes mad, and when Cousins (guiding the submersible himself) manages to return to the surface, he discovers that several other scientists and crew members have been murdered. Profoundly discredited, he finds his funding cut off—and suddenly, he is on the run from some unknown killers.

At this point, he links up with a mysterious figure calling himself K, who drops broad hints of a vast conspiracy that dates back to the heyday of Stalin's most terrifying biological experiments. Somewhere in the bizarre puzzle is a key to the death of Hal's twin brother Rob, another biologist working along similar lines until his murder in New York.

On the edge of some apparent revelation, Bear deftly cuts away to the story of another character, a retired military man named Ben Bridger, who turns out to have known Rob Cousins in the days leading to his death. The suspense again begins to build, with more connections starting to form, as the reader gets a different look at some of the same characters and events already revealed. Bear keeps the characters (and the reader) guessing at the ultimate nature of the menace, so that when it finally comes to light, it is both a surprise and a confirmation of suspicions already planted.

Bear effectively combines the menacing, hallucinatory landscape of the best thrillers with the strong scientific underpinnings of SF. And he has the pacing of the thriller down to a science here. A strong performance, which ought to bring him plenty of new fans—one hopes without losing his original audience, which will find plenty here to enjoy.

TRUE NAMES AND THE OPENING OF THE CYBERSPACE FRONTIER
by Vernor Vinge and Others
Edited by James Frenkel
Tor, $14.95 (TP)
ISBN: 0-312-86207-9

The 1981 novella that forms the centerpiece of this collection is already recognized as a classic: one of the first imaginative portrayals of what would eventually become known (in the term coined by William Gibson) as cyberspace. Vinge's use of the metaphor of magic to suggest the potential revolutionary power of the then-nascent internet has shaped the perceptions of almost every subsequent writer on the subject.

This volume provides not only the original text of "True Names," but a number of essays exploring the wider implications of Vinge's story, particularly in the areas of privacy and encryption. Contributors include Marvin Minsky (who wrote an afterword to the 1983 Blue Jay edition of the novella, reprinted here), Richard Stallman, John M. Ford,

Tim May, and others, some better known to those who follow cutting edge computer culture than to SF fans. The essays focus not so much on the story's literary value as on its impact on the computer culture and its foreshadowing of later developments in technology. Most readers will probably want to read these one or two at a shot, with time in between to absorb the points presented. Others may want to jump directly to the novella—although it is hard to imagine many readers not already familiar with it.

As Frenkel points out in an introduction, many of the essays here are several years old; given the speed of change (not to be confused with progress) in the computer world, this leaves some of them addressing issues long since resolved—or forgotten as more pressing questions came to the fore. Nor are all readers likely to agree on just who the good guys are in some of the debates. Most of the authors take it for granted that privacy and strong encryption are universal rights, and dismiss as a red herring the government's charge that they provide shelter for terrorists. Some might want to rethink that position in the wake of 9/11, if only to strengthen their arguments in the face of such events as the U.S. government's suppression of Osama bin Laden's videos on the grounds that they might contain steganographic messages to his followers. And, strong as the anti-authoritarian streak may be among the book's likely audience, there might have been room for a voice or two on the other side—although it would undoubtedly be hard to find many writers comfortable arguing the benefits of censorship as anything short of a regrettable necessity in the face of enemy action.

If nothing else, this is an excellent excuse to reread Vinge's novella, which holds up very well in a new millennium. And even the most blithely laissez-faire reader will find food for thought in the best of the accompanying essays.

THE UNIVERSE IN A NUTSHELL
by Stephen Hawking
Bantam, $35.00
ISBN: 0-553-80202-X

Hawking's last book for a general audience, *A Brief History of Time,* may have been the most widely unread bestseller in recent history. But despite all the quips to the contrary, its subject wasn't all that abstruse; anyone who'd kept up with recent physics and cosmology should have found Hawking's main points reasonably clear. Now Hawking is back with a book that ought to be even more widely accessible.

This one brings in various discoveries in the fourteen years since *Brief History,* with an eye toward what has been the Holy Grail of physics ever since Einstein's day, a single framework within which relativity and quantum theory can be understood as parts of a unified whole. It begins, logically enough, with a review of the key elements of the twentieth-century physical synthesis: general relativity, spacetime, quantum theory, the big bang, and the inflationary universe. There are plenty of illustrations to help the reader visualize the ideas under discussion—although some are clearly meant more for their entertainment value than for any clarification of the text.

The foundations having been established, Hawking is off in search of the next big thing in physics—with particular interest in the implications of superstring theory and of its latest extension, the notion of several parallel universes that exist on separate "branes" (a contraction of membranes, to suggest the concept's relation to "strings"). Here the

reader is in deeper water. Such concepts as a ten (or more!) dimensional universe, with some dimensions folded up so small that they're undetectable, are going to be very difficult for a nonmathematical reader to follow except on the most abstract level.

Still, Hawking offers a wealth of insights into how a top physicist looks at the universe, and many thought-provoking looks behind the surface of reality. Just what the ultimate structure of the universe might be remains tantalizingly out of reach, although some of the ideas in this book may turn out to be the keys to a new understanding. Well worth the price to anyone who wants to keep up with the currents of cosmological and physical speculation. ❍

To the Bat with the Broken Wing

Dear Bruce,

I have left you flash-frozen praying mantises spinning in the lazy Susan, leeches suffocating in the sugar bowl, grasshoppers, each with one broken leg writhing in the crystal gravy boat, indigo spiders jiggling on a silver tray of Crazy Glue, a fire ant farm damp with kerosene, and a licorice candle.

I have gone to the store for surgical tape and a kite.

Get well soon.

—Rebecca Lu Kiernan

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16–18—ConGlomeration. shadowr@iglou.com. Holiday Inn Lakeview, Clarksville IN (Louisville KY). D. Drake, A. Offutt.

16–18—ConTemplation. www.contemplation-inc.org. Ramada, Columbia MO. Angela Lowry, David Harris, Jeff Orth.

16–18—Fanex. (410) 665-1198. www.midmar.com/filmfest. Days Hotel, Timonium (Baltimore) MD. Horror film fest.

16–18—Trek Celebration. (913) 441-9405. www.sfedora.com. Doubletree, Arlington VA. Commercial Star Trek event.

16–18—Canadian Anthro & Cartooning Expo. www.c-ace.org. Courtyard Marriott Downtown, Ottawa ON. Furry fans.

16–19—2002: A Discworld Odyssey. (0709) 226-4571. www.dwcon.org. Hanover Int'l., Hinckley UK. Terry Pratchett.

21–25—Feral!, Box 47008, Mississauga ON L5K 1TP. www.campferal.org. Kinark Centre, Toronto ON. Furry camp.

23–25—BuboniCon, Box 37257, Albuquerque NM 87176. (505) 266-8905. HoJo East. E. Friesner, S. & J. Robinson.

23–25—ConDerosa, 5420 S. Lee, Oklahoma City OK 73109. (405) 682-5230. www.geocities.com/serizawa40/connews.

23–25—Horrorfind, 9722 Groff Mills Dr. #109, Owing Mills MD 21117. Airport Marriott, Baltimore MD. Horror film.

23–25—Anime Iowa, Box 5303, Coralville IA 52241. www.animeiowa.com. Collins Plaza, Cedar Rapids IA. Stan Sakai.

24–25—Sci Fi Expo & Toy Show, Box 941111, Plano TX 75094. (972) 578-0213. www.scifiexpo.com. Plano Center.

29–Sep. 1—France Nat'l. Con, c/o Alain le Bussy, 21 rue du Cimetiere, Esneux 4130, Belgium. Liege, Belgium.

29–Sep. 2—ConJose, Box 61363, Sunnyvale CA 94088. www.conjose.org. San Jose CA. The WorldCon. $180+.

30–Sep. 1—Festival of Fantastic Film, 96 Meadowgate Rd., Salford, Manchester M6 8EN, UK. (440161) 707-3747.

30–Sep. 1—Furmeet, Box 6001, St. Louis MO 63139. www.mephitfurmeet.org. Airport Holiday Inn, Memphis TN.

30–Sep. 2—DragonCon, Box 16459, Atlanta GA 30321. (770) 909-0115. Hyatt. Weis. Huge media, gaming & SF con.

30–Sep. 2—Anime Fest, 397 Dal-Rich Village #196, Richardson TX 75080. (972) 569-8995. Dallas TX.

31–Sep. 2—Anime Expo, 1733G S. Douglas Rd., Anaheim CA 92806. www.axny.com. Marriott Marquis, New York.

SEPTEMBER 2002

6–8—CopperCon, Box 62613, Phoenix AZ 85082. (480) 423-0649. www.coppercon.org. Embassy Suites No. Hambly.

7–8—Trek Celebration, 4623 Aminda, Shawnee Mission KS 66226. Phone/Web as above. Las Vegas NV. Shatner.

12–15—GateCon, Box 76108, Colorado Spgs. CO 80970. (719) 574-6427. www.gatecon.com. Vancouver BC. StarGate.

AUGUST 2003

28–Sep. 1—TorCon 3, Box 3, Stn. A, Toronto ON M5W 1A2. www.torcon3.on.ca. WorldCon. C$220/US$145.

SEPTEMBER 2004

2–6—Noreascon 4, Box 1010, Framingham MA 01701. www.noreascon.org. Boston MA. William Tenn. WorldCon. $120.

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