REMEMBERANCE

STEPHEN BAXTER

Like many of his colleagues here at the beginning of a new century, Brit-ish writer Stephen Baxter has been engaged for more than a decade now with the task of revitalizing and reinventing the "hard-science" story for a new generation of readers, producing work on the cutting edge of sci-ence which bristles with weird new ideas and often takes place against vistas of almost outrageously cosmic scope.

Baxter made his first sale to *Interzone* in 1987, and since then has become one of that magazine's most frequent contributors, as well as making sales to *Asimov's Science Fiction, Science Fiction Age, Analog, Zenith, New Worlds,* and elsewhere. He's one of the most prolific new writers in science fiction, and is rapidly becoming one of the most popular and acclaimed of them as well. In 2001, he appeared on the Final Hugo Ballot twice, and won both *Asimov's* Readers Award and *Analog's* Analytical Laboratory Award, one of the few writers ever to win both awards in the same year. Baxter's first novel, *Raft,* was released in 1991 to wide and enthusiastic response, and was rapidly followed by other well-received novels such as *Timelike Infinity, Anti-Ice, Flux,* and the H. G. Wells pastiche—a sequel to *The Time Machine—The Time Ships,* which won both the John W. Campbell Memorial Award and the Philip K. Dick Award. His other books include the novels *Voyage, Ti-tan, Moonseed, Mammoth, Book One: Silverhair, Manifold: Time, Manifold: Space, Evolution, Coalescent, Exultant, Transcendent,* and two novels in collaboration with Arthur C. Clarke, *The Light of Other Days* and *Time's Eye, a Time Odys-sey.* His short fiction has been collected in *Vacuum Diagrams: Stories of the Xeelee Sequence, Traces, and Hunters of Pangaea,* and he has released a chapbook novella, *Mayflower II.* His most recent books are the novels *Emperor* and *Resplendent,* and coming up is another new novel, *Conqueror.*

Baxter's Xeelee series is one of the most complex sequences in Space Opera, spanning millions of years of time as well as most of the galaxy, and bringing humans into contact (usually hostile contact) with dozens of alien races. Here, in a story that takes place early in the sequence, he points out that while it may be true that those who forget the past are doomed to re-peat it, you can't remember the past if you're not *allowed* to remember it...

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"I am the Rememberer," said the old man. "The last in a line centuries long. This is what was passed on to me, by those who remembered before me.

“Harry Gage was on Earth when the Squeem came...”

As he talked, Rhoda Voynet glanced around at her staff. Soldiers all, the planes of their faces bathed in golden Saturn light, they listened silently.

The old man was a Virtual, projected from a police station on Earth, and the sunlight that shone on his face was much stronger than the dimin-ished glow that reached this far orbit. Rhoda felt obscurely jealous of its warmth.

“Harry was born on Mars, in the Cydonia arcology. His great-grandparents were from Earth. There was a lot of that, in those days, before the Squeem. Everybody was mobile. Everything was opened up. Anything was possible.

“Harry’s parents brought him to Earth, a once-in-a-lifetime trip to meet great-grandma and grandpa. He never did get to see them.”

It had been the year 4874, nearly two centuries past. Harry Gage was ten years old.

And Earth was about to be conquered.

* * * *

The flitter bearing Harry Gage and his parents had tumbled out of the shimmering throat of the wormhole transit route from Mars to Earthport.

Harry peered out of the cramped cabin, looking for Earth. Mum sat beside him, a bookslate on her lap, and Dad sat opposite, grinning at Harry’s reaction. Harry would always remember these moments well.

Earthport was at one of the five gravitationally stable Lagrange points in the Earth-Moon system, leading the Moon in its orbit around Earth by sixty degrees. The flitter surged unhesitatingly through swarming traffic. From here, Earth was a swollen blue disk. Wormhole gates of all sizes drifted across the face of the planet, electric-blue sculptures of exotic negative-energy matter.

The final hop to Earth itself took only a few hours. Soon the old planet, pregnant and green, was approaching, as if surfacing. Huge fusion stations, constructed from ice moons, sparkled in orbit above green-blue oceans.

The planet itself was laced with lights, on land and sea. In the thin rim of atmosphere near the north pole, Harry could just make out the dull purple glow of an immense radiator beam, a diffuse refrigerating laser dumping a fraction of Earth’s waste heat into the endless sink of space.

Earth was visibly stable, healthy, recovered from the climate-collapse hor-rors

of the past, and managed by a confident mankind.

"Harry's flitter landed in New York," the Rememberer said. "A spaceship coming down in the middle of Manhattan. Imagine that!"

Harry and his parents emerged onto grass, a park, in the sunshine of a New York spring. Harry could see the shoulders of tall, very ancient sky-scrapers at the rim of the park, interlaced by darting flitters.

Dad raised his face to the sun and breathed deeply. "Mmm. Cherry blos-som and freshly cut grass. I love that smell."

Mum snorted. "We have cherry trees on Mars."

"Every human is allowed to be sentimental about a spring day in New York. It's our birthright. Look at those clouds, Harry. Aren't they beautiful?"

Harry looked up. The sky was laced by high, fluffy, dark clouds, fat with water, unlike any on Mars. And beyond the clouds he saw crawling points of light: the habitats and factories of near-Earth space. Harry was thrilled to the core.

But Mum closed her eyes. She was used to the pyramids and caverns of Mars, and could not believe that a thin layer of blue air could protect her from the rigors of space.

And as Harry peered up, he saw a line of light cut across the sky, scratched by a spark bright enough to cast faint shadows, even in the sunlight.

New Yorkers looked up, faintly concerned. This wasn't normal, then.

"It was the first strike of the Squeem," the Rememberer said. "Harry never forgot that moment. Well, you wouldn't, would you? It shaped his whole life."

Rhoda and her soldiers listened, trying to understand, trying to decide whether to believe him. Trying to decide what to do about it.

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While the old man rested, Rhoda let her staff resume other duties, but sum-moned Reg Kaser, her first officer.

In her cabin, she powered up her percolator, her one indulgence from her Iowa home. While it chugged and slurped and filled the cabin with sharp coffee scents, she faced her big picture window.

The *Jones* was a UN Navy corvette. It was locked in a languid orbit around

Rhea, second largest moon of Saturn. In fact, the *Jones* wasn't far from home; its home base was on Enceladus, another of Saturn's moons.

Rhea itself was unprepossessing, just another ball of dirty ice. But beyond it lay Saturn, where huge storms raged across an autumnal cloudscape, and the rings arched like gaudy artifacts, unreasonably sharp. The Saturn system was like a ponderous ballet, beautiful, peaceful, illuminated by distance-dimmed sunlight, and Rhoda could have watched it forever.

But it was Rhea she had come for. Within its icy carcass were pockets of salty water, kept liquid by the tidal kneading of Saturn and the other moons. That wasn't so special; there were similar buried lakes on many of Sol system's icy moons, even Enceladus.

But within Rhea's deep lakes had been discovered colonies of Squeem, the aquatic group-mind organisms that had, for a few decades, ruled over a conquered mankind, and even occupied Earth itself. The *Jones* was named for the hero who had crucially gained an advantage over the Squeem, a bit of bravery and ingenuity which had ultimately led to the Squeem's expulsion from Sol system—or so everybody had thought, until this relic colony had been discovered. The xenologists were already talking to these stranded Squeem, using antique occupation-era transla-tion devices.

It was Rhoda's task to decide what to do with them. She could have them preserved, even brought back to Earth.

Or she could make sure that every last Squeem in Rhea died. She even had the authority to destroy the whole moon, if she chose, to make sure. She was promised the firepower. Weapons were Reg Kaser's department, and there were a lot of black projects around.

It was a hard decision to make.

And now she had the complication of this old man, the self-styled "Re-memberer," and his antique saga of the occupation, which he insisted had to be heard before any decision was made about the Squeem on Rhea.

First Officer Reg Kaser waited silently as she gathered her thoughts.

They were contrasting types. Rhoda Voynet, forty years old, came from an academic background; she had trained as a historian of the occupation before joining the service. Kaser, fifty, scarred, one leg prosthetic, and with a thick Mercury-mine accent, was a career soldier. He had taken part in the counterinvasion a decade ago, when human ships, powered by hyperdrive purloined from the Squeem themselves, had at last assaulted the Squeem's own homeworld.

They worked well together, their backgrounds and skills complementary. Kaser had learned to be patient while Rhoda thought things through. And she had learned to appreciate his decisiveness, hardened in battle.

"Tell me what we know of this old man," she said.

Kaser checked over a slate. "His name is Karl Hume. Born and raised on Earth. Seventy-four years old. He's spent his life working for the UN Res-toration Agency. Literature section."

Rhoda understood the work well enough. Much of the material she had drawn on in her own research had come from the Restoration's reassembling. The Squeem were traders, not ideological conquerors, but in their exploitation they had carelessly done huge damage to mankind's cultural heritage. A hundred and fifty years after their expulsion, the Restoration was still patiently piecing together lost libraries, recovering works of art, even rebuilding shattered cities brick by brick, like New York, where young Harry Gage had watched the sky fall.

"Hume was a drone," Kaser said, uncompromising. "His work was pa-tient, thorough, reliable, but he had no specific talent, and he didn't climb the ladder. He held down a job, all his life. But nobody missed him when he retired. He had a family of his own. Wife now dead, kids off-Earth. He never troubled the authorities, not so much as a dodgy tax payment."

"Until he tried to abduct a kid."

"Quite."

The boy, called Lonnie Tekinene, was another New Yorker, ten years old—the same age as Harry Gage, Rhoda noted absently, when he had wit-nessed the Squeem invasion. Hume had made contact with the kid through a Virtual playworld, and had met him physically in Central Park, and had tried to take him off to Hume's apartment. Alert parents had put a stop to that.

As Hume had been processed through the legal system, he had become aware of the discovery of the pocket of Squeem on Rhea, moon of Saturn, and the deliberation going on within the UN and its military arm as to what to do about it.

Kaser said, "Hume didn't harm a hair of the kid's head. At first, he just denied everything. But when he heard about Rhea, he opened up. He said it was just that his 'time' had come. He was the 'Rememberer' of his gen-eration. But he was growing old. He needed to recruit another to take his place—just as he was recruited in his turn by some other old fossil when *he* was ten."

"He never explained why he chose this kid, this Lonnie. What criteria he used."

Kaser shrugged. “On the other hand, looking at the police files, I don’t think anybody asked. Hume was just a nut, to them. A sexual deviant, maybe.”

Rhoda said, “And he insisted we have to hear what he has to say. Some truth about the Squeem occupation, preserved only in his head, that will shape our decision.”

“But we know all about the occupation,” Kaser said. “It was a system-wide event. It affected all of mankind. What ‘truth’ can this old fool have, locked up in his head, and available nowhere else?”

“What truth so hideous,” Rhoda wondered, “that it could *only* be lodged in one man’s head? What do you think we should do?”

Kaser shrugged. “Assess the Squeem colony on its own merits. Maybe they’re just stranded, left behind in the evacuation. Or this may be a moni-toring station of some kind, spying on a system they lost. Maybe it even predates the occupation, a forward base to gather intelligence to run the invasion. Either way, it needs to be shut down.”

“But the Squeem themselves don’t necessarily need to be eliminated.”

“True.”

“You think I should just ignore the old man, don’t you?”

He grinned, tolerant. “Yes. But you won’t. You’re an obsessive fact-gatherer. Well, we have time. The Squeem aren’t going anywhere.” He stood up. “I’ll see if the old guy has finished his nap.”

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Karl Hume, bathed in strong Earth sunlight, spoke of memories passed down through a chain of Rememberers: the memories of ten-year-old Harry Gage.

Before the invasion, humans had diffused out through Sol system and beyond in their bulky, ponderous, slower-than-light GUTships. It was a time of optimism, of hope, of expansion into an unlimited future.

Then the first extrasolar intelligence was encountered, somewhere among the stars.

Only a few years after first contact, Squeem ships burst into Sol system, in a shower of exotic particles and lurid publicity. The Squeem were aquatic group-mind multiple creatures. They crossed the stars using a hyperdrive system beyond human

understanding. They maintained an interstellar network of trading colonies. Their human label, a not very respectful rendering of the Squeem's own sonic rendering of their title for themselves—*"Ss-chh-eemnh"*—meant something like the Wise Folk, rather like *"Homo sapiens."*

Communication with the Squeem was utterly unlike anything envis-aged before their arrival. The Squeem didn't count in whole numbers, for instance. But eventually, common ground was found. And despite fears that mankind might be overwhelmed by a more technically advanced civiliza-tion, trade and cultural contacts were initiated.

Then, in orbit around every inhabited world and moon in Sol system, hyperdrive cannon platforms appeared.

And on Earth, rocks began to fall.

"They came in too fast for the planet's impactor defenses to cope with," the Rememberer whispered. "Rocks from Sol system's own belts of aster-oids and comets, sent in at faster than interplanetary speeds. Obviously it was the Squeem's doing.

"And they were targeted.

"Harry and his family, stranded on Earth, got an hour's warning of the Manhattan bolide. Harry's father knew New York. He got Harry off the island through the ancient Queens-Midtown Tunnel.

"The bolide came down right on top of Grand Central Station.

"The impact was equivalent to a several-kiloton explosion. It dug out a crater twenty meters across. Every building south of Harlem was reduced to rubble, and several hundred thousand people were killed, through that one impact alone, on the first day of the invasion. Harry saw it all.

"And Harry's mother didn't make it. Crushed in the stampede for the tunnels. Harry never forgave the Squeem for that. Well, you wouldn't, would you?"

Harry and his father made it to Queens, where a refugee camp was quickly organized.

And the world churned. All Earth's continents were pocked by the impact scars. Millions had died, cities shaken to rubble.

But the damage could have been far worse. The Squeem could have sent in a dinosaur killer. They could have put Earth through an extinction event, just as easily.

“It took a day for their true strategy to be revealed,” the Rememberer said. “When people started dying, in great numbers, in waves that spread out like ripples from the impact craters. Of diseases that didn’t even have names.”

The impactors had been carefully selected. They were all bits of Earth, knocked into space by massive natural impacts in the deep past, and so well preserved that they even carried a cargo of antique life. Spores, still viable.

“Diseases older than grass,” the Rememberer whispered, “against which mankind, indeed the modern biosphere, had no defense. They used our own history against us, to cut us back while preserving the Earth itself. Harry lost his father to the plagues. He didn’t forgive the Squeem for that either.”

Rhoda Voynet listened to this account. She was familiar with the history Hume had outlined so far, at least in summary. It was eerie, though, to hear this tale of immense disaster, eyewitnessed at only a few removes.

The Squeem attack must have been overwhelming, horrifying, for those who lived through it. Incomprehensible in its crudity and brutality.

But since those days, mankind had learned more of the facts of galactic life.

This was the way interstellar war was waged. It wasn’t like human war. It wasn’t politics, or economics. Though both mankind and Squeem were sentient tool-using species, the conflict between them was much more fun-damental than that. It wasn’t even ecological, the displacement of one spe-cies by another. This was a clash of biospheres.

In such a war, there was no negotiation. You just hit hard, and fast.

Surrender was inevitable.

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The Squeem moved quickly.

On Earth, residual resistance imploded quickly.

The more marginal colonies on other planets were subdued even more easily. Harry’s home arcology in Cydonia was cracked open like an egg. He never knew about that.

And human space travel was suspended. Wherever the great GUTship interplanetary freighters landed, they were broken up, and the Poole worm-hole fast-transit routes were collapsed. Some spaceborne humanity escaped, or hid. Pilots couldn’t bear to be grounded. Harry’s great-aunt Anna, an

AntiSenescence-preserved freighter pilot on the Port Sol run, managed to escape Sol system altogether. Harry never knew about that either. In fact, he never saw any of his family again.

Harry Gage, ten years old when the rocks fell, orphaned in the first few days of the invasion, was a Martian boy stranded on Earth.

He was put to work. In the first weeks, he had to help lug the bodies of plague victims to vast pyres. He always wondered if one of them was his own father. Later, he worked on the construction of labor camps, in the ruins of the shattered cities of mankind.

He grew older and stronger, working hard for the Squeem and their human collaborators, as the aliens began to exploit the worlds they had conquered.

The Squeem had no interest in human technology, too primitive to be useful, still less in the products of human culture. But Earth still had lodes of complex hydrocarbons. The last of the planet's oil and coal was dug up by human muscle, and exported off the planet. Harry worked in the mines, squirming through seams too narrow for an adult.

And some products of Earth's biosphere proved useful for the Squeem, not the bugs or plants or animals themselves, but aspects of their exotic biochemistry. So Harry worked on tramp ships harvesting plankton, and in vast fields of swaying grasses.

Humans themselves could be worth exporting, though they were ex-pensive and fragile. Slave transports lifted off the planet, sundering families, taking their captives to unknown destinations. Even after the eventual ex-pulsion of the Squeem, nobody ever found out what became of them.

And people kept dying, from overwork or hunger or neglect.

The Squeem even shut down AntiSenescence technology. They had no interest in lengthening human lives; fast-breeding generations of servants and slaves were sufficient for them.

Stone-age wars were fought over the last AS supplies. Some of the undy-ing went into hiding, detaching themselves from human history. And other lives centuries old were curtailed in brief agonies of withdrawal.

Amid all this, Harry grew up as best he could. There was no education, nothing but what you could pick up from other workers, and bits of Squeem-collaborator propaganda, about how this wasn't a conquest at all but a necessary *integration* of mankind into a galactic culture. Harry heard little and understood less.

“But,” Karl Hume whispered, “Harry never forgave the Squeem, for their murder of his mother and father. And he began to develop contacts with others who were just as unforgiving. It was a dangerous business. There were plenty of collaborators, and the dissident groups were easily infiltrated.

“But a resistance network gradually coalesced. Small acts of sabotage were committed. Every act was punished a hundredfold. But still they fought back, despite the odds, despite the cost. It was a heroic time.”

Lots of untold stories, historian Rhoda thought wistfully.

“Then,” said the Rememberer, “Harry was transferred to the Great Lakes.”

Lake Superior had the largest surface area of any freshwater lake in the world. It was a grandiose gesture of the Squeem to colonize this great body of water, to symbolize their subjugation of mankind. Harry worked on vast projects to adjust the mineral content of Superior’s water to the Squeem’s liking, incidentally eliminating much of the native fauna. Then the Squeem descended from the sky in whalelike shuttles.

It was the Superior colony which gave the resistance a real chance to hurt the Squeem.

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Rhoda Voynet grew more interested. At last, the Rememberer was talking of incidents she’d never heard of before.

It was easy to kill a Squeem, if you could get near one, as easy as murder-ing a goldfish. But all Squeem were linked into a mass mind. So the death of a single Squeem affected the totality, but only in a minor way, as the loss of a single neurone from a human brain wouldn’t even be noticed. To hurt the Squeem significantly, you had to kill an awful lot of them.

And that was what Harry’s resistance cell managed to do. It happened close to Harry’s twenty-fifth birthday.

“It was a suicide mission,” the Rememberer said. “A volunteer allowed her body to be pumped full of Squeem-specific toxins and pathogens. Harry wasn’t the assassin, and neither was he educated enough to have manufac-tured the toxins. Cells of fifty-somethings, the last generation of preinvasion scientists, labored over that. But Harry was a link in the chain that got the toxins to the assassin, and he helped provide a diversion that enabled the woman to finish the job.”

The woman just jumped into Lake Superior, one bright morning, her body

weighted with bags of rocks. She slit her own wrists, and cut her throat, and let her crimson blood spill into the crystal waters.

“Every Lethe-spawned Squeem in that lake died,” Karl Hume said. “They felt it all the way back to their homeworld.”

Rhoda saw Reg Kaser clench his fist, the others of her crew shift and murmur. Subtle signs of triumph. It was a story that none of them had heard before; Rhoda, herself a historian, had no idea the invasion-age inhabitants of Earth had been able to mount such an effective assault on the Squeem.

“But of course, it made no difference to the occupation,” Hume said. “The Squeem still had Sol system. They still had the Earth. They rounded up everybody even remotely connected with the killing.”

“They got Harry,” Kaser said.

“Oh, yes. And they put them all in a prison camp, where Harry waited for Earth’s punishment.

“To understand what followed,” Hume said darkly “you have to try to see the worldview of the Squeem. For one thing, they aren’t instinctive killers, as we are. Their background is a cooperative ecology, not a competitive one, unlike ours. That’s how they ended up as a group mind. When they did kill, as in the strikes on the cities, the killing was minimal—if you can call it that—just enough to achieve their objectives, in that case to shatter resistance and subjugate.

“We on the other hand had ‘murdered’ Lake Superior, in their view. We had rendered a whole body of water uninhabitable. They are aquatic, re-member. To them it’s as great a crime as if we destroyed an entire world.

“And so they planned a punishment appropriate to the crime they per-ceived.”

In the silent skies above Harry’s prison, ships slid into position. Beams of pinkish light connected them, and pulsed down into the ground. It took a full year to assemble the network.

“And when it was ready—”

“Yes?” Rhoda asked, breathless.

“Water is funny stuff,” the Rememberer said. “Have you ever heard of hot ice?”

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Rhoda had her engineering officers extrapolate what had happened, from the hints in Hume's account.

Ice formed naturally when heat was extracted from a body of water, the hydrogen-oxygen molecules settling into a space-filling solid lattice. But the Squeem had discovered that you can create a particular kind of ice, called polar cubic ice, even at high temperatures, with electricity.

"We know about this too," Reg Kaser said. "All you have to do is pass an electric field through the water—a strong one, a million volts a meter. The two hydrogen atoms in a water molecule have a slight positive charge, and the oxygen atom a negative one, so the electric field makes the molecules line up like fence posts. And there you have it, ice, at as high a temperature as you like. This happens in nature, though on a microscopic scale, wherever there are strong enough electric fields. Such as across the membranes of nerve cells, or in the cavities of proteins. Mini-icebergs riding around inside your cells. Amazing."

Hume said, "The Squeem were masters of this sort of technology. Mas-ters of *water!'*

"And so," Rhoda prompted, "on occupied Earth—"

"They froze the water."

"What water?"

"All of it."

Earth's oceans plated over with ice, right down to the equator, and then froze to their beds. And then the hard whiteness crept up the river valleys.

Harry and his codissidents were made to watch, on vast softscreens. Indeed, the Squeem made everybody watch, everybody capable of under-standing

"Even the aquifers froze. Even the moisture in the ground," Hume whispered. "Everybody walked around on permafrost, down to the equator.

"The Squeem controlled it, somehow. After all, humans are just big bags of water. We didn't freeze, nor did the grasses, the animals, the birds, the moisture in the air. Of course, rainfall was screwed, because nothing was evaporating from the oceans.

"They kept it up for a full year. By then, people were dying of the drought and the cold. And Earth blazed white, a symbol of the Squeem's dominance, visible even to all the off-planet refugees and hideouts, visible light-years away.

“Then they released the field. There was a lot of damage as all that ice went away. Coastlines shattered, river valleys gouged out, meltwater floods, climatic horrors. Lots of people died, as usual.

“And the oceans were left sterile. Oh, the Squeem allowed gradual re-stocking, from samples in climate-crash gene-store facilities, that kind of thing. The oceans didn’t stay dead. But still, what followed would always be artificial. The link with the deepest past of life on Earth was cut.

“It was the worst act the Squeem, an aquatic species, could think of,” Hume said. “To murder oceans. They thought it would crush human resis-tance once and for all. And it worked. But not for the reasons they imag-ined.”

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“When it was done, they just let Harry and his colleagues go. Harry came out of that prison camp near Thunder Bay, and found himself in an aftermath society.

“It had been by far the worst act of terror ever inflicted on the Earth, by mankind or anybody else.

“And it had cut through some deep umbilical connection we still evi-dently had with the mother oceans. We came from the oceans. Our deepest cellular origins lie there. When hominids arose, even before we were intel-ligent, we used the water, river courses and ocean shores, as roadways as we covered the planet. Now all that was gone. Everybody just wandered around stunned.”

“I’m not surprised,” said Rhoda. She assessed the reactions of her crew to this forgotten crime. Anger, shock, a lust for revenge.

“And,” Hume said now, “the Squeem became concerned. A large pro-portion of mankind was plagued by flashbacks, crippling fear. Productivity was dropping. Birth rates falling. They didn’t want to kill off their cheap labor. Maybe they saw they’d gone too far.

“World leaders were summoned to a kind of summit. I say leaders. After two decades of the Squeem, there were no presidents, no UN secretary-general. The ‘leaders’ were labor organizers, necessary academics like doc-tors, a few religious types.

“And the Squeem offered, not a restoration, for what they had done could not be put right, but a kind of cure.”

Most of humanity was suffering from a deep kind of post-traumatic stress disorder.

The memories of the freezing were etched deeply into every human brain. Like all traumas, the event had produced a rush of adrenaline and noradrenaline, which then forced a brain center called the amygdala to imprint the memories into the hippocampus, the memory center, very deeply. It was essentially a survival mechanism, so that any reminder of the event triggered deep memories and a fast response.

Sometimes such memories were gradually extinguished, the memory pathways overridden if not erased. But in this case, for the majority of man-kind, the extinguishing mechanism didn't work well. The event had been too huge, too deep. And global post-trauma stress was the result.

But this could be rectified.

"There are ways to control memory formation," Reg Kaser murmured to Rhoda, taking another briefing from his data slate. "Drugs like beta blockers that inhibit the action of adrenaline and noradrenaline, and so reduce their memory-forming capabilities. A stress-related hormone called cortisol can inhibit memory retrieval. There are drugs that release a brain chemical called glutamate that enhances learning, thereby accelerating the normal memory extinguishing process. And so on."

"You're talking about altering memories with drugs," Rhoda murmured.

"Since the twentieth century, when neuroscience was established as a discipline, human societies have always shied away from memory-changing technology," Kaser said. "There are obvious ethical issues. A memory is part of your identity, after all. Does anybody else have the right to take away part of *you?* And suppose a criminal deliberately erases all her own memory of her crime. If she doesn't remember it, is she any longer responsible? That was used as a defense in a criminal trial during—"

"Never mind," Rhoda said.

"The point is, such technologies have existed in the past. And after a couple of decades of occupation, the Squeem, presumably with human col-laborators, were able to come up with a suitable treatment."

"Yes. And this is what they offered us," Hume said. "An engineered virus that would spread through mankind, across the Earth. Eventually moles would carry it through the off-planet populations too. It wouldn't be comfortable. You would have a nightmare, reliving the trauma one last time. But that would make the memory labile again for a short time. And so it could be treated."

"They would delete the memory of the freezing, of this vast crime," Rhoda said. "From everybody's heads."

“That was the idea. There would have to be a subsidiary activity of remov-ing it from various records, but there weren’t too many marine biologists at the height of the occupation. It wouldn’t be difficult.

“This solution served the Squeem’s goals, you see. People would stay pli-able. They just wouldn’t know why.”

Kaser said sharply, “And, since none of us have heard of this freezing before, I take it that these ‘leaders’ made this supine choice on behalf of the rest of mankind.”

“You shouldn’t judge them,” Hume said. “We had been enslaved from space, for decades already. They could see no way out. The only choice was between a future of terrified subjugation, or a calmer one—vague, baffled, adjusted.

“Even Harry Gage and his resistance colleagues knew they were beaten. They submitted. But,” he said, and a smile spread over his leathery face, “there was one last act of defiance.”

Everybody alive would forget the terror. Everybody but one.

* * * *

“It wasn’t sophisticated. They would just hide one person away, for a year, perhaps more. Earth’s a big planet. There were plenty of places to hide. And not all the biochemists had gone over to the Squeem. Some of them helped out with screens against the virus. And when he or she came out of her hole in the ground—”

Rhoda guessed, “Harry Gage was the first Rememberer.”

Hume smiled. “They chose him by lot. It could have been anyone. It’s the only reason we remember Harry now, the only extraordinary thing that happened in his life.

“He went into the hole without a word of protest. And when he came back out, he found himself the only one who remembered the freezing. A kind of living memorial to a deleted past.

“Harry just went back to work. But the course of the rest of his life was set out. It must have been hard for him, hard not to talk about what he knew. It’s been hard for *me,* and I didn’t live through it.

“Harry Gage died in his late forties. It wasn’t an age when people grew old. But he fulfilled his last mission, which was to transmit his memories to another.

“The Second Rememberer was in her thirties when the Squeem regime began to crumble—sooner than anybody had expected. She too died young. But she was able to pass on her knowledge to another in turn.

“And so it went. Two centuries after the Squeem conquered Earth, I am the Sixth Rememberer.”

Rhoda nodded. “And you tried to recruit Lonnie Tekinene.”

Hume sighed. “That was the idea. I left it a bit late in life to be befriend-ing ten-year-olds.”

“But,” Reg Kaser said, “even though the Squeem fell so long ago, none of you thought to reveal the truth of all this oral history until now.”

Hume shrugged. “When would have been right? Each of the Remem-berers has had to make that judgment. It was only when I learned of your pocket of Squeem, after the passage of two centuries, that I judged the time was right. You need to know the whole truth about the Squeem in order to deal with them.” His face twisted. “But I wasn’t *sure.* I’m still not.”

Rhoda said gently, “So how do you feel now?”

“Relieved. It’s a burden, to be the only one who knows.”

* * * *

It took Rhoda Voynet and her crew another week of data-gathering before she felt ready to make her judgment.

She called Reg Kaser to her cabin, and fired up her percolator once more. Beyond her picture window, Saturn turned, its cloudy face impassive before the turmoil of living things.

“They’ve started to find proof,” she said to Kaser.

“Of what?”

“The freezing. The geologists. The biologists, trawling the seabeds for crushed whale bones. My historian colleagues, finding traces of deleted re-cords. Global evidence of a decade-long glaciation event. It was always there, but unnoticed; it just needed a framing hypothesis to fit it all together.”

“So Hume was telling the truth.”

“It seems so.”

“Meanwhile,” Kaser said, “I’ve been talking to the xenologists, who have been in contact with those Squeem down there under the ice. The Squeem have been making their own case.”

“About what?”

“About why we should be lenient. The Squeem say they suffered some deep trauma of their own. After all, they are aquatic, they’re functionally fishlike, and it must have taken a huge disjunction to lift them out of their ocean and into space.” Kaser scrolled through notes on his slate. “Something about an invasion, by yet another world-conquering species. The Squeem managed to enslave the slavers, and started an empire of their own. Some-thing on those lines. It’s complicated.”

Rhoda said harshly, “And that justifies them occupying Earth?”

“I suppose that’s the argument. But you’re the commanding officer.”

“I am, aren’t I?” She looked him straight in the eye. “I want to know my options. Tell me about the weapon. The one that will destroy the moon.”

He looked away. “If you’re sure—this is need-to-know only.”

“I need to know.”

“It’s not a human development,” Kaser said. “Not even Squeem.”

Rhoda glanced beyond Saturn’s limb, at the stars. “Something hideous we’ve found. Out there.”

“Yes.”

Even under the oppressive Squeem occupation, humans had learned much.

They learned, for example, that much of the Squeem’s high technology—such as their hyperdrive—was not indigenous. It was copied, sometimes at second or third hand, based on the designs of an older, more powerful species.

“It was during the occupation,” Kaser said, “that the name ‘Xeelee’ en-tered human discourse. The primal source of all this good stuff.”

Rhoda shuddered. “And is this new weapon a Xeelee artifact?”

“It may be. Stuff gets swapped around out there. Purloined. Modified. We don’t know enough about the Xeelee to say.”

“Tell me what this thing does.”

“Maybe you know that the planet Jupiter is being destroyed. Eaten up from within by a swarm of black holes.”

“Yes.” In fact, Rhoda knew a little more about it than that.

“If we could make a black hole,” Kaser said, “we could throw it at Rhea and demolish it the same way.”

“We can’t make a black hole.”

“No. But we have a technology almost as good.” He pulled up graphics on his slate and showed her. “It’s a way to create a dark energy black hole.”

“A *what?”*

“It’s all to do with quantum physics,” he said.

“Oh, it would be...”

It was another kind of freezing, a phase transition. But this would happen at the quantum level. In a “quantum critical phase transition,” ordinary matter congealed into a kind of superconductor, and then into a sluggish stuff in which even subatomic fluctuations died, and mass-energy was shed.

“It’s as if time itself is freezing out,” Kaser said. He mimed with his hands. “So you have a spherical shell. Just a volume in space. You arrange for matter falling on its surface to go through this quantum phase transition. And as your infalling matter passes into the interior, its mass is dumped, converted to vacuum energy. Dark energy.”

“Why doesn’t this shell implode?”

“Because dark energy has a repulsive effect. Antigravity. Dark energy is already the dominant component of the universe’s mass-energy, and the antigravity force it produces will drive the expansion of the universe in the future. So I’m told by the physicists. Anyhow, the repulsion can balance the infall of matter.”

“It *can* balance.”

Kaser grinned. “That’s the engineering challenge, I guess. If you get it right, you get a stable object which externally looks just like a black hole. Inside, there’s no singularity, just a mush of dark energy, but any structure is destroyed just the same. These things are found in nature, apparently.”

“And they are easier to make than genuine black holes?”

“So it seems. You do need a big box of exotic matter, that is negative-energy matter, to make it work.” He kept grinning.

“Poole wormhole mouths.”

“Just the job. The Squeem wrecked the old Poole wormhole transport system, but they left the wormhole mouths in place. There are several still orbiting Saturn. Any one of them will do.”

“And if we throw one of these things into Rhea—”

“It will eat up the moon.”

“That would get rid of them,” Rhoda said.

“That it would. Of course, the Squeem may be useful. We could use them, as they once used us. A galaxy-spanning telepathic network—”

“We don’t need them in Sol system for that. We have their homeworld.”

“True.” Kaser eyed Rhoda. “The technology’s in place. The only ques-tion remains, do we use it?”

* * * *

Rhoda thought it through.

The Squeem occupation had changed human perceptions of the galaxy, and humanity’s place in it. A historic loss of innocence.

Now humans were tentatively moving out beyond Sol system once more. And everywhere they went, they found life. Intelligences swarming and squabbling. A kind of galactic society, a ramshackle pecking order based on avarice, theft, and the subjugation of junior races.

And for humanity, nothing but threat.

The black holes in Jupiter were clues to a closely guarded secret, which Rhoda hadn’t even shared with Reg Kaser. The Squeem invasion hadn’t been the first hostile alien incursion into Sol system. Some centuries back invaders called something like “Qax,” who would occupy Earth in their turn sometime in the future, had *come back in time* to secure their victory over mankind. In the course of the battle, miniature black holes had been hurled into Jupiter. During the Squeem occupation, knowledge of this event had mostly been lost, and was only now being

pieced back together by the historians. But the mortal wound inflicted on Jupiter was unarguable.

Some analysts, poring over the historical reconstructions, argued that the Qax invasion might be only decades away, in the future.

Even beyond the Qax, there was the apparent original source of much of the galaxy's technology (though nobody knew for sure): the Xeelee. Se-cretive, xenophobic, indifferent. And so far ahead, they made the rest of the galaxy's inhabitants look like tree dwellers.

The future held nothing but peril for mankind. Hierarchies of enemies. And that was the basis on which Rhoda must make her decision.

Rhoda stared down at the ice landscape of Rhea, imagining the stranded Squeem swarming within. "It won't be revenge," she said. "Call it insurance. Look what the Squeem did to us. This will be one danger eliminated."

"We're setting a course for the future, then."

"The future leaves us no choice. And if this makes us harder as a spe-cies, good. When the weapon's ready, send Hume up here, would you? He ought to watch this, as the Squeem made Harry Gage watch. Let *this* act be remembered too."

Kaser stood. "I'll call the weapons crew."

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