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# MOON SEED

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Stephen Baxter

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Venus has exploded. Showering Earth with radiation and bizarre particles that wipe out all the crops and half the life in the oceans. Suddenly, the ground itself begins melting into pools of dust that grow larger every day. For what has demolished Venus, and now threatens Earth itself, is part machine, part life-form – a nano-virus, dubbed Moonseed. Four scientists are all that stand between Moonseed and Earth's extinction, four brilliant minds that must race to cut off the virus and save what's left of the planet.

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**STEPHEN BAXTER**  
**MOONSEED**  
**THE NASA TRILOGY**



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## **DEDICATION**

For Sandra, with all my love



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## DRAMATIS PERSONAE

*Henry Meacher*, geologist, NASA

*Geena Bourne*, Space Station astronaut

*Jane Dundas*, shopkeeper

*Arkady Berezovoy*, Space Station astronaut

GREAT BRITAIN

EDINBURGH:

*Jack Dundas*, son of Jane

*Mike Dundas*, technician

*Ted Dundas*, retired police officer

*Ruth Clark*, neighbour of Ted Dundas

*Hamish Macrae*, aka Bran, cult leader

*Billy Macrae*, brother of Hamish

*Alan Macrae*, father of Hamish

*Dan McDiarmid*, geologist, Edinburgh University

*Marge Case*, geologist, Edinburgh University

*Constable Morag Decker*, police officer

*Blue Ishiguro*, geologist, USGS

*William MacEwen*, police superintendent

*Paula Romano*, Chief Constable

*Archie Ferguson*, Emergency Planning Officer

*Janice Docherty*, hospital patient

*Siobhan Reader*, Musselburgh Rest Centre manager

OTHER:

*Bob Farnes*, Prime Minister

*Dave Holland*, Environment Secretary

*Indira Bhide*, Home Secretary

*Debbie Sturrock*, firefighter, Dunbar

*William Calder*, *Jackie Brown*, rig workers

*Jenny Calder*, wife to William

UNITED STATES

NASA:

*Jays Malone*, Apollo astronaut

*Tom Barber*, Apollo astronaut

*Tracy Malone*, daughter to Jays

*Harry Maddicott*, JSC director

*Sixt Guth*, Space Station astronaut

*Bonnie Jones*, Space Station astronaut

*Frank Turtle*, engineer, JSC Solar System Exploration Division

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*Monica Beus*, physicist

*Alfred Synge*, astronomer

*Scott Coplon*, geologist, US Geological Survey

*Joely Stern*, e-zine journalist

*Cecilia Stanley*, e-zine editor

*David Petit*, chemist, Nobel Prize Winner

*Admiral Joan Bromwich*, Vice Chairman of Joint Chiefs of Staff

*Garry Beus*, son of Monica, USAF pilot

*Jake Parrish*, USAF pilot

JAPAN

*Declan Hague*, monk

LUNAR FEDERAL REPUBLIC:

*Nadezhda Pour-El Meacher Dundas*, astronaut

## I BIG WHACK

*It began in a moment of unimaginable violence, five billion years before humans walked the Earth.*

*There was a cloud, of gas and dust, slowly spinning. Much of it was the hydrogen and helium which had emerged from the Big Bang itself, but it was tainted by crystals of ice – ammonia, water and methane – and dust motes rich in iron, magnesium and silica, even some grains of pure metal. These were flotsam from older stars, stars already dead.*

*... And now another star died, a giant, in the conclusive spasm of supernova. A flood of energy and matter hammered into the cloud.*

*The cloud lost its stability, and began to collapse, to a spinning disc. The central mass shone cherry red, then gradually brightened to white, until – after a hundred million years – it burst into fusion life.*

*It was the protostar which would become the sun.*

*Within the disc, solid particles began to crystallize. There were grains of rock – silicate minerals called olivines and pyroxenes – and minerals of iron and nickel, kamacite and taenite. The particles, stuck together by melting ice, formed planetesimals, muddy lumps which swarmed on looping, irregular orbits around the sun.*

*The planetesimals collided.*

*Where an impact was head-on, the worldlets could be shattered. But where the collisions were gentle, the worldlets could nudge into each other, stick together, merge. Soon, some aggregations were large enough to draw in their smaller companions.*

*Thus, young Earth: a chaotic mixture of silicates, metals and trapped gases, cruising like a hungry shark in a thinning ring of worldlets.*

*Earth's bulk was warm, for the heat of accumulation and of supernova radioactive decay was trapped inside. The metals, heavier than the silicates, sank to the centre, and around the new, hot core, a rocky mantle gathered. Gases trapped in the core were driven out, and formed Earth's first atmosphere: a massive layer of hydrogen, helium, methane, water, nitrogen and other gases, amounting to ten per cent of Earth's total mass.*

*Earth's evolution continued, busily, logically.*

*But something massive was approaching.*

*'Look up, Tracy. Look at the Moon. You know, we take that damn thing for granted. But if it suddenly appeared in the sky, if it was Mercury hauled up here from the centre of the Solar System, my gosh, it would be the story of the century ...'*

*It was 1973.*

*Her father, Jays, had been back from the Moon only a couple of months. Tracy Malone, ten years old, thought he'd come back ... different.*

*'Look up,' he said again, and she obeyed, turning from his face to the Moon.*

*The face of the Man in the Moon glared down at Tracy. It was a composition of grey and white, flat and unchanging, hanging like a lantern in the muggy Houston sky.*

*'The Moon looks like a disc,' said her father, in his stiff school-teacher way. 'But it isn't. That's an optical illusion. It's a rocky world, a ball. You know that, don't you, sweet pea?'*

*Of course I know that. 'Yes, Dad.'*

*'People used to think the Moon was like the Earth. They gave those dark grey patches the names of oceans. Well, now we know they are seas of frozen lava. Think about that. And those brighter areas are the highlands, rocky and old. Now, look for the Man's right eye: you see it? That distinct circle? That's what we call the Mare Imbrium. It's actually one huge crater, big enough to swallow*

Texas. It was gouged out by a gigantic meteorite impact almost four billion years ago. What a sight that must have been.'

'But there was nobody around to watch it. Not even the dinosaurs.'

'That's right. And then, much later, it got flooded with basalt –'

'Where did Neil Armstrong land?'

'Look for the Man's left eye. See the way it's sort of sad and drooping? Follow that eye down and you come to Mare Tranquillitatis.'

'Tranquillity Base.'

'That's right. Neil put his LM down just by the Man's lower eyelid.'

'Can I see your crater?'

'No. Most craters are too small for people to see. But I can show you where it is. Look again at that big right eye. See the way the mare's grey extends beyond the circle, out of the Imbrium basin itself? That's Procellarum, the Ocean of Storms. That's where Apollo 12 landed, where Pete Conrad put his LM down right next to that old Surveyor. Well, my crater is on the border there, between Imbrium and Procellarum.'

'I can't see it.'

'It's called Aristarchus. It's named after the man who figured out how far away the Moon is, two thousand years ago ...'

She looked at his pointing hand. Even though he had washed and showered, over and over, she saw there was still black Moon dust under his fingernails, and ground into the tips of his fingers. It was going to take a long time for him to get clean.

He was still dog tired after the trip. But he couldn't sleep. Even when he lay flat in his bunk, he said, it felt as if his body was tilted head down. There was, he said, too much *gravity* here.

A lot of stuff had happened up there, she suspected, that he would never tell her.

He ruffled her hair. 'You think you'll ever get to go to the Moon?'

'What for? There's nothing there but a bunch of old rocks.'

'I thought you liked rocks. Your collection –'

'I like real rocks.'

'Moon rocks are real.'

'But they won't let you touch 'em.'

'Maybe. Anyhow, you're wrong. About the Moon. It's not just rocks. If you lived there you could make metals, and oxygen to breathe, and there's silica to make glass. And with the water from the Poles, you could farm up there.'

'Water? I thought there's no air.'

'There isn't. But there is ice at the Poles. Deep in the dark, where the sun never shines.'

'Really? A lot of ice?'

Her father hesitated. 'Well, some people think so.'

'Anyhow,' she said, 'I don't want to be a farmer.'

Her father stared up at the Moon. 'You know, you're special. I wrote your name up there, in the dust, and it will be there for a million years.'

'You told me, Dad.'

'Yeah.'

A cloud passed over the Moon's face. It got colder.

They went indoors to watch TV.

*One day, human scientists would call it the Impactor.*

*It had about the mass of Mars, a tenth of Earth's. Humans would later speculate that it was a young planet in its own right.*

*But they were wrong. It was not a planet.*

*The object barrelled through the dusty plane of the Solar System.*

*But there seemed to be something in the way.*

... And on the Moon, the Rover had jolted across the bright dust, climbing gentle slopes under the black sky, bathed in the sun's flat light.

It must have looked strange, Jays thought, if there had been anyone around to see it. The Rover looked like a beach buggy from somebody's home workshop. And yet here were the two of them in their shining white pressure suits, like two dough boys riding a construction-kit car, bouncing across the Moon itself.

They rose up a slight incline.

Suddenly there was the rille: Schröter's Valley, a gap in the landscape in front of them. It wound into the distance, its walls curving smoothly through shadows and sunlight. Jays could see boulders that must have been the size of apartment blocks, strewn over its floor.

Jays tried to keep the excitement out of his voice. 'Look at that old rille. I'm sure I can see layering in the far side. Look, Tom. Over at one o'clock.'

Tom, distracted by the driving, said, 'Let's get up there before we do any geology.'

The Rover jolted to a stop.

Jays released his seat belt, and let it snap back into its frame. He tried to stand up. But the slope was deceptive; it was an effort to haul his suited frame out of the Rover's lawn seat.

He took a step away from the Rover.

His suit was a stiff bubble around him, shutting out the Moon. He could hear the whir of pumps and fans in his backpack, feel the reassuring breath of oxygen over his face. The sunlight caught scuffs and scratches in his gold-tinted sun visor, creating star-bursts.

He looked up, towards the south, and there was the Earth, hanging in the sky like a blue thumb-nail. He could see a depression over the South Atlantic, a fat white swirl. Other than the Earth and the big white spotlight that was the sun, the sky was empty: save only for a single bright star that tracked across the zenith every couple of hours. That was the Apollo Command Module, waiting in orbit to take them home.

*Jays, when you climb off, could you dust off our TV lens, please?*

'Roger.'

He turned back to the Rover. The TV camera, operated from Houston, was a block covered by gold-coloured insulation, mounted on a bracket at the front of the Rover. He could see that dust had kicked up over the lens and insulation and cabling.

He leaned forward. He took a breath, out of instinct, as if he could just blow the thin dust layer away. But this wasn't Earth; there was no air here, and his head was locked inside a bubble of plexiglass ... He looked for the soft lens brush, and swept away the dust.

As soon as he was done the camera turned away by itself, and began to pan across the landscape in eerie silence.

*It was, perhaps, the most dramatic collision event in the history of the Solar System. Humans – trying to figure out how their world and its unlikely, huge Moon had come to be – would call it the Big Whack.*

*The Impactor hit Earth obliquely, like a cue ball kissing its target. Earth, much more massive, absorbed the momentum of the Impactor and spun up its rotation. Mantle material vaporized and entered orbit around the Earth. Earth's crust melted; Earth became, as if young again, a roiling ball of lava.*

*The orbital cloud of superheated mantle rock condensed into droplets, a dusty, rocky ring circling the Earth. But the ring was not stable. In a miniature rerun of the formation of the Solar System itself, the debris began to accrete.*

*It took a mere century for the debris to assemble into a new world: it was the Moon, a ball of magma glowing balefully in Earth's sky. The remains of the Impactor were trapped in the Moon's heart.*

*The new world was coming of age in a Solar System that was still very young, and huge left-over planetesimals continued to bombard its surface. Impact basins formed, wounds huge and deep, and waves of pulverized rock rushed over the surface of the Moon to form gigantic ringed structures. Immense blankets of ejecta were hurled thousands of miles over the battered ground. But so intense was the continuing flux that the formations were themselves soon shattered and covered over.*

*At last the flux of planetesimals began to tail off. In a moment of geological time, the last great impacts formed basins and mountains which froze forever the face of the Moon.*

*The Moon became a small, cold world, its evolution over a billion years after its birth, its youngest rocks more antique than Earth's oldest.*

*And, far beneath the dusty plains, the remnant of the Impactor brooded, embedded in darkness.*

On the Moon, Tom Barber was going through Rover read-outs for Houston. 'Amp-hours 90,92. Voltages 68, 68. Battery temperatures 101 and about 100; motor temps off scale, low. Bearing is 088, range 1.8, distance 2.5 klicks.'

*Thank you ...*

Jays picked up a couple of sample bags from the stowage in back of the Rover, and took the geology hammer from Tom's backpack, and his tongs from the Rover's footpan. He pulled the gnomon out from its stowage sleeve behind his seat. In stowage, the gnomon's three legs were folded against the central staff to make a slender sheaf. When he extracted it the legs sprang out into a spindly tripod.

Carrying his tools he loped away, towards the rille.

The regolith crunched under his feet, sinking maybe a half-inch, before he settled to a firmer footing. The dust sprayed around his feet, sinking quickly back to the surface. It was like walking on crisp, frozen snow, or maybe a cinder track.

He had to climb up a slight incline to reach the rille's rim. He was out of breath in a few steps. Still, he persisted.

He paused for a breath. He turned and looked back at the skeletal Rover. It looked like an ugly toy: squat and low, sitting there in a churned-up circle of dust. Its orange fenders and gold insulation were the brightest things on the surface of the Moon. A few yards beyond the Rover, Tom was working. He was gouging at the surface with a long-handled tool, taking a rake sample of the dust. His red commander's armbands were bright.

Jays took a swig of water from the bag inside his suit. He felt his chin strap rasp against a week-old beard. He'd promised his daughter, Tracy, that he wouldn't shave until he got home. After all, in the picture books, the explorers always came home with beards.

The Rover's television camera was watching him, cold and judgemental. Time is ticking on, it seemed to say, billion-dollar seconds wasting while you stand there and goof off.

He turned and continued.

He reached a flat crest, and came suddenly on the rille.

He stopped. He raised the five-hundred-mil camera from its bracket on his chest, and took a horizontal pan, turning slowly, and then a vertical pan, all the time geologizing, describing what he saw.

The rille was up to eight miles wide, a half-mile deep, and all of a hundred miles long. Schröter's Valley, the biggest rille known on the Moon. It was a river valley, but cut into the bottom of this dead lunar sea – not by water – by a lava flow, some time in the deep past.

He stepped forward again.

As he approached, the surface of the mare sloped gently towards the rille rim, and the regolith was getting visibly thinner. The rille walls sloped at maybe twenty-five or thirty degrees.

The sun was behind him. The far walls were in full sunlight, and now Jays was sure he could see layers: distinct strata in the rock, poking through the light dust coating.

Excited, he described what he saw. 'Okay, Joe, I think I can see from top to bottom, one distinct layer about ten per cent, which has multiple layers within it. And another at about forty per cent

down, which looks like a solid unit of a somewhat harder, tan-coloured rock, but it's covered with fines and talus. We haven't seen to the bottom; I think I'll get the chance to go further down ...'

He felt his heart thump. The rille layers were a record of the Moon's volcanism, the strata left by ancient basalt floods, driven by an internal heat that had all but died almost as soon as the Moon formed.

The only other volcanic remnants Apollo crews had found had been dug out by impacts, shattered and melted and reformed, scattered over the surface, heavily processed. In the rille walls, though, he was facing true lunar bedrock. What he had come for.

Samples of basalt from the maria – the lunar seas, like Apollo 11's Tranquillity – would take you back as far as the age of mare volcanism, when founts of lava had flooded the great impact basins. But if you wanted to look further you had to go find bedrock: dusty windows on even greater antiquity, all the way back to the birth of the Moon.

Bedrock was the core of the mission, as far as Jays was concerned. And a big fat sample of bedrock, maybe from deep inside that old rille, would be his trophy fish.

He felt his soul expanding.

Nobody had ever seen this sight before, nobody. And, no matter who came after him, for whatever purpose, no matter how much smarter they were than him, they could never take that away. Schröter's Valley would forever be a part of him.

He went over a crest, and was now descending into the rille itself. But there was no sharp drop-off; like every other surface here the rille wall was eroded to smoothness, and the footing was secure, the regolith layer thin.

For a moment he thought he glimpsed a stretch of the very bottom of the rille. Something shining there. But that was impossible, of course. It had to be a trick of the light. A scuff on his faceplate.

... And then he saw it, sheltering beneath a hummock in the regolith. It was a dark basalt, a lava lump about the size and shape of a football. When he brushed away the regolith he could see it was protruding from a rock layer, like the ones he could see so clearly on the far side of the rille.

Jays wanted to get this one right.

He took careful photographs of the rock in its resting place. Then he tried to set up the gnomon beside it, the smart little tripod that would give him scale, local vertical and orientation compared to the angle of the sun.

This was called *documenting the sample*. The idea was that back on Earth, if they knew exactly how the sample had been taken, the scientists would be able to reconstruct the geology of the area at leisure.

But the documenting turned out to be a scramble. The slope was too steep for the gnomon, and he wasn't sure the photographs would pick out the rock from its background. He did his best; but the guys in the geology back rooms didn't always understand how tough their procedures were to follow once you were *here* ... Still, surely the rock would be worth it.

Of course the rock would be given a number of its own. A five-digit code: 'eight' for Apollo 18, 'six' because this was their sixth survey stop, and a number for the sample in the order they'd taken samples here, which had to be up in the forties or fifties already, he figured.

He bent sideways, stiff in his inflated suit. He was able just to pick up the rock; it fit his hand as if it had been meant for him.

He put his prize in a numbered Teflon bag. Then he photographed the place the rock had come from.

Movement. The dust was *stirring*, where he'd lifted the rock. When he looked again, the movement wasn't there.

Never had been there. *Been out here too long, Jays.*



Tom was calling. They had to complete a rake sample, a random representative selection of the rocks here, and then move on.

He had just arrived, having come all this way, and it was already time to leave.

Jays took a last glance down inside the rille. He tried to peer down as deep as he could, straining to see to the bottom. The slope looked easy; he wished he could go a little further, deeper into the rille. But he knew he mustn't. He was a long way from Tom's helping hands, if he ran into trouble. And anyhow, he was behind the timeline.

He knew he wouldn't mention what he'd seen to Tom.

On impulse, he leaned over, scooped up another fragment of the bedrock sample, stuffed it inside a sample bag and crammed it into a pocket on his leg.

Then, his bedrock under his arm, he snapped shut his sun visor and clambered back up the slope, towards Tom and the waiting Rover.

*After a four-billion-year wait, the visit with its burst of activity had lasted only three days, the final flurry of dust settling after only seconds.*

*At Aristarchus Base, Rover tracks and footprints converged on the truncated base of the abandoned Lunar Module. The blast of the departed ascent stage's engine had left a new ray system, streaks of dust which overlaid the footprints.*

*Now the Moon was inert once more, the sculpted hills of the Aristarchus ejecta blanket rising above this puddle of pitted, frozen basalt, their slopes bathed in sunlight, shining like fresh snow.*

*Waiting.*

*In places, the disturbed dust stirred. Glowed softly silver.*

## II ARD TOR

### I

Geena Bourne woke up before dawn. She was, of course, alone in the apartment.

She got up in the dark and walked around putting on lights.

Henry had gone.

Fled. But he'd taken nothing. No furniture, no carpets or curtains, no CDs or books, not even his own clothes. Nothing but his geology hammer, as far as she could see.

Oh, and Rocky, their labrador, the Rock Hound.

*Shit.*

It was worse than if he'd taken everything, or trashed the place.

Still, she knew where he'd be. She pulled a coat over her pyjamas, got in the car and drove out, through the night, to the USGS.

It was cold. Always cold, here in the mountains.

The Cascades Observatory of the United States Geological Survey was a squat, unimposing two-storey building, a slab of cinder-block. In the harsh, incomplete glow of its security lights it looked sinister, like some prison block transported from Soviet Russia.

She had a little trouble with the guards. *Lady, it's 3 a.m. Do you know what time it is? 3 a.m.* ... But her NASA pass and a little sweet-talking got her inside.

And here was Henry, tucked up on top of a sleeping bag he'd spread out on the floor of his cramped office. The clutter of his work lay everywhere: geological maps and structure charts, trays of samples, microscope slides with slivers of rock, electronic parts, his precious polarizing microscope inside its grimy, worn-smooth wooden box. And Henry himself in the middle of it all, as sound asleep as if he were out on a field expedition in the Kalahari, his long, thin body folded over, his heavy black hair falling around his face.

Rocky was here, lying on a blanket in a crate in the corner. The mutt came forward, licked her hand regretfully, and went back to the crate and fell asleep.

She prodded Henry's kidney with her toe, reasonably gently. 'Hey. Crocodile Dundee. Wake up.'

He came awake, with an ease she'd always envied.

'It's you.' He rolled over and sat up.

'Of course it's me.'

'I left, Geena. It's over.'

'Do you have any coffee in here?'

He ran his hand over his stubble and yawned. 'No,' he said. 'Go away and leave me alone.'

'Believe me,' she snapped back, 'there's nothing I'd like better. But I can't just walk away.'

'Why not?'

'Because we have things to talk about.'

'Geena, my lunar probes just got canned. My career is stiffed. *What* things?'

'Our assets, Henry. Our property.'

'All there is, is *stuff*. Burn it. I don't care. Sell the apartment. It was no use anyhow, since we both spent the last two years working out of Houston.'

She said heavily, 'We're taking apart our home.'

He closed his eyes.

'I know.'

'Then you can't just walk away. You have to go through the pain, Henry ...'

There was a light in the window.

Maybe it was the torch beam of some security guy, Geena thought, distracted. Rocky whined a little, and padded over to the window. Whatever the light was, it was high up; it cast Rocky's shadow on the floor behind him.

Not a torch beam, then.

Even as she tried to deal with this situation with Henry, her damn problem-solving brain kept working. Something in the sky. A chopper beam, maybe a police patrol? But the beam would shift. And there'd be noise. The Moon, then? But the light was the wrong quality, vaguely yellow-white. And besides, the Moon was near new tonight.

The dog was staring up at the light as if he'd seen a ghost.

She said, 'What about the dog?'

'He comes with me. He's my dog. He predates you.'

'I suppose he does. But he's used to staying with my mother –'

Henry unfolded off the floor and stretched, tall and wiry, strong hands flexing. His face was dark in the uncertain light from the window, weather-beaten by all those days in the field. He looked towards the yellow glow at the window. 'What the hell's that?'

'I thought it was a chopper. But it isn't.'

'No.'

They walked towards the dog, still standing in his shaft of light, Henry's bare feet padding on the tiled floor.

'... Jesus,' he said.

'What is it?'

Henry was standing over the dog, staring up into the anomalous light. She came to stand beside him.

The light, beaming in through the window, was so bright it was glaring, dazzling, like a spotlight in the face. But she could see it was a point source.

It was fixed in the sky. There was no noise, no rotor clutter.

The light was eerie. Not part of the natural order. This is bad news, she felt instinctively.

'What do you think?' he said. 'A planet?'

'Too bright.'

'A satellite?'

'Not moving quickly enough.'

'A star, then,' he said. 'It would have to be a nova. Or a supernova.' He frowned. 'I don't like it.'

'In case it's a supernova?'

'Even if not. It shouldn't be there.' He glanced at her. 'Don't you feel it?'

'Yes,' she said reluctantly. 'I guess I do.' Bad news. 'What would a supernova do to Earth?'

He shrugged. 'Depends how close. Supernovas are candidates for causing extinction events in the past. The radiation burst, the heavy particles ... A massive star exploding within a hundred light years might give the planet a dose of five hundred roentgens.'

'Enough to kill.'

'Oh, yes. Even the trees. Did you know that? Trees are about as sensitive to radiation as humans. Also, all that ultraviolet hitting the atmosphere – disassociated nitrogen will oxidize to form nitrous oxide, which will react with the ozone and deplete it –'

'Just as well we destroyed the ozone layer already, then,' she said drily. 'But maybe it isn't a supernova.'

She couldn't identify what part of the sky this lamp hung in. Her astronomy wasn't so good, considering her career choice. But then it didn't need to be, if you planned to spend your working life in low Earth orbit. 'What else could it be?'

He leaned forward, resting his hands on the window ledge, and looked around the sky. 'I wish they'd clean these windows. Kind of a poor observing platform we have here ... Oh.'

‘What?’

‘I think it’s Venus.’

She frowned. ‘Venus, the planet?’

He said heavily, ‘What other Venus? It’s right where Venus is supposed to be, tonight. And I don’t see any bright object nearby that could be Venus. So, it’s Venus.’

‘But how can it suddenly become so bright?’ She remembered an old science fiction story. ‘*Oh*. Venus is closer to the sun than Earth. What if the sun has flared? Or even gone nova? And the reflected light –’

‘No.’ He shook his head. ‘It’s near superior conjunction right now. Which means it’s on the far side of the sun, so showing us a full face. So if you think about it, by the time the increased sunlight reflected off Venus and crossed space to get here –’

‘The sunlight would have reached us direct, already.’ A suppressed sigh of relief. ‘So Venus itself must have gotten brighter.’

‘Which is impossible.’

‘Is it? Maybe it’s some kind of volcanic thing.’

‘What kind of *volcanic thing*?’

She was used to his sarcasm. ‘You’re the geologist. Think of something.’

He went to the back of the office, and came back with a scuffed pair of binoculars. He raised them and focused them briskly.

He whistled.

‘What?’

He passed her the binoculars, leaving the strap around his neck, so she had to lean towards him to use them. She scanned around the sky, seeking the glare.

The binoculars resolved the distant, fixed stars to points. The glasses were too weak, she realized, to resolve Venus – on normal nights – to anything better than a minute disc, or crescent, at best.

But this wasn’t a normal night.

Where Venus ought to have been there was a bright, smudged disc, not quite symmetrical.

‘Holy God,’ she said.

‘I think,’ Henry said, ‘that Venus has exploded.’

The call didn’t wake Monica Beus, for the simple reason that she hadn’t been asleep.

‘Yes?’

*Monica. It’s me. Alfred.*

Alfred Synge: astronomer, colleague, lover back when they and the world were young.

‘Where are you?’

*Kitts Peak. The observatory. Have you seen it yet?*

‘What?’

*Take a look out the window.*

She lay for a minute in the stale warmth of her bed. The insomnia was the worst thing, for her, about the diagnosis.

*Breast cancer.* What the hell kind of thing was that for her to contract? Her breasts had gotten her nothing but unwelcome attention when she was younger; she was of a generation that had been encouraged to use them as little as possible for what they were intended, which was to suckle children; and now some cosmic ray, a random piece of debris from some long-gone supernova explosion, had come whizzing across space in order to zap her *just so* ...

If any of it made sense, it might be acceptable. But it didn’t. If she had no stake in the world – if her son, Garry, and his family, didn’t exist – it might be reasonable. But she did have.

She missed the ability to sleep, though. She longed for the ability to turn off her mind, the constant *thinking*, like a camera watching the world that never let up.

But sleepless or not she was warm and comfortable here, her aches and pains fooled into silence for a while, and she felt reluctant to climb out into the harshness of the cold, vertical world. And for what?

‘What is it, Alfred? A lunar eclipse? A meteor shower?’ Alfred did get a little carried away with his profession at times. It was enviable, a man whose job was his hobby, his passion. Also a little irritating.

Uncharacteristically, he hesitated. *I think you ought to see for yourself.*

‘Why?’

*You might want to think about waking the President.*

Not a lunar eclipse, then.

She got out of bed, and her body set up a chorus of aches. She pulled on a housecoat, picked up the phone handset, and walked to the window.

She pulled back the heavy drapes and looked out over Aspen.

Dawn was coming, she saw, and the leaves of the trademark aspen trees were already glowing with the pearl light, bone white; the quaint street lamps were starting to dim. Another hour or so and the first light of another early spring day would be touching the Rockies.

Beautiful place. She had moved here to be close to her faculty, at the Center for Physics. She suspected she was going to have to move before long, though. She couldn’t see how she could stand to die *here*, to leave behind so much beauty. Everybody should die someplace ugly, where it wouldn’t matter so much ...

On the other hand, maybe it was this beautiful place that was killing her. Up so high, poking out of Earth’s shielding blanket of air, Aspen received twice the sea-level dose of radiation.

There was a new star in the morning sky, bright as a piece of the sun.

*It’s Venus*, Alfred, on the telephone, was telling her. *Venus*.

It was casting shadows, long raking shadows, from the aspen tree stands.

The astrologers will be jumping up and down, she thought. We’re only a few years into the new millennium ... and now *this*.

‘Venus? How can it be?’

*I’m afraid there’s no doubt. What you’re seeing is reflected light from the sun, with some intrinsic illumination from the planet itself.*

‘Reflected light?’

*Monica, the atmosphere seems to have – blown off. The planet is surrounded by an expanding sphere of gases and other debris.*

‘Debris? You mean rock?’

*Yes. Also fusion products. And the intrinsic illumination – Monica, something is happening on the surface, or maybe in deeper layers. Something very energetic.*

Alfred had first gotten the call from his night assistant, a graduate student. It was the student’s job to control the big telescope Alfred was working on at Kitts Peak. Alfred, sitting in an office, confirmed whatever target star he wanted, and observations were made with spectroscopes and charged-couple detectors.

Nobody had been watching the planets, at Kitts Peak Observatory. It was just a casual glance out the window by the night assistant that had led to her noticing the change to Venus.

That was the way with modern astronomy, Monica thought wryly. Nobody looked *through* the big telescopes any more.

*We were finishing up for the night. We were actually getting ready to park the telescope and –*

*‘Tell me what you did.’*

*The first thing was to get on the IAU nets. The International Astronomy Union, the astronomers’ jungle telegraph. There are ground-based observers working on this all over the planet already, Monica. Also the radio telescopes. I contacted NASA; they’re repositioning some of the satellites, for*

*example the ultraviolet and X-ray and gamma ray observatories. We're also speaking to the Europeans, Canadians and Japanese. The Space Station astronauts are doing some good work. NASA are sending up high-altitude experiments, by balloon and sounding rocket and aircraft. NASA are responding quickly, in fact.*

'Well, NASA would,' she said drily. 'They're probably putting together a budget proposal for a new Venus probe as we speak.'

*If they are you ought to back it, Alfred said. Monica, we don't have the faintest understanding of what we're seeing here. Right now Venus is on the far side of the sun. It took around fourteen minutes for the light curve to show up here. Photons, travelling at light speed. A minute later, a cosmic ray shower showed up.*

'Cosmic rays, from Venus?'

*You heard right. Very high energy particles. And in about four hours we're expecting a blast shell to impact the top of Earth's atmosphere. The lower energy stuff, coming at thirty or forty million miles an hour. Monica, it's as if a miniature supernova went off in our back yard. Hell, we're even seeing a neutrino flux.*

'That's impossible.'

*Nevertheless. I'm not anticipating a lot of sleep in the next few days. Monica, that thing is going to be naked-eye visible, even at noon. It's going to be unmissable.*

So the public would wake up to it, to funny lights in the sky. Monica was one of the President's senior science advisors. How was Monica going to brief her on this? 'Tell me what to expect.'

*The low-energy cosmic rays will be deflected by the Van Allen belts, which will fill up. We have to expect auroras. Spectacular stuff. Alfred sounded excited, as well he might, she mused; it sounded as if he might get priority on this discovery. The higher-energy stuff will make it through to the atmosphere. Crack the air molecules, create showers of secondary particles. We have to expect a significant increase in background radiation.*

'How much? For how long?'

*We don't know, Monica. We've never seen anything like this before. There is also the shower of X-ray and gamma rays. We don't know how strong it will be at its peak. Maybe there will be some immediate deaths. More likely we will see a pulse of internal cancers, skin cancers, cataracts, in the coming months and years. We will have to monitor the food chain.*

'What should the President tell people?'

*To take radiation precautions. Get underground if they can; rock and soil is a good shield. The military and politicians ought to get into their nuclear shelters. If they still have them.*

'They have them.'

*If the shower persists we'll have to think about lead-lining our surface buildings. Oh, air travel ought to be curtailed, at least monitored. And we ought to think about bringing the astronauts home from the Space Station.*

'Enough. All right, Alfred. Thanks. I ought to make some calls.'

*Yes. Take care, Monica.*

'And you. Keep in touch.'

*Oh, I will.*

She put down the phone, and tried to think this through.

It was hard to focus on anything outside her own, failing body. As if she was a self-obsessed character in some daytime soap.

But, it seemed, she was still engaged with the world.

Outside, the light of day was gathering, but the ugly wound in the sky that was Venus was barely dimmed.

She put through a call to the White House.

Even after a week the light of new Venus, bright in the blue sky of a Scottish morning, made Jane Dundas shiver.

Anything so far out of the natural order made her shiver.

Or then again, maybe it was just *this place*. She looked up at the tower block. Its faceless windows reflected Venus a hundred times over, somehow without generating a shred of beauty. She clung a little harder to the hand of Jack, her ten-year-old son, and stepped forward.

Cordley Road was the site of some of Edinburgh's more notorious blocks of council housing. Even here, at the entrance, the block was intimidating: evidently repainted and fitted with entry-phones, but a leaking overflow had stained the entrance with damp, graffiti was splashed over the hall, and the shrubbery outside, newly planted, was littered with lager cans and cigarette packets.

The irony was the location here should be prized. Cordley Road was less than fifty yards from the perimeter of Holyrood Park, which contained Arthur's Seat – Ard Tor, the greatest of the extinct volcanoes on which Edinburgh had been built. She could see the Seat now, a lumpy shoulder of rock looming high to the east; just here she was in the shadow of the Salisbury Crags, a cliff-like extrusion of compounded ash from the old eruptions, glaring over the city like the guns of a battleship.

But what went on in the tower blocks here had nothing to do with anything so wonderful as extinct volcanoes.

Billy Macrae was here to let them in. Billy, ten years old, was one of Jack's friends from school, and brother to Joe, eleven, who was the kid who had been killed in the lift shaft. Billy had a pixie face compressed under a mat of black hair, and he looked like a wee rascal, as her father might have said. But today he looked subdued. No trouble at all, in fact.

Billy led them to his family's flat, which was, ironically, on the ground floor. The father let them in. Alan Macrae was a tired-looking man who was probably younger than Jane. No sign of a mother, Jane noted.

He waved them to the sofa. The place was sparsely furnished but clean enough, no more than the usual clutter kids created. Macrae offered them tea but Jane declined.

'We don't want to keep you.'

'Aye. I'm sorry we couldn't have wee Jack to the funeral. We tried to keep it small. Just family.'

'I understand.'

Macrae made an effort to smile at Jack. 'Joe used to talk about you.'

'We played soccer,' Jack said.

'Aye. Not in the hall here, I hope.'

'No.'

Jane nudged her son, and he produced his gift, a little parcel. Billy Macrae came forward and unwrapped it. It was an elephant, carved of black stone.

Jane smiled. 'Jack chose it himself from my shop. The rock's basalt. Lava. The youngest rock on the planet. So it's appropriate.'

Macrae nodded, and put the knick-knack on the shelf over the gas fire. 'We got a lot of flowers. People put them in the lift. But they get robbed, of course. The council say they will put steel plates on the lift doors to stop the kids breaking in, fat lot of good that is now.' He eyed Jane. 'You're the one who runs that shop in Waverley Market. Rocks and stuff. Crystals.'

'That's right.'

He looked at the elephant. 'I saw it, you know.'

'What?'

'I was on the seventh floor, talking to a mate up there. The windows in the lift shaft doors are broken there. So I saw him fall. Terrible crashing and screaming.'

Jane sat silently, and the boys looked at their feet miserably. It sounded as if Macrae was beyond grief, as if he'd told this story a hundred times over already, as if he couldn't stop telling it; his voice and face were empty of expression.

‘Lift surfing, they call it,’ he said now. ‘Bloody stupid.’

Jane forced a smile. ‘I used to play chicken on the motorway. All kids are stupid, until they learn better.’

Macrae didn’t seem to have heard. ‘They jam open the shaft doors, see, and that stops the lift going down. Then they get on the roof, and they know how to set the engineer’s switch to “test”, so they can control the lift. Joe got his bloody hand caught, and for some reason the lift started going down, and he fell down behind it, in some kind of maintenance shaft. And that’s what I saw. Crashing and screaming. The thing of it was, at the bottom, he looked all right. Except for his mangled hand. Just asleep ...’

And so on.

She stayed for a while longer, letting him talk out his grief a little more. Jack was restless, but she made him sit through it. Survival lesson, she thought. Listen and learn.

But it was hard. It seemed a long time before little Billy led them out.

In the yard, they all cast double shadows from sun and Venus, twin stars, and Jane shivered again.

‘It was our Hamish,’ Billy said unexpectedly.

‘What?’

Hamish turned out to be the elder brother of Billy and dead Joe. Eighteen years old. Jane realized, in retrospect, that there had been no sign of Hamish in his father’s flat.

Hamish, it turned out, had led on the others.

‘Hamish used to take stuff up there,’ Billy said.

‘Stuff?’

‘Lager. Ciggies and things. He even had a seat, so he could sit on top of the lift and ride up and down.’ Even now, even after all that had happened, Billy smiled faintly at the bravado and daring of his brother, and Jane realized anew how very, very difficult it was to restrain boys from following the pack, all the way into the jaws of death.

‘But it was Hamish’s fault,’ Billy said.

‘It was?’

‘He saw that planet thing,’ Billy pointed. ‘When it flared up, like. Hamish saw it through a window. That’s why he let go of the doors, and the lift started going, and Joe fell down.’

This boy will have to live with this. ‘Billy, Hamish is really just a kid too. Nobody’s to blame –’

‘Hamish says it’s not his fault. It’s the fault of *that*.’ And Billy’s small, grubby hand pointed straight at Venus.

... And elsewhere in Edinburgh, a young policewoman called Morag Decker was pulling on her uniform, about to start her tour of duty. She was on attachment to a community policing unit that night, and would be working with drug addicts. Not an assignment she was looking forward to, but a major problem in Edinburgh. When Venus had first flared up it had caused a problem, as the full-Moon types had crawled out from under their rocks to howl at the new light in the sky; and tomorrow the local Emergency Planning Officer was going to brief them on Scottish Office guidelines on radiation poisoning and other stuff ... But all that seemed to be fading, like any other nine-day wonder. For tonight her head was full of apprehension, and she tried to comfort herself with thoughts about the video and takeaway Chinese meal and bottle of wine she’d treat herself to tomorrow night, and she scarcely noticed Venus any more ...

... And to Debbie Sturrock, a trainee firefighter based along the coast in Dunbar, Venus was invisible, a light in the sky masked by the tower of flame she and her fellow students were trying to control, under the growling command of an unsympathetic station master. Fire in the sky meant nothing when you were confronted by fire on Earth ...

... And in Glasgow, Scotland’s biggest city, Jenny Calder had tried to follow the news – she had been interested in astronomy and science and stuff as a kid, and the Venus incident was strange



and somehow disturbing – but now the kids were fighting again, this flat in the Gorbals, renovated or not, was just too small for all of them, and William, her husband, was worrying that if his new employers found out about his record he'd be kicked off the oil rig again, and so she pushed her hair from her eyes and stumbled from crisis to crisis, never quite falling over, and Venus was just too far away and too strange to deserve her attention ...

... And around the world, in the US, an Air Force pilot called Garry Beus test-flew an enhanced F-16 over the baked desert of California and looked up at Venus, smeared and distorted by his canopy in an eggshell sky, and thought with wistful sadness of his dying mother Monica, and how she must be fascinated by this ... And in Los Angeles, a journalist called Joely Stern, dismayed by yet another rejected job application, stared up at a Venus made Mars-red by filthy LA smog, and she stared at it, wishing she was up there, up in space, anywhere but *here* ...

... And in Japan, a geologist called Blue Ishiguro watched the evolving light in the sky, fascinated, and wondered if he should call his friend Henry Meacher at NASA who might know more about this – but then he'd heard Henry was leaving NASA, not to mention Geena, and it mightn't be a good time ... And, atop a Japanese mountain called Nantai, a Buddhist monk – originally from Ireland, called Declan Hague – stared at the strange light and wondered what it might mean for his self-imposed exile and the guilt that still racked him ...

... All around the planet, as it turned in the wash of Venus light, human faces were lifted to the sky, shining in the strange light like coins in a well, amused or puzzled or wondering or indifferent ...

... And in Houston, Tracy and Jays Malone spoke in hushed tones, so as not to wake the kids.

More than three decades after his Moonwalk, a few years into a whole new century, and here was Tracy with kids of her own, kids to whom Apollo was some sort of Cold War relic – not even that, something prehistoric and incomprehensible, something their grandfather had done. For somehow, as if mocking the old dreams, the space program had become a thing of the past, not the future.

But her name was undoubtedly, famously, written on the Moon – she'd seen photographs of it – and it would indeed be there for a million more years, less the few summers she had spent growing up since Jays came home.

So there had been only one place to come on this strange and cosmic night.

She stood with Jays on his verandah. It was just like all those years ago, except that now she cradled a pina colada in her hand instead of a soda.

And, in the dawn sky, there was a new light, which outshone even the battered old Moon.

'Quite a night,' said Jays, the light casting sharp point-source shadows on his face. 'Quite a week, in fact.'

'Yeah.' So it had been, all of seven days after the Venus event first showed in the sky.

According to the TV there had been Venus-watching parties all over the US, a predictable run on telescopes and binoculars in the stores. The Hubble Web sites had crashed from the hit traffic, even though NASA hadn't turned the Hubble that way yet.

She said, 'Those guys on the TV, yammering about anti-matter comets and alien invaders. *The most remarkable week since Neil Armstrong touched down on the Moon* –'

'Or *since man came out of the caves*. Makes you miss Cronkite,' he said, 'and I've been further out of the cave than most.'

The heatless light of dying Venus made her shiver. 'So what do you think has happened up there, Dad?'

'Danged if I know.' His voice was light, but his face was a mask, expressionless. 'I don't think it's a good omen, though.'

And that made her more queasy than all the fantastic speculations of the TV pundits.

He touched her arm. 'Come on. I want to show you something.' He led her indoors, towards the lounge. 'Something I never showed anyone. Not even your mother.'

'Why not?'

He grinned, and put his beer down on top of the piano. 'Because it's a federal offence.' He started to rummage at the back of a dresser drawer.

She looked around the room. So familiar, nothing changed since she was a kid, it was like being transported back in time. It was an old guy's trophy room, with Jays's photographs of airplanes and spacecraft, a whole-globe view of Earth taken with a hand-held Kodak, a little framed patch of spacesuit, grey with Moon dust. But everything was old and faded. Even the spacesuit piece looked like it had come over on the *Mayflower*.

Jays approached her. He was carrying something in a fist-sized plastic envelope. The plastic had gone yellow and brittle with age. In the gathering dawn light, she could see it held a piece of rock, black as tar.

'Oh, Dad. Is that what I think it is?'

'It's a piece of bedrock, sweet pea. It froze out of a lava flow, that bubbled out of the Moon more than three billion years ago ...'

It was, of course, Moon rock.

'Are you supposed to have that?'

He grinned, his teeth white in Venus light. 'Hell, no. I told you. It's a federal offence. I grabbed it when I was deep inside the rille, out of sight. They never missed it. Our documentation wasn't worth jack shit anyhow. I wanted to leave it to you and the kids. So I will. I never even took it out and looked at it before, all these years. Come on.' He stepped towards the porch.

The eastern sky, behind the house, was growing pink, but the Atlantic behind them was a mass of darkness still. Jays found a place to hold his rock so it cast two shadows in his hand, from sun and Venus.

'It looks like coal,' she said.

He laughed. 'The Moon is dark. If it was bright as Earth, acre for acre, you could read by its light. But you'd never see the stars ...'

There was a sharp smell. Like before a storm. Or like a beach.

'Dad, what's that?'

'What? ...' But now his older senses registered it. 'Ozone. Electrical fire.'

We're not in a spacecraft now, dad, she thought. But still, maybe she should go get the kids –

Jays dropped the rock – it thumped dully on the wooden patio – and he tucked his hand under his arm. 'Jesus, that's hot.'

## 2

The day of Geena's post-flight press conference was, it turned out, the last day Henry would spend in Houston. So Geena, with a sinking heart, realized she had no excuse to duck out of seeing him, one last time.

She drove the couple of miles to the Johnson Space Center from their abandoned Houston home, in the decaying 1960s suburb of Clear Lake. On NASA Road One, she found herself queuing in a bumper-to-fender jam. Once more, NASA Road One was being rebuilt; it was choked by huge, crudely-assembled contraflows, and the multiple surfaces made ramps that slammed into the suspension of her Chevy.

The short drive took her the best part of an hour, and she had no option but to sit there with her starched collar itching at her neck, the skirt of her suit riding up around her knees.

At length she crawled past the wire fence that separated JSC from the rest of the world. Through the chicken wire she could see the JSC buildings, black-and-white cubes scattered over the old cow pasture, looking small and cramped and closed-up, out of place in an era when every office building was a glass-walled rhomboid.

She tried the radio. Every station she found seemed to be playing country music, the modern stuff that sounded to her like soft rock. The DJs harangued her about a write-in campaign to have TNN – The Nashville Network, country music TV – retained by the local cable company. She flipped around to another station, 93.7FM, which seemed to play nothing but 'fun oldies'. They had a policy of no repeats during a single day, and on Sunday mornings, she learned, she could enjoy breakfast with the Beatles. The music, every track of which she'd heard before, was depressing Boomer stuff, and sounded much worse than she remembered; it made her feel very old.

At last she found a news channel, and listened to an earnest debate about whether ebonics should be allowed in schools, and an ill-informed discussion about the latest news from Venus.

She had flown in space on four missions now: two Shuttle missions and two stays on Station. Her last Shuttle flight had finished a month ago, just before the Venus event. And every time she returned to *this* – from the black silence of space, the simplicity of her life and objectives up there – she felt depressed as all hell.

The traffic lurched forward in spasms.

She'd made Houston her home for ten years now, but she was San Francisco born and bred, and she'd never quite gotten used to Texas. Houston was hot and flat, water towers and shining green lawns and under-used malls that sprawled untidily around the downtown towers poking out of the city's heart. Houston was new, its growth fuelled mostly by oil money, but it was half-empty and soulless.

Oh, Houston could give you its moments – driving around the Loop you would sometimes get a fine view of the Port of Houston, refineries draped in feathers of steam, lights on the stacks glowing yellow – but then she'd never had an ambition to live in a *Blade Runner* diorama.

And this area, Clear Lake/NASA, was really pretty seedy. It was a long way out of downtown Houston, off the Galveston Freeway, I-75. The Johnson Space Center was the home of the nation's space program, but at heart it was just an old-fashioned government facility, fading 1960s buildings stranded in an area full of desolate mini-malls and little else.

But even so, she thought, maybe it wasn't Houston's fault she felt so sour about life here.

It would be better when Henry had gone: *Henry*, ex-husband of three days, the living, breathing embodiment of everything that had gone wrong with her life.

As she approached the JSC entrance, she realized she wasn't up to facing the press, or Henry. Not just yet.

She pulled into a parking lot close to the Days Inn NASA, a chalet-style motel almost directly opposite the JSC entrance. She used to stay here when she was an impoverished ascan, an astronaut

candidate, in happier days a hundred years ago. Near the Days Inn was the Puddruckers hamburger restaurant where she used to eat, and a Chinese restaurant. She bought a *Houston Chronicle*, 50c from a vending machine, and walked into the Chinese. It was full of old folks watching TV, and she bought herself soup and a sandwich for \$2.95.

The *Chronicle* was stuffed full of ad sections and bewilderingly dull local news. But it had reasonable coverage of the space program, especially when a mission was in progress, with two or three features a day. A lot more informative than NASA TV, she thought.

Her soup arrived. When she looked up, past the middle-aged waitress, she could see spacecraft, the superannuated inhabitants of JSC's rocket garden, poking above the trees like minarets from some ruined temple. And there was the white-and-black flank of the Saturn V, an operational Moon rocket, lying in the grass.

In the *Chronicle* there was a series of ads for stomach stapling, aimed at those more than a hundred pounds overweight. *Americans always eat too much*, Arkady often told her. Maybe she'd clip this out to show him.

She ate her soup, trying to make it last.

Through the JSC security gate she parked her car. It was a late February day, unusually cold. She walked to where Henry would be working, at the Lunar Curatorial Facility in Building 31N. This was the building where, for thirty years, they had stored the Moon rocks.

She had to climb two and a half storeys. The height was for protection against Class 5 hurricane floods; Mission Control was raised to this level for a similar reason. The weather was thought to be the most likely danger to the rocks, in these post-Cold War days. But just in case of a nuclear attack or similar catastrophe, a proportion of the irreplaceable samples were stored in Brooks Air Force Base at San Antonio, separation being the only defence in case of such a disaster.

To be destroyed in such an attack would have been a strange fate for the battered old rocks which had seen so much, she thought.

She found a friendly technician who would take her in. The woman had worked here for twenty years. The tech was pregnant. That struck Geena as odd: what a start to life, here in the Moon rock lab, halfway off the Earth.

She had to go through the clean room. In an outer changing room she put on a bunny suit: two layers of overshoes, and a button-up white coat and McDonald's-server hat. The garments were labelled 'Lockheed Martin'. There were no gloves, but she had to take off her wedding ring – gold evaporating from its surface could contaminate the samples – and when she slipped it into a pocket she realized, for the first time, she needn't put it back again.

Then the two of them crowded into an airlock, a little two-doored glass-walled room little bigger than a phone booth. Air blowers blasted at them from the ceiling.

The tech opened an inner door, and there she was, in the same room as the most famous rocks in the world.

And Henry.

The lab was a place of rectangles, of big stainless steel glove boxes and staff in white clean-room coats and hats and overboots. The roof was crowded with fluorescent tubes which filled the room with a sickly grey light, a greyness emphasized by the polished steel of the glove boxes and the nondescript floor tiles. At the back of the room, a heavy door led to a vault where the bulk of the lunar samples were stored.

This lab didn't do much original science, in fact. It was really just a service lab, providing sample processing for external researchers. The cleanness standard was tighter than an operating room, though not so tight as, for example, a microelectronics lab.

There was a tour going on, bigwigs garbed out in their white coats, having their photographs taken with the rocks, enduring a running commentary from some flack in a white coat and a trilby.

*... Eight hundred pounds of Moon rock is stored here, as two and a half thousand samples, split into eighty thousand subsamples. Something like a thousand samples a year are taken, mostly less than one gramme. The subsamples are stored in nitrogen, in triple-shelled containers. Efforts are made to reuse the samples, even ones which have been driven to destruction in some way – it is possible that other unrelated tests could be performed even on the detritus. There is a computer database on all eighty thousand subsamples, and handwritten notes and photographs on each one are stored in a fire-proof vault. Even today, sixty per cent of the samples have remained unopened since they were locked up on the dusty surface of the Moon ...*

The receiving lab had been built at the height of the Cold War Apollo era, when funds flowed relatively freely, and everyone worried that there might be bugs in the Moon rocks, that would devastate the world. But the Moon rocks had turned out to be the deadest things ever seen.

She could see Henry at the far end of the room.

He was obviously busy, organizing the packaging of some precious rock or other. He was clustered around a stainless steel workbench with three or four techs, all of them in their white bunny suits, like a conference of surgeons.

She drifted to the front of the lab, and waited until Henry came free.

At the front of the room was a glass wall, beyond which was a viewing gallery, dimly lit.

And here there were three big rocks on display. Each of them was maybe the size of a grapefruit, sawn in half.

These were Moon rocks, she knew.

She'd been with Henry long enough to pick up, however reluctantly, a little geology. The rock on the left was obviously a basalt – a kind of lava – a dark grey structure shot through with vesicles. The rock on the right was a breccia, its structure compound like a granite, big shapeless blobs of different materials. Breccias were the result of violent events, which smashed up rocks and welded them back together again. On Earth they usually formed in river environments. But these lunar rocks had been shoved together by an ancient meteorite impact which pulverized some part of the Moon. Even that impact was more than three billion years ago, older than almost all rocks on Earth. And the centre rock, perhaps the most nondescript, was all of four and a half billion years old.

'... Treat that with respect, Geena; it cost forty billion bucks.'

It was Henry, of course, his fleshy nose like a bird's beak, his black hair an unruly tangle that wouldn't stay put under his NASA-regulation trilby.

Geena said, 'I thought I ought to –'

He talked fast. 'What? Come say goodbye? Gee, thanks. You want to see 86047? That's the rock I'm taking to Edinburgh. Or rather, it is taking me. The only piece of lunar bedrock you're likely to see. What an honour. And the centrepiece of what's left of my career.' He eyed her. 'Maybe you'd like to stomp it, like you stomped my balls.'

She stepped back, until her butt came up against the display case of Moon rocks. She hadn't expected so much anger; it was like an explosion in her face.

'Change the record, Henry. You aren't good at bitterness.'

'You think I'm giving you a hard time?'

'I don't deserve it.'

'Like hell. You shafted the *Shoemakers*. We were going to the *South Pole*,' Henry said. 'A place your Man-in-Space heroes had never dared think about. Great science, and two probes for two hundred million bucks apiece. Christ, do you know how much we could have learned?'

'I know, Henry.'

'Do you? Listen to me – there's water at the South Pole. Not just the bathtub full that *Prospector* found, but a whole frozen ocean of it, laid down by the comets, in great dusty layers, carbon dioxide too, maybe enough to flood the whole damn Moon –'

'I know, Henry. And your fancy probes would have performed the deep core sampling that would have proved it. You told me a dozen, a hundred times. You told everybody else. Maybe –'

'Maybe what?'

Maybe if you didn't shoot your mouth off so much, to me and the NASA managers and on the TV chat shows and in the tabloid papers and in the goddamn JSC staff canteen, you'd exert a little more influence. Maybe this wouldn't have happened to you.

Suddenly, she felt weary of all this. 'You do blame me, don't you?'

'Hell, yes. If you hadn't come out publicly and backed shutting down *Shoemaker* ...'

'It wouldn't have made a difference. Don't you get it? It's all about money and politics and power and rivalry between the NASA centres, Henry. It's a game, that you never figured out.'

He thought about that. 'So what game were *you* playing? If it made no difference what you said, why say anything at all?'

'I was trying to advance my career. What else?'

'At my expense?'

'Look, Henry, it could be worse. You got your lunar bedrock, haven't you? The most important unanalysed Apollo sample left, so they tell me.'

'86047? It's a piece of shit.'

'How can you say that? It's *bedrock*.'

'But that asshole Jays Malone didn't do his documentation right. I don't have the context.'

She knew enough geology to understand him. The geologists had been complaining about the astronauts' performance on the Moon since 1969. Without its context – knowing exactly where a sample had come from, how it was positioned, all the rest – a rock's value was hugely diminished, for a geologist. Maybe that was why they fobbed off Henry with it.

He was still talking.

'... And I have to go to Edinburgh to work on it. The only place that would have me.'

'Come on, Henry.'

'Where the hell is Scotland anyhow?' He waved an arm vaguely. 'Some Scandinavian country, thataway somewhere.'

'You need a change, Henry. A career break. Face it. All this bitterness –'

'The thing of it is, *we'll never know*. Don't you get it yet, Geena? We'll never know, about the South Pole ice. Not in my working lifetime. That's what is killing me.'

She tried to focus, to stay sympathetic, but her attention drifted.

She'd heard this before, too.

Was this the definition of the end of a relationship? When you've heard everything the other person has to say – not once, but many times?

She started to think ahead to her appointments later in the day.

Henry had, she realized guiltily, stopped talking.

He turned, and walked back to his work.

The *Shoemaker* had been Henry's project, the centrepiece of his career. It had actually got further than most. Two prototype landers had been built for real, by the Jet Propulsion laboratory out in Pasadena. Now, as far as she knew, they were being put in storage, or maybe cannibalised for other missions ...

For the *Shoemaker* program had been canned. The manned program – delays to the Space Station, cancellations by the cash-strapped Russians – had taken too much out of NASA's budget.

It had always been thus, Geena knew. A single Shuttle launch, of whatever value, cost as much as both Henry's unmanned science missions put together.

The project on 86047 was no sop, though. The mother rock was being broken up and sent around the world to top geophysics labs for independent analysis. Edinburgh was just such a lab.

They'd done the same, for instance, with the famous meteorite from Mars which had looked as if it held life traces; Edinburgh had got a piece of that too.

And Henry was being sent along with the rock. There was valuable work to be done here, genuine research. But ...

But she'd been with him long enough to understand how he felt.

The cancellation of *Shoemaker* was like the cancellation of his whole career; it meant he wasn't likely to meet the long-term objectives he had set himself, like all scientists, objectives which underlay his choice of particular projects.

Digging aimlessly into 86047 was, by comparison, no consolation.

The visitors were still here. A tech opened a cylindrical case inside a glove box, and pulled out a Moon rock: small, fist-sized, nondescript, sawn in half. Geena could see the vertical burns of the saw. The visitor had his picture taken with it, his grinning face outside the glass, the rock held by a black-gloved hand inside the glass, the camera angled so as to avoid the flash's reflection from the glass.

And in the sterile light of the lab, the ancient rocks from the Moon – many of them older by a billion years than *any* rock that had survived on Earth – sat, wizened and lumpy and wilfully irregular, like resentful old men in a rest home.

### 3

Monica Beus was with Alfred Synge, on the Hawaiian island of Oahu.

She emerged from the dark crater into the blinding light of the sun. She pulled on her sunglasses and checked her floppy hat. She'd snapped Alfred's head off when he showed up with this big hat for her. For the sun, he said. But he was right, of course; the chemotherapy had left her so bald her scalp would fry like an egg, and she was too damned stubborn, naturally, to wear a wig.

So be it. She wore the damn hat, and forgave Alfred for his residual love for her.

Breathing hard from the climb, she clambered on top of an old gun emplacement with a bunch of other tourists and studied the view.

She was at the highest part of Diamond Head crater, here on Oahu. She was surrounded on three sides by Pacific Ocean. The water was royal blue, laced with whitecaps, in its beauty showing no signs of the problems Venus had brought: the plankton die-backs, the collapse of the food chain in some parts of the oceans, depletion of stocks of fish and mammals. In the south she could see windsurfers skimming over the waves, radiation-proof skinsuits gleaming, their elegance and speed a balance between forces, aerodynamic and gravitational. In the west, the sun was already dropping towards the horizon. To the north the Miracle Mile along Waikiki Beach was a thin, golden strip of sand walled off from the interior by slab-like high-rise hotels. Sun, sand, sea, tourists.

And when she looked back she could see into the crater of a volcano two million years dead.

They found a seat. Alfred dug under his poncho and pulled out a laptop; without preamble, he started showing her images of Venus.

'Before and after,' he said drily. He retrieved a classic Venus-from-space image, the featureless pool ball. 'Venus was our neighbour,' he said. 'At its closest, only a hundred times as far away as the Moon. And it wasn't so different from Earth in size. But that's as good as it gets. Otherwise, it was a hell-hole. Fifty miles of carbon dioxide, laced with a little sulphuric acid. So hot the rocks *glowed*, dull orange.'

He showed her surface images, craters and domes and valleys and mountains, constructed from a radar survey by the *Magellan* spacecraft. 'Venus was covered by volcanism. There were flood lavas and volcanic cones and domes, and other features which don't have any analogues on Earth. We didn't see plate tectonics, like Earth; we think Venus was a one-plate planet dominated by hot-spot volcanism. My favourite hypothesis is that there was a catastrophic global resurfacing every half-billion years.'

'A what?'

'The crust melting, globally. There are problems with the heat flow from the interior otherwise ... It would be like five hundred million years of geology crammed into a few centuries. Now,' he said. '*After*. An image taken by the Hubble this morning.'

There was no evidence of a spherical shape. She made out a crudely-defined, blurred oval, with extensive tails, like a comet's.

Alfred said, 'You're looking at a cloud of atmospheric gas, mostly frozen, and ground-up rock.'

'The rock's from the surface?'

'Mostly the mantle, as far as we can tell. Most of the mass is still concentrated near the point where the centre of gravity of the planet used to be. We tried radar pulses from Arecibo, and ... Well. Monica, we can't find a solid object there any more. The substance of the planet is spreading out along the orbit. The ring probably won't stay stable; the perturbation by Earth's gravity will –'

'Hold it. Alfred, I can't follow you. You're saying that Venus no longer exists.'

'Not as a coherent solid, no.'

'That's impossible. How much energy would it take to destroy a *planet*?'



He considered. 'Well, roughly speaking, you would have to lift every piece of rock to escape velocity, out of Venus's own gravity well. There's a quantity called the gravitational binding energy ... For Venus, which had eighty per cent of Earth's mass, it works out as ten to power thirty-two joules – umm, something like a thousand billion times our nuclear arsenal.'

'Just for the record, we aren't talking about your global volcanic resurfacing here, are we?'

He smiled. 'Even that would be quite a spectacle, if it occurred in the lifetime of this astronomer. But no, it's orders of magnitude beyond that.' He rubbed his nose, smearing the gaudy sun block there. 'Those are big numbers. But there's another way of looking at it. If you consider the energy *density* required, averaged over the planet's volume, it isn't so high. Something like a tanker of gas per cubic yard or so, I guess.'

'What are you telling me?'

'We think we are looking at some funny physics over there, Monica. Which is why you and the rest of the particle physicists are going to have to work on this with us.'

'Funny physics?'

'Look at this.' He pulled up results from a cosmic ray detector, tracks left in bubble chambers, accompanying analysis. 'We've found some strange products from the Venus event. Some exotic beasts, escaping from that particular zoo. Have you seen this result?'

A spider-web of tracks, of splits and decay events and spirals and tiny explosions.

She whistled. 'No. I'd *remember*.'

'Well, the results haven't made it onto the nets yet. The authors are still checking.'

'I don't blame them,' she said. 'If this is right –'

'You're looking at a particle with a charge a fraction of an electron's. Which is something we've never seen before.'

'And this mass –' She looked at him. 'Alfred, this is the signature of an elementary particle with a fractional charge, and the mass of a *bacterium*. Now, what processes do we know of which could produce such a thing?'

'We don't know of anything since the Big Bang.' He studied her. 'We're measuring the symptoms here. Guessing at a cause isn't so easy.'

'A cause?'

'A purpose, then. Something has taken Venus apart. It seems to have transformed the planet's own mass-energy to use against it.' He grinned, uneasily. 'We're speculating. Maybe there is something out there that doesn't like planets, deep gravity wells. Something that prefers thin matter clouds. Like the primordial cloud from which the Solar System formed in the first place.'

'*Something*? You make it sound as if this was somehow deliberate.'

He didn't reply to that.

'Listen,' he said. 'We're on Hawaii. We should have ice cream. You want some ice cream?'

She shrugged, indifferent, and he went anyway.

After the Venus event Alfred had come here to the islands to work at the observatory on the summit of Mauna Kea, fourteen thousand feet above sea level. Up there, the air was so rarefied it was as clear a sky as anywhere on Earth, but human lungs only received forty per cent of their normal intake of oxygen. Nobody slept at the summit; the astronomers came down four thousand feet every dawn to sleep over at Hale Pohaku.

Alfred had come down to meet her. Monica knew there was no way she would be able to tolerate the summit conditions.

Thus, death was already closing in on her, already cutting the options available to her, the circles closing in. She would never see another mountain top.

Bullshit, she thought.

She tried to focus on Hawaii.

This island, Oahu, was dying too, though a little more slowly than she was. It had bloomed out of the sea in a fiery birth, amid gouts of lava and steam. But every year erosion dragged it down towards the water, and there was nothing, no process, to restore it.

It had happened before. There was a flaw in Earth's mantle here, a great plume of magma which had welled up steadily for a hundred million years. It had generated Oahu; right now the Big Island was over the plume, and was being pushed towards the sky by that lithic fountain. But the relentless sliding of the tectonic plates beneath the Pacific would eventually, in a few million years, take the Big Island away from the plume. The volcano at its heart would die, and the island would be abandoned to the forces of erosion.

Thus there was a chain of dying islands tailing off to the north-west, Oahu and Kauai and Niihau, and beyond that a trail of corpses, nameless undersea mountains, each of which had once been a paradise of forests and beaches, just like this one.

Somehow it seemed an appropriate place to come to talk about the death of Venus.

Alfred returned, bearing two immense cones of ice cream. He was wearing a broad, floppy hat, a garish shirt, and shorts that made his legs look as if he had spent ten years in space.

They found a seat, and ate up the ice cream companionably.

Small talk: *How are Garry and your grandkids? Fine, Alfred, when I get to see them ... he's flying out of Edwards now ... I don't think Jenine is enjoying life as an Air Force wife ...*

She let her attention drift. A part of her mind was already composing the report she would have to pass up to the Administration.

She wondered about telling the President about the funny physics results. Was it appropriate to include something so exotic, something nobody yet understood, something it wasn't even possible yet to check?

On the other hand, she thought bleakly, suppose Alfred's wilder speculations have some bearing on reality. If there is something loose in the Solar System, something *transforming*, something powerful enough to destroy a planet like Venus – won't it be seen immediately in terms of a threat to the Earth?

And if it was a threat, how could they possibly deal with it, even recognize it?

'You know,' Alfred was saying around his ice cream, 'no matter what the other implications of this event, one thing's for sure.'

'What?'

'We've lost Venus. Forever. Although I suppose the truth is we lost it a long time ago, when the first space probes got there. I'm old enough to remember –'

'You're younger than *me*, Alfred.'

'– when Arrhenius's theory was still the paradigm. He thought the clouds were water droplets. The land was choked by swamps. A hothouse, with amphibians and dinosaurs and cave men. Even later, when it became clear from the spectroscopic evidence there was no water in the cloud tops, we still thought there might be a loophole. Maybe a world-spanning ocean of Perrier water. Or seas of oil. Why the hell not?

'But when the Mariners got there, what they found was a big disappointment.' He shook his head. 'But it needn't have stayed that way. All those stupendous schemes to terraform Venus the fringe types cooked up. You'd have to block out the sun, and let all that carbon dioxide liquefy, strike it with comets to spin it up and bring in water –'

She laughed. 'What bull.'

'But just think what you'd finish up with. A planet much more like Earth than Mars could ever be: continents called Aphrodite and Ishtar, oceans called Guinevere and Niobe; even enough geological activity to sustain a biosphere for billions of years.' He sighed. 'It was always remote. But it was *possible*. Maybe that is why Venus was put in the Solar System in the first place.'

She eyed him. 'As a place for us to colonize?'

‘Why not? But now, it’s *gone*. Taken from us ...’

‘You sound as if you’re mourning. Mourning a planet.’

‘A whole world has died here, Monica. Everything we could have learned from it, all its future possibilities lost, for all time. A *world*. What more appropriate object of mourning is there? ... Maybe we ought to hold a wake. A global wake.’

She shivered, despite the warmth of the day. She was aware of Alfred watching her with barely concealed concern, but she had no time for that.

She looked around the bright sky for Venus, but it was either below the horizon or lost in the glare.

## 4

Henry Meacher flew British Airways direct into Edinburgh.

His ticket was for what BA called World Traveller Class, which meant, essentially, steerage. Henry found himself in a middle seat in the central bank of four, a long way away from the 747's tiny windows. The stewardesses, expertly encased in make-up, were all anorexic-slim English girls with what he thought of as cut-glass accents; they walked as if their orifices were all sewn up. The distant communal video screen showed a BBC news round-up preceded by a tourist's-eye view of the alleged ancient beauties of Britain; a little menu card told Henry he would be eating a roast beef dinner – American beef – and, later, a traditional English breakfast.

Henry buried his face in the *Journal of Geophysical Research* and tried to ignore all this fake Englishness. It was like a chintz spread thrown over the battered American engineering of the aircraft. Who did they think they were kidding?

BA irritated him. The Venus scare had caused a huge curtailment in long-haul flights, so every airline was suffering – the rules about every passenger wearing a radiation exposure dosimeter badge had seen to that – but even so the length of queues BA maintained at check-in astounded him. But they pretty much seemed to have a monopoly on direct flights to Britain aside from into London, so BA it was.

The flight was late leaving Houston Intercontinental. An O-ring on one of the ageing 747's engines had to be replaced, and the engineers, worryingly, seemed to have trouble finding the right inspection hatch.

The seat next to Henry was occupied by a USAF airman who was stationed at a base in Suffolk. He was returning with his two kids from leave in Texas, and he was homesick before the Boeing left the ground. 'The bathrooms in Britain are just disgusting. Even the hotels. They just never heard of sanitary seals. The Germans aren't so bad with the bathrooms. But the French, my God, one place we stayed there was just a hole in the ground you were supposed to squat over ...' Bathrooms on planes and on trains and in stations and in hotels, bathrooms in Britain and Italy and Greece and Sweden. It was, Henry realized with dismay, nothing so much as an asshole's travelogue of Europe.

And after a couple of hours, the plane had metamorphosed, as ever, to a giant, stinking pig-pen in the sky, and every toilet Henry tried had a sticky floor and an overflowing trash can.

They flew out of bright morning light, from the west, towards Edinburgh. Henry peered out a window near the stewardess' station, and took his first look at Scotland.

He was descending into the Midland Valley, a broad belt of lowland that stretched from Glasgow to Edinburgh. This was actually what geologists called a graben: a rift, a block of land that had dropped between two faults. He could see the roads from England, to the south, sweeping down out of the hills to the valley floor, which was settled and arable, coated with picture-book fields and towns, though he could see, in some places, the scars left by Venus: failing crops, fields left brown and bare, a portent of troubled times to come.

But what made this valley different were the extinct cores of old volcanoes that stuck out of the ground, remnants of a volcanism spasm three hundred million years gone. The cones were an uncompromising demonstration of the old geologist's saw that the stuff that's left sticking out of the ground is harder than whatever has been worn away.

And as he descended towards Edinburgh itself he caught a glimpse of Arthur's Seat, a composite volcano that was the greatest of the volcanic plugs; the buildings of the old city lapped around its flanks.

He landed at 7.00 a.m. local, having missed an entire night out of his life. A bright early spring day stretched ahead of him, and he felt like a piece of shit.

'The name's Mike Dundas.'

The kid was waiting for Henry at the departure gate, when he finally got through queuing to have his passport checked.

Henry shook his hand. 'We e-mailed. Good to meet you, Mike.'

Mike took Henry's bag, a wheeled suitcase, and hauled it away through the terminal towards the car park. Mike was a technician in the University geology department here; he was in his early twenties, with – to Henry's eye – brutally short-cut hair, a disconcertingly pierced nose, placid blue eyes. He wore the bright Day-Glo sunscreen popular with the young around the world, huge dabs of orange and yellow on his nose and cheeks. His accent was distinctly Scottish, but gentler than Henry had expected – lots of strong r's, 'ye' for 'you', 'tae' for 'to', and so on. No big deal.

'The rock's already here,' Mike said.

'The rock?'

'86047. The Moon rock. We've set up our sample lab. I don't mind telling you we're all excited about this, having the rock here.'

'It'll be glad to know it's a celebrity.'

Mike looked cut by the mild sarcasm, and Henry instantly regretted it.

'I'm sorry,' Mike said. 'We're glad to welcome you too, sir.'

'I know what you meant, Mike. And for Christ's sake call me Henry; you make me feel old enough as it is.'

'I'm sorry.'

'Stop apologizing, already.'

'I'm –' Mike laughed, and seemed to relax a little. 'You're the boss.'

Mike's car, in the multi-level airport car park, turned out to be a small, battered Rover. Henry, unfamiliar with the Brit numberplate system, couldn't tell its age, but he was willing to bet it hadn't been radiation-proofed according to the new international code. There was room in the trunk – no, the *boot* – for Henry's luggage, but Mike had to clear boxes and papers off the seats before Henry could sit down.

'Sorry,' Mike said. 'I wanted to pick you up myself. But the car's always full of shit.'

Henry shrugged as he buckled up his seat belt. 'We're geologists, remember. Geologists live in shit. It's in the job description.'

'Here.' Mike handed Henry a cardboard carton of orange juice.

'What's this for?'

'Jet lag. I know how it feels.'

Henry grinned, and held the carton to his mouth.

Mike queued his way out of the car park, and set off along the freeway – *motorway* – towards central Edinburgh, eight miles away. The sky was blue, fresh, marked by a few moist-looking cumuli; but, when Mike opened a window, it was *cold*.

He became aware that Mike hadn't spoken since the airport. Mike seemed to have picked up Henry's inner sourness; maybe the poor kid thought Henry's mood was somehow his fault.

'So,' Henry said with an effort. 'What's the shit, specifically? The boxes in the car.'

'Oh,' Mike looked vaguely embarrassed. 'They're for my sister. I get her samples through my buddies at the University. She sells rocks.'

'She's an academic supplier?'

'Not exactly.'

'Oh. Don't tell me. Not rocks; *crystals*.'

Mike shrugged. 'She knows more about geology and mineralogy and stuff than she admits. But she has to make a living.'

'So, what about you? You have a pet rock at home?'

Mike laughed. 'No. But I have a rock collection. I started when I was a kid. The first item was a piece of basalt from Arthur's Seat. When I was a schoolkid I joined a local geology society. Field trips to the Pentland Hills, and stuff.'

'Sounds fun.'

'You know, Edinburgh is the home of geology –'

'So they tell me.'

Mike looked embarrassed, and again Henry found himself absurdly regretting his sharpness.

'Go on,' Henry said. 'So you wanted to be a geologist.'

'I never got that far.'

'As far as what?'

'As taking A-levels. The exams that would have got me to University.' He shrugged. 'But I learned a lot about rocks. I was always good in the field, and I turned out to be good in the lab. I got a job as a technician in the geology department here.'

'You could study. Do some kind of correspondence thing.'

Mike flashed a weak smile. 'I'm happier with the rocks.'

'Especially Moon rocks, huh.'

'Oh, yes. Especially the Moon rocks.'

To Henry the British roads looked clean, wide, kind of crowded; this was indeed a small island, he thought. The exit ramp from the motorway was a baby-gentle curve, signposted miles in advance. They emerged onto a roundabout, a system of ordered chaos, with an unspoken etiquette about giving way Henry was going to have some trouble mastering. Not to mention the fact that Mike was sitting on the right, and the roundabout traffic turned clockwise, counter to the way God intended humans to travel ...

Henry felt irritated by all this. He wasn't interested in learning about the eccentricities of the British road system. The truth remained that he didn't want to *be* here, and still wouldn't even after he got past his jet lag. He let himself get annoyed at Edinburgh, Scotland and Britain, however unfair it was.

They entered the city itself. Henry's immediate impression was bustle, colour, lovely old sandstone buildings, hills everywhere.

Mike, following the traffic along a broad, sunlit shopping street, turned towards the train station. 'Your hotel's the Balmoral. Kind of swank. We checked you in here until you find somewhere more permanent. NASA are paying ...'

Henry peered gloomily at the hotel, a sandstone pile punctured with slit windows, topped by a huge, fairy-cake clock tower. Builders were working on the roof, adding what looked like a layer of radiation-proof lead shielding. Overall, the hotel looked like a prison.

He checked his watch: 9.00 a.m., British time.

'How far are we from work, Mike?'

He shrugged. 'A few minutes. Do you want to check in first, freshen up –'

Henry scratched the stubble on his cheeks. 'Hell, no.' He grinned. 'First impressions are vital. Let's go see that Moon rock.'

Mike pulled away from the kerb.

The Edinburgh University Department of Geology and Geophysics turned out to be part of a sub-campus called the King's Buildings, a couple of miles south of the city centre. Most of the science and engineering departments lived out here, Henry learned, along with a couple of government research institutes. The department itself was housed in a building called the Grant Institute of Geology, a blocky 1930s frontage with rambling modern extensions to the rear.

The suburbs of Edinburgh ran away to the north. To the south there was an open area, trees and grassland, that turned out to be a golf course.

From Mike, Henry learned that Edinburgh was in fact pretty much ringed by golf courses.

When Henry and Mike walked up to the entrance a couple of undergraduates came out, carrying notebooks. They both seemed to have pierced tongues – *my God* – and, in their lurid war-paint sunscreen, to Henry they looked about twelve years old.

There was a security check at the door. Henry signed the book, alongside where Mike had already filled in his name for him. He'd spelled it wrong: HNER Y.

*Oh*, Henry thought.

The entrance hall was 1930s grandiose, but its glory was faded. There were portraits of the department's great men on the walls, and three granite slabs with lists of former professors. But the slabs weren't up to date, and the hall was cluttered with a couple of fish tanks and a small seismology station. Mike shrugged. 'We've been putting in stuff for the undergraduates. That's a salt water aquarium over there, and this seismology station is live. Educational. But we have to scramble for the funding. And it costs a couple of hundred quid for every word you get carved on those big granite tombstones up there ...'

Thus, thought Henry, times change, and not always for the worse.

Mike gave Henry a quick tour of the department.

The core of the Institute was the handsome old 1930s building, tall ceilings, oak panels, echoing; the modern extensions were cramped and rambling, with cheap ceiling tiles and linoleum floors. But, like every geology lab Henry had ever been in, the place was cluttered with samples. Even in the corridors there were big oak chests of drawers, all neatly numbered by hand-drawn labels. There were basement storage areas for the bigger samples – the foundations would have had trouble with the weight otherwise – and the rocks there were stored in open pallets or, sometimes, in cruder containers, like photocopier paper boxes. There was a cold room where ocean floor core samples were stacked up, in grimy metal tubes; Mike pointed out the department's milk store here, ready to fuel the British need for a continual tea supply.

Rocks everywhere, all carefully labelled and tracked by a full-time curator. Grad students were encouraged to discard whatever they didn't *absolutely* need for the future, but Henry knew that no geologist would willingly give up a single grain of sand.

To Henry it felt like coming home, after the crush and squalor of the plane, the jangling confusion of his first jet-lagged encounter with Edinburgh.

The clean lab, where the Moon rock would be processed, was a couple of storeys up. Henry was expecting a close cousin of the Lunar Curatorial Facility back home at JSC.

Well, there was a small, cramped airlock chamber here, a couple of wooden doors, like JSC. But there were no bunny suits or hats. It was just another lab, dusty, lined with grubby-looking wooden benches. There were fume cupboards on the walls, with safety notices, but their doors were ajar. Mike said the room had mostly been used, previously, by oceanographers looking for trace elements in sea water, like osmium or helium. At least there were steel-and-glass glove boxes sitting on the antique wooden benches, cheerfully bolted in place. And there were rocks, nondescript lumps, inside each of the boxes.

There was nobody working here right now. Too early in the morning, maybe.

'... The samples here are mostly just dummies,' Mike said. 'A couple of meteorites and stuff. We really wanted to learn how to handle the samples. The containers are under positive pressure. I mean, the interiors contain air at a higher pressure than outside, so if there is any breach of containment the lunar material would be blown outwards, rather than have earthly contamination blow inwards. By comparison, if we were looking at radioactive material the pressure would be negative – air would be sucked inside a box in a breach, so that radioactivity would be contained. We store the samples in ultra-dry nitrogen ...'

I know, Henry thought as Mike chattered nervously on. I know.

The positive pressure made the gloves, of black rubber, stick out from the boxes like questing arms, two or three feet long. As Henry walked past, the gloves seemed to bat at his chest, blindly.

‘This clean room,’ said Henry mildly, ‘doesn’t seem too clean to me. The lab at NASA is like Fort Knox.’

Mike looked defensive. ‘We’re trying to establish positive pressure in the room as a whole, but we’re having some trouble.’

‘Trouble?’

‘It’s kind of leaky. We don’t have the funding you guys have. And –’

Henry laughed. ‘My friend, I couldn’t give a rat’s ass. Moon rocks are just rocks. We’ll just roll up our sleeves and scrape off the shit. What do you say? Come on, show me one of these fancy boxes NASA has paid for.’

Mike grinned, still nervous. He led Henry to a glove box.

Henry knew from long experience that putting your hands into the gloves was a trick. You had to position your fingers over the fingers of the glove section, and then ram your arm into the aperture, pushing the glove right-side out by main force. It was easy to get your fingers in the wrong hole. And once inside the thick, somewhat stiff gloves, it was impossible to feel anything, and your hands got hot quickly. Learning to do delicate work in these things took time.

He noticed Mike had gotten his hands in there, ready to work, in seconds. Now he was picking up tools inside the box, confidently.

‘We’re working to the same standards as you do at Houston,’ he said. ‘The tools are Teflon, aluminum alloys and stainless steel. Stuff that won’t corrupt the rocks. The samples are sliced with lubricant-free handsaws and power saws, stainless steel blades edged with diamond.’

‘How do you find those things to work with?’

Mike shrugged. ‘Buggers. The lack of lubricant makes the saws heavy and difficult to work, and the blades wear out quickly. But you get the job done. You need strong arms, though.’

‘That you do.’

Mike pulled his arms briskly out of the gloves, and led Henry to the largest, best-lit case in the room, right at the centre. And there, on a small pedestal, sat sample 86047, an unprepossessing fist-sized lump of coal-black basalt, untidy and inert. Beside it rested a small plastic cube, labelled up-down and with the four points of the compass.

Mike bent to the case, and the fluorescent lighting underlit his face, making him look even younger.

‘Here it is,’ he said. ‘I can’t quite believe it’s here. That it’s – you know – *real*. That some guy picked it up on the Moon, and now it’s here.’

‘Believe it. You know about the documentation trail on these babies?’

‘Sure ...’

In principle each Apollo sample had been photographed before it was picked up off the surface. The photo was the clue to the rock’s context. For instance, the pattern of shadows from the unremitting lunar sunlight gave the clue to its orientation. Since the scientists knew exactly when the rock was picked up, and where, and how high the sun would have been in the black lunar sky at that moment, they could position the rock in a strong light to recreate the shadows in the photograph, and so work out the rock’s precise orientation. Then they photographed the rock again alongside the small dice-like orientation cube. The cube stayed with the rock forever after. All this was important because, for instance, the underside of the rock would have been protected from the sun, and so processed differently.

‘... Great theory,’ said Henry sourly. ‘But it heads out the window when your astronaut fouls up. The orientation we have here is just a best guess. Shit. This rock sits there a billion years, waiting to be found, and we screw it up in the first second of contact ...’

Two people bustled into the lab: a greying, portly older man, and a woman of about twenty-seven.

The man shook Henry’s hand. ‘Dr Meacher.’



‘Henry, please.’

‘Dan McDiarmid. I’m heading up the investigation here, from our side of the pond. Welcome to Edinburgh.’

‘Good to meet you, Danny.’

McDiarmid flinched but held his ground. ‘We weren’t expecting you quite so – informally.’ He was eyeing Henry’s stubble.

There wasn’t a trace of Scottish in his accent, as far as Henry could tell. He knew the type, he thought. His creative days long past, McDiarmid had used whatever reputation he had earned to win power and wealth, to turn himself into a Great Man.

Authority. The antithesis of science.

Now the woman pressed forward, thin and intense, sharp blue eyes. ‘Marge Case,’ she said. ‘I took my degree at Cambridge, and a doctorate in lunar feldspathic breccia crystallization history –’

‘I know about your work.’ Henry noticed both McDiarmid and Case had just ignored Mike; in fact Case had literally pushed past Mike to get to Henry.

Henry retrieved his hand from Case. ‘Hey. Mike. Stick around.’

Mike turned, confused. ‘You want me to get you a coffee?’

‘Hell, no, I don’t want a coffee. Well, yes I do, but not right now. Just hang loose, bubba.’

McDiarmid said with evident difficulty, ‘We want to offer you every hospitality and resource. Marge here will work as your lead technician, and –’

‘Sorry.’ Henry reached out to Mike, got hold of the shoulder of his jacket, and pulled him back. ‘Post’s taken.’

Case looked at Mike with precisely the reaction Henry had expected. ‘But I have a doctorate in –’

‘You said already. I’m sure Mike and I can find you something to do.’ Henry put his arms around their shoulders, and began to lead them to the door; McDiarmid followed, hands fluttering over his belly. ‘We’re going to be one big family,’ Henry said. ‘Just like the Waltons. Do you get the Waltons? Now, Mike. Where do we get that coffee?’

When he was done tormenting Case and McDiarmid, he relented and let Mike drive him back to the Balmoral.

Mike drove in silence, apparently confused. Henry wondered if he was being cruel to him, in some obscure way.

Am I just playing games with this guy? Or do I really think he will do a better job than Marge Case?

Well, sure he did.

But maybe he was being too smart at filling in Mike’s life story.

Henry suppressed a sigh. When the divorce from Geena was finalized – when he learned the *Shoemaker* was canned and he was going to have to leave Houston – it was as if his life was ending. He was glad when that crummy BA 747 left the tarmac at Houston Intercontinental, because it was like a little death.

But, unlike whatever lay beyond death, Edinburgh contained people, and choices, and already, just a few hours here, Henry had, on a whim, made two enemies and one dubious friend. And for what?

Anyhow, it was done.

Mike dropped him at the hotel, and Henry lugged his suitcase inside. Mike drove back to the King’s Buildings; he said he wanted to start work, preparing for the first samples from 86047.

Henry checked in.

The room rate was quite fantastically expensive. What was it with Brit hotels? Henry wasn’t paying, but he hated to waste money; the sooner he got out of here the better.

Still, his room wasn't so bad. A big double bed – a duvet, not blankets – and a kettle and a whole stack of tea bags and a mini bar, and complimentary sunscreen in the bathroom. He was on the fifth floor, and he was looking east; he would get the sun in the morning.

He took off his shoes and his stinking socks, and padded to the window.

Looking north beyond the city's roof tops he could see the Firth of Forth, a dreamy-blue arm of the sea. Calton Hill pushed out of the foreground. Calton was one of the ancient volcanic plugs that underpinned the city. It was coated with grass, and crowned by absurd-looking classical-style buildings, such as an open portico – some kind of unfinished temple, it seemed – and a telescope tower.

Mike had been right that Edinburgh was the home of geology. The old igneous structures here had been studied right from the beginning of the discipline. In fact James Hutton in the eighteenth century, based in Edinburgh, was the first to come up with modern theories of the processes that shaped Earth – the first man in history, perhaps, to understand the extent of the vast deserts of geological time that surrounded him.

Henry wondered, briefly, how that must have felt: to be the only human on the planet who *knew* ...

I ought to sleep, he thought.

He tried the TV. There were five main channels and cable and satellite. The main channels were full of soaps and other daytime bullshit. He found a British news channel called Sky and watched that for a while, but the news meant little to him. There was a story about problems for the Government over integration into Europe, and some kind of IRA bomb threat that had caused gridlock in Birmingham, and, my God, a riot in some part of Scotland – what looked like a dire residential area called the Gorbals, in Glasgow – a spokesman who said in a thick accent, *We never accepted the Union of the Parliaments, and that's that*. It turned out he wasn't talking about the modern devolved assembly but the abolition of a Scottish Parliament in favour of a single British one, which had happened, for God's sake, in 1707. And then commentators on the Irish stuff talked about some guy called William of Orange, who had his fifteen minutes of fame in 1688.

1707, 1688. Dates from prehistory for North America, dates as remote as 5000 BC.

There was no US news at all.

He tried to remember the last British news story he'd noticed back home. Some royal bullshit, probably.

Britain, he was coming to see, was built on a long and complex history. Shame they hadn't got more of it right, he thought.

But then that was complacent. Britain was peaceful and prosperous and proud of itself and, hell, even pretty democratic. The US should last to be a thousand years old; then we'll see what shape we're in ...

He flipped around until he found CNN. Lying on his bed, he studied baseball scores, one of his routines for conning himself to sleep.

But, though he was tired, he was not sleepy, and some part of him was reacting to the fact that it wasn't even midday outside, and the day was a-wasting.

He'd done a lot of travelling in the course of his career. But he'd never yet got used to this planet-hopping.

He considered raiding the room's mini-bar. Or maybe he should go back to the institute and rattle McDiarmid's cage a little more. Or maybe he should just go find a *USA Today*.

Bored, sour, he got up, pulled on a fresh T-shirt, and walked out of the room.

He found himself on Princes Street, a broad, straight road that ran east to west. It seemed to be the spine of the shopping area, and it was crowded with traffic and shoppers. The pedestrians were all in big floppy hats and baggy white clothes with their faces smeared with cream.

The street's north side was lined with plastic shop frontages, and on its south side there was a park called Princes Street Gardens: set in a valley, crammed with monuments and features. Pretty. But, Jesus, it was *cold*, a breeze gusting down the street like it was a wind tunnel. Henry, with just his T-shirt, wrapped his arms around his chest. Maybe he'd get more tolerant to this when he got over the loss of Houston's muggy, comfortable warmth.

Anyhow, if he was lucky he'd be out of here before winter came.

He got his orientation quickly.

He could see the asymmetrical profiles of Calton Hill and Castle Rock from here, with the heart of the city stretching between them, and Arthur's Seat on the outskirts of the city, a blocky, uncompromising mound. The glaciers had flowed east over this place, scraping off the younger sedimentary rocks and leaving these three igneous plugs exposed. All three plugs had been left with a sharp western face and a long, shallow eastern debris scarp. To Henry, musing, it looked as if some gigantic explosion had overwhelmed the area from the west, leaving these tails of debris, sheltered by the plugs.

He walked to the west along Princes Street. The shops were full of the new radiation-proofed clothing lines, heavily advertised. Here was a realtor – no, an *estate agent* – with a lot of properties price-hiked because they had cellars, or room for underground development.

He passed the train station entrance and the roof of an underground mall, decorated with obscure statues of what looked like abseilers. He came to a steep road called the Mound, which twisted up the glacial tail to the Castle, a brooding pile on top of its own basaltic plug. The Castle looked as out of place, viewed from this glitzy plastic shopping area, as a bubo in the armpit of a supermodel.

He thought about climbing up there, taking a look around.

Or, he could go back to that little mall by the station, get under cover, and have a coffee.

He went back to the mall.

It turned out to be a complex of staircases and escalators and glass-walled elevators. It was brightly lit and crowded, though muzak pumped out from too many places. There were fountains, with more of those bizarre stainless steel abseilers.

At least it was warmer here. But he couldn't find anything that looked *right*. What he'd really like to find, he thought, was a big out-of-town-style Barnes and Noble, lined with books, with a fat Starbucks coffee shop on the end of it. *You're getting parochial, Henry.*

He came to a shop called The World Store. It was just the kind of place you'd expect to find in a mall like this: full of bead necklaces, wooden carvings, bamboo curtains. At the back there were shelves full of rocks: sparse metal frames lit by spot lamps, the merchandise glowing.

There was a girl behind a counter at the back, blonde and slim, sorting through some kind of box of samples.

On impulse, Henry walked in. The girl looked up, took him in at a glance – so it seemed – and went back to her rocks.

On her desk, there was a card. *THE WORLD STORE. S Kapur & J Dundas, props.* Telephone, fax and e-mail.

*Dundas.* He remembered the rocks in the car, Mike's crystal-gazing sister.

Henry drifted past the wooden elephants and pan pipes and other New Age crap, and made for the racks of minerals. It was mostly the usual eyecatching commercial stuff, sliced geodes and quartz crystals and pyrite clumps. Some of it looked native, but most of it was polished, even dyed and carved. Here was a necklace of bottle-green beads, for instance. And he found a tiger carved from a shining black rock, covered in pale grey blotches.

He looked sideways at the girl.

She was older than Mike, maybe as old as thirty, but she had the same Nordic colouring. Blonde hair tied back, revealing a composed, thoughtful face. Strong hands. Blue eyes you could swim in.

One hell of a set of cheekbones, the essence of beauty. No body parts pierced that he could see, which was a good thing. She was eating something. A rice cake, maybe.

She glanced up and caught him looking at her. She put down the rice cake.

He was holding the tiger; he fumbled and nearly dropped it.

'You pay for breakages,' she said. Her accent was the same as Mike's – soft Scottish – but her tone was cold.

'Sorry.' He put the tiger back. 'I was just thinking.'

'What?'

'You ought to put a best-before date on that tiger. Ultimately it's going to turn grey all over –'

'I know. In sixty million years. It's snowflake obsidian.'

He nodded, surprised, approving. 'You know about rocks.'

'I know my job.' Her eyes narrowed as she studied him. 'You're an American. And you just arrived.'

He faced her. 'Is it that obvious?'

She looked him up and down. 'Look at the way you're dressed. It's only February, for God's sake.'

'You don't like Americans?'

'I don't dislike them. I don't know you well enough to dislike you. Yet.'

He glanced around. 'You like rocks. I know about rocks.'

Those eyes narrowed again. 'You're a geologist.'

*Strike two*, he thought. 'Is that bad too?'

'If you're with one of the oil companies, yes.'

He shrugged. 'Edinburgh may not like me, but maybe I'll like Edinburgh.'

'Why?'

'Volcanoes and a river sound. It reminds me of Seattle.'

She snorted. 'Seattle in three hundred million years, maybe, when the volcanoes have died.'

He was impressed; that was about right.

She said, 'What have you seen?'

'Just the walk from the hotel. The Balmoral.'

She went back to her rocks. 'This is the New Town. You need to go see the Old Town before you decide you like us.'

'How new is the New Town?'

'1760.'

'Older than my whole damn country. I should have known.'

'Most things in life are older than your country.' She studied him. 'Look, are you going to buy anything, or –'

He shook his head. How do I get myself into these situations? He turned to go. The girl didn't acknowledge him.

He stopped at the door and turned back. 'Look –'

'What?'

He went back to the mineral racks and picked up the necklace of bottle-green beads. 'Do you know what this is?'

'Peridot,' she said.

'Well, yes. The gem form of olivine. And that's what the lithosphere and asthenosphere are made of. That is, the solid layers that hold in the liquid interior of the Earth. So olivine is important stuff.'

She took it dubiously. 'You want it wrapped?'

'No,' he said. He dug his hands into his pockets, seeking money. 'Take it. As a gift.'

She pushed it back over the counter. 'Stuff it up your jacksie.'

‘I mean it. No strings. I want to apologize. I’ve done nothing but make enemies since I landed ...’  
He had no British money; he pulled out what he had, a crumpled roll of dollars. ‘Will you accept this?’

‘Christ. Dollars. You Americans.’

*Strike three*, he thought. ‘Here. Fifty bucks. I’m sure that’s more than it’s worth. Please. On me.’

‘Stuff it,’ she said again, but he thought he could see a smile in her face.

He left the fifty, and got out while he could.

When the door had closed and the shop was empty again, Jane Dundas picked up the fifty dollars, and the necklace, and ran the bottle-green beads through her hands.

## 5

Mike Dundas lived with his father, in the western shadow of Arthur's Seat, to the east of the city centre.

It was a fine spring morning, the sky clear and deep blue, and the air off the Firth was fresh and cool, even this far inland. So, before getting the Rover out of the garage to drive into work, Mike put on his walking shoes and set off to the Seat.

He walked east around Queen's Drive, the road which skirted Holyrood, the park that contained the Seat. He reached the entrance opposite the Palace of Holyroodhouse, the Edinburgh seat of the royals. Holyroodhouse was a twee picture-palace, shut away behind railings; Mike had grown up in Edinburgh but had never been tempted to go visit it.

He set off up the Volunteer's Walk to the summit of the Seat itself.

Everyone but the tourists knew the Seat had nothing to do with the English King Arthur, but was named from Gaelic: *Ard Tor* – the Height of Thor.

The climb, he knew from a lifetime's experience, looked a lot stiffer than it was. The grassy ground was dark, still in the shadow of the turning Earth, even though the sky was already bright; and the dew made it a little slippery underfoot. The path was heavily eroded – too many visitors – but the climb was one Mike had been completing since he was a kid, and it didn't take long to reach the broad, flat summit.

He stood on the red-brown, lumpy rock here. The rock was agglomerate, the exposed neck of the old volcano. There were two summit monuments up here, sparse concrete blocks.

He was alone. The Seat attracted few tourists, compared to the Castle Rock anyhow; mostly you saw locals, dog-walkers.

He turned slowly around. From here you got a panoramic view of the city and its environs, nestling around the volcano plugs; Arthur's Seat was the highest hill in Edinburgh.

He could see the Pentland Hills to the south, the central lowland plain stretching off to the west, and the river to the north, the city splashed along its southern coast. He could make out the docks and the twin stacks of the Port Seton power station; the water beyond looked so flat and still it might have been moulded from steel. And there was the rocky northern coast of the Forth; on a good day you could see the peaks of the Highland massif, all of seventy or eighty miles away.

Venus was setting, but it was still bright enough to cast a reflection from the small waves on the Forth.

The air, blowing off the Forth, was fresh and laced with salt; he breathed it deeply, swinging his arms, invigorated, exhilarated.

All this out of his back door, and a Moon rock waiting for him back at the lab. Already he had more than a good feeling about how his relationship with this Henry Meacher was going to pan out. God, he thought, I love this job.

But first, he had to see his sister. He patted his pocket, to make sure the little vial of dust he had secreted there was safe.

Then he made his way down Arthur's Seat, by a different track.

He descended towards a sandstone ruin called St Anthony's Chapel.

This was a grey heap of rubble not far below the summit of the Seat, in the lee of an exposed crag; time had left one wall intact, with a door and window gaping into nothing. The chapel was thought to date from the fifteenth century, but nobody actually knew; Edinburgh's history had been chaotic.

As he headed towards the Chapel, through a steep-walled old glacial cwm called the Dry Dam, Mike could hear a single voice – a man's – floating into the morning air.

‘... I want to tell you the story of the original Bran. With twenty-seven companions, he was lured away to a place called the Land of Women, an island supported by four pillars of gold. There was a great tree full of sweet singing birds that was permanently in blossom, and the air was full of music ...’

Mike, descending into the Dry Dam, saw that the speaker was a kid – seventeen or eighteen, hair shaven, so skinny the bones showed in his face and skull. He was dressed in what looked like purple pyjamas. He was sitting beneath the steep rear wall of the cwm, as if cupped by the geology; there were maybe thirty people sitting in the grass in a circle facing him. They were all clean-shaven, with close-cropped hair; they were slim, even gaunt-looking. Mike, in fact, had trouble telling the men from the women, even what age they were. They were all wearing the purple jim-jams, as far as Mike could tell, and they must be cold – he could see where the morning dew had seeped into the thin fabric of their uniforms – but they didn’t seem to be reacting to it. They looked relaxed, obviously fascinated by what the speaker was saying.

Beyond the pyjama party there was a thin, scattered circle of onlookers, dog-walkers and ramblers, a few tourists. Amongst them he could see Jane, in a woollen hat and sheepskin jacket.

The speaker’s voice echoed around the natural amphitheatre.

‘... Bran landed. There was a bed – and a wife – for each man, and the food and drink were constantly replaced. Bran’s men stayed in this wonderful place for what they thought was a year – but when they returned home, they found a *hundred* years had passed. Nobody believed he was Bran, who they only knew as a distant legend. Bran was forced to sail away, into oblivion ... Come.’

Mike started; he hadn’t been hiding, but it wasn’t obvious how the speaker could have spotted him. But here he was, waving a skinny arm at Mike.

‘Come and join us. You’re very welcome. Everyone’s welcome to listen.’

Mike would have backed off, but there was Jane, waving at him. So he nodded at the storyteller, and stepped cautiously through the pyjama party circle, and crouched in the damp grass close to Jane. She was wearing a bottle-green necklace he hadn’t seen before.

‘I’ve got something for you,’ he whispered.

She raised a forefinger to her lips to shush him.

‘... Now you can see why I took the call-sign I did: *Bran*.’ The kid looked around his flock; some were nodding, but others looked a little confused.

‘Think about it,’ Bran said. ‘The pillars of gold, the birds singing – the sort of lurid detail you’d expect after three thousand years of retelling. But what about the replenished food and drink? What does that sound like, to you, but *replicator technology*?’ He opened his hands, rested them on the back of his folded legs, and looked around the group, nodding persuasively. ‘Just like *Star Trek*. Right? And what about the women that just happened to be available for every man? Were they just hanging around, waiting for visitors? Isn’t it more likely that these were some kind of constructs – what we might call holograms, or even androids?’

‘Which is why, of course, we find all that sci-fi stuff so easy to accept. Because it’s not part of our future – *it’s part of our past*.’

Jane leaned to Mike and whispered, ‘Here comes Einstein.’

‘What?’

‘Wait and see.’

‘What is this?’

‘A staff meeting of Egress Hatch,’ Jane hissed back. ‘Morning prayers.’

‘Egress Hatch? That new cult?’ He’d heard pub talk about this; the cult had come out of nowhere to gather, apparently, a couple of thousand adherents in a month. But then, since Venus, it seemed as if the whole human race was splintering into cults and enclaves and pressure groups ... He studied his sister. ‘What are you doing here?’

She frowned. ‘I think I know *him*.’ She pointed at Bran.

‘... And, of course, the clinching element in the whole story is the time lag. A century passing on Earth for a year of the travellers’ time! It’s just the twin paradox of relativity – the time dilation effect suffered by every interstellar traveller up to, but not including, Captain Kirk – *foreshadowed in a story first told three thousand years before Einstein was born*. Now, how can that be? ...’

‘I told you,’ Jane whispered.

Bran’s sermon was a mish-mash. The underlying theology seemed to be Celtic, but it was mixed in with a bit of New Age, a bit of post-millennial anxiety, a lot of sci-fi stuff about UFOs.

‘... Our faith is rooted in that of the Celts. But this was the native religion of Britain and Western Europe, before it was suppressed by the conquering Romans, three thousand years ago, and then absorbed by Christianity, and so emasculated. Now, we’re reclaiming it ...’

Mike straightened up to speak; he could feel Jane plucking at his sleeve, but he ignored her.

‘So what’s that got to do with spacemen?’

Bran smiled. ‘The old religion, long buried, is a memory of an even older human experience. It’s only now, in our modern age, we can make sense of it. Look – have you ever had the feeling that your conscious self is sitting somewhere inside you? Like an inner person in a vehicle, looking out on the world and controlling the actions of your body –’

‘Like the Wizard of Oz?’

That got him a laugh from the outer fringe. Bran laughed along with them. ‘Something like that. Well, that’s a common feeling –’

‘A common illusion –’

‘Because it’s based in reality.’ Bran patted his rib cage. ‘*These* are not our true bodies. *This* is not our native world. We believe that we are from somewhere else, and we’re destined to return.’

Intrigued despite himself, Mike asked, ‘So what are we doing here?’

‘We are on an EVA, as the astronauts would say: an extravehicular activity. And these, our bodies, are like spacesuits we put on to preserve us here, on this alien world. We were an away team, so to speak. Or our remote ancestors were. But, long ago, we forgot what we were doing here. We forgot how to get back. Do you see?’

‘You’re speaking by analogy,’ Mike said.

Jane covered her mouth with her hand. ‘Mike, for God’s sake –’

‘You can prove anything by analogy.’

‘But,’ Bran said mildly, ‘I don’t need to prove anything. It’s simply an expression of our common experience. The lost legend of the ship – the place we came from – transmuted into myth, even as we went native ... Listen: our brains, the electrical impulses that flow through them, have nothing to do with *us*. Any more than the computer processors in an astronaut’s spacesuit are in any way part of *her* ...’

‘Jesus,’ Mike said. ‘He’s a crack-pot.’

‘He’s Hamish Macrae,’ Jane whispered.

‘Who?’

She told him about the kid in the Cordley Road lift shaft, Jack’s friend.

‘And suddenly,’ Jane said, ‘he’s Bran. I saw his picture in the paper. I just wanted to see what he was up to. He’s clever. I’ll give him that.’

‘He’s just working through what happened to his brother. He’s crazy.’

She eyed him. ‘We’re *all* crazy, Mike. We always have been. At the end of the second millennium we were all just as crazy as at the start. We all believe *something*. And it’s all started up again thanks to Venus. Funny lights in the sky ... My view is, if you’re going to spout craziness, it might as well be something harmless. At least Bran and his people don’t hassle anyone else. Unlike some I could mention.’ She told him about the American who’d disrupted her lunch yesterday. ‘I think he was with the oil people. Arsehole.’

Mike frowned. ‘What did he look like?’



‘Tall. Skinny. In a T-shirt, of course. Wild-eyed, hairy.’

Henry. ‘You’re sure he was with the oil companies?’

‘No, I’m not sure. Why?’

‘No reason.’

She fingered her bottle-green necklace. ‘The arrogant arsehole paid for this with dollars, in cash. As if we’re the fifty-first state already.’

‘But you’re wearing it. Did he give it to you?’

She looked defensive. ‘Well, he had bought it. If I’d put the necklace back in the stock I’d never have reconciled the books –’

‘Of course not.’

She studied him suspiciously. ‘Why are you so interested? Do you know this guy?’

He shrugged. ‘How could I?’

A shadow fell across them. Mike looked up.

The leader of the pyjama people, Bran, was standing over them. Looking beyond Bran, Mike saw the various groups had broken up; the pyjama people were standing in a knot, talking quietly.

‘You were persuasive,’ Bran said to Mike with a rueful good humour.

‘Thanks.’

‘Come to our Belenus festival.’

‘When’s that?’

‘May Day. We’ll hold it here, on the Seat.’

‘Will there be replicator food and a woman for every man?’

Bran laughed. ‘No, but there will be spectacle. And oatcakes. Mustn’t forget the oatcakes.’

‘Do I have to wear pyjamas?’

‘Pyjamas are optional. Will you come?’

‘I don’t know. All that stuff you were saying sounded –’

‘Cracked?’ Bran smiled sadly. ‘But I have proof.’

‘Proof?’

For answer, Bran turned and pointed to Venus.

Mike and Jane strode back up the flank of the Seat, towards the summit. They found a place to sit on the agglomerate, looking north over the city.

Mike, agitated, disturbed, said, ‘You know, that guy was in control from the moment he walked up to us. Even before. He used everything I said to make his case stronger.’

She shrugged. ‘That’s what it takes to be a cult leader, I suppose.’

‘He ought to be a politician.’

‘Oh, I think he has his eye on higher goals than that ... You said you wanted to see me.’

‘Yeah. I have something for you.’

He glanced around to ensure they were alone. A couple of walkers, a hundred yards away; the steady susurrus of noise from the city.

Pleasurably anticipating her reaction, he dug into his pocket, and pulled out his phial. It was just a small plastic test-tube, stoppered with a rubber bung.

He held it up in the morning light so she could see. There was a little puddle of dust in its base, a handful of grains. It was coal black, and when Mike shook the vial the dust clung to the sides.

‘It sparkles,’ Jane said.

‘That’s the glass in it. Shards of it, from volcanic activity and meteorite impact –’

‘Mike, what is this?’

He grinned. ‘Can’t you guess? Look, no one will ever know. Whenever you take a power-saw sample from a rock there’s always a little wastage. A few grammes. There has to be – the rock just crumbles. They expect it, when they reconcile the weights later. I was just careful to capture every loose grain. And here it is. I even pumped the vial full of ultra-dry nitrogen to keep it pure.’

‘Are you telling me this is *Moon dust*?’

She looked – not pleased, not awed, as he’d expected – but horrified.

‘Well, yes. That’s the point.’ He frowned, puzzled. ‘Don’t you want it?’

‘You’re giving it to *me*? Mike, what the hell am I supposed to do with it?’

‘I don’t know.’ He shrugged. ‘Give it to Jack. Put it in a locket. Sell it, to someone who will appreciate it.’

‘Mike, you’ve brought me a lot of stuff in the past – stuff I could never have gotten hold of otherwise – but this is different.’

‘Why?’

‘Because it’s against the law.’ She looked into his eyes, the way she used to when he was a kid. ‘You must have let someone down, to take this.’

‘What?’

‘Someone who trusted you. Someone who gave you responsibility.’

Shit, he thought. ‘... I suppose so.’

She pushed the vial back into his hand. ‘You’ll have to take it back.’

‘I can’t. What do I do, glue it back to the rock?’

‘You can’t keep it, Mike.’

‘It’s *Moon dust*.’

‘Even so.’

He hesitated.

‘You know I’m right,’ she said.

‘Oh, Christ. I hate it when you’re right.’

‘That’s what big sisters are for.’

He took hold of the rubber stopper. ‘You may as well look. You’ll never be so near a piece of the Moon again.’

She crowded close.

He pulled out the bung; it came loose with a soft pop.

She sniffed the vial. ‘I can smell wood smoke.’

‘That’s the Moon dust. It’s never been exposed to free oxygen before. It’s oxidizing. Burning. Here.’

He tipped up the vial, and tapped its base; the Moon dust poured into Jane’s palm. It was just a few grains; there really was hardly any of it.

Jane pushed at it with the tip of her little finger. ‘It’s sharp. Like little needles.’ She lifted her fingertip and inspected it. ‘It’s stuck to my skin. Oh, well ...’

She tipped her hand, and let the grains scatter. They sparkled briefly before dispersing.

Talking, arguing, they made their way down the flank of Arthur’s Seat, towards the Dry Dam. Above them, the sky brightened.

... They were just grains of basalt, falling through the air.

A little piece of the Moon, come to Scotland. But, though different from any terrestrial samples, the grains themselves were unremarkable.

They fell now to a massive plug of agglomerate. They would not be found again, by the most determined petrological inspection.

... Except that where they fell, the bare rock glowed, softly silver, in spots a fraction of an inch wide.

## 6

The debriefing session for Geena's mission was held in the Teague Auditorium in JSC Building 2, the Public Affairs Office. Geena had to sit behind a desk on a stage with the four others from her crew, bathed in the glare of TV lights. As clumsy young sound technicians tried to fix microphones to their lapels and ties, the astronauts chatted awkwardly, like newsreaders under the credits.

Geena had to shield her eyes to see the audience. She could see the platform on which the NASA TV cameras were mounted, and before it a thin scattering of journalists – mostly science correspondents, mostly men, mostly bearded, many of them familiar to her. This briefing wasn't a formal press conference but had become a post-flight tradition; the idea was for the crew to come share their experience with colleagues and families. So there were engineers and controllers and mission managers from Mission Control and the science backrooms, here at Houston, and some pad technicians and managers from the Cape; but there were also grandmothers and little kids, relatives or friends of the crew.

There was nobody to see Geena.

That was her choice. Such events made her cringe, without her mother wanting to muscle in too.

It was a sparse crowd, and it looked as if today the audience was filled out with a tram-load or two of spectators from the Space Center, the flashy visitors' centre on the edge of the JSC complex. The gaggle of tourist types sat together in their slacks and T-shirts, cameras dangling from their necks.

At last the proceedings began.

First there was a long ceremony of team awards, presented corporate-style by the director of JSC. Every astronaut who flew got a 'Spaceflight Medal' specific to the mission, pinned on her chest. When it was her turn, Geena got up to a ripple of polite applause, her palms sweating, suddenly as nervous as a grade school kid on show-and-tell day.

The Center director was a man called Harry Maddicott, somewhere in his sixties, hair slicked back, waistcoat stretched over an ample gut, fat and sleek and self-satisfied as a seal. He grinned at her as he pinned her medal to her suit jacket lapel, taking obvious care not to let his hands stray anywhere near her breast.

Next came the awards for the mission controllers, 'outstanding performances' by the Flight Dynamics Officer and the Guidance, Navigation and Control Officer and even the Public Affairs Officer. There were awards for the guys who planned the EVAs, the mission's spacewalks – even though the EVAs, which Geena had been scheduled to take part in, had both got cancelled because of a loose screw that stuck the Shuttle orbiter's hatch mechanism.

Then, to Geena's embarrassment, she was called up again. She was given an EVA credit because – Maddicott said – she and her partner had got suited up and taken to vacuum, even though they never left the vehicle, and that counted for the record. Then the mission commander got up and gave the two of them a special award: the balky screw, smaller than her thumbnail, that had fouled up the hatch. It was wrapped up in a plastic bag, for them to saw in half and mount on wood, half each.

It was moments like this that made her realize what NASA was really all about: it was forty years old now, a well-entrenched piece of Government bureaucracy, where ceremonies like this were an essential part of motivation, the little plaques and medals and in-jokes a measure of the development of your career.

All the applauding NASA managers here seemed to be white males, it struck her, even though the astronauts, the showcase, were a reasonable mix of ethnicity, creed and sex. Many of the managers were of that sleek rotundity that comes to men of bulk and stature in such positions. Men of influence. She looked at Harry Maddicott, for instance. With his jowls grey and dragged down by gravity, it was difficult to remember that he had only been in his twenties during the era of flower power. How had

he looked then? And yet now he had seamlessly become the kind of man who seemed to emerge from each generation to run the country, as long as Geena had been alive, and probably a lot longer before.

The inevitability of her own likely metamorphosis with age, into some female equivalent of Maddicott, depressed her. Well, Henry probably thinks I'm there already.

She tried to pay attention to the continuing presentations. There was a slide-and-video show of highlights of the mission. Images of the Mission Control Center here at JSC, guys sitting at their blue workstations with their jackets over the backs of their seats, scratching their bellies and working with mind-numbing slowness. The Shuttle's docking with Station was more fun to watch, with intercuts between computer graphics of the converging spacecraft and the Station docking adapter making a slow geometric sense, the Shuttle flying up an invisible cone to its target, the black dots of the adapter's Space Visioning System which helped the computers bring the huge spacecraft together. But this too proceeded with glacial slowness, the two huge machines converging at no more than an inch a second.

Now there were pictures from their stay in orbit on Station, usually of an astronaut – sometimes herself – struggling with some incomprehensible piece of equipment in a cluttered interior.

Here was Bonnie Jones, the other woman on the crew, floating around the Shuttle with her long greying hair loose and in a fan around her. As a crewmate, that had driven Geena quickly crazy. Of course the media outlets loved it; Henry told her there had been at least two daily occurrences of 'bad hair day' jokes. Later in the mission, Bonnie had tied her hair into a rope-like ponytail, which swung around behind her. The novelty of *that* wore off after the first crew member got a hairy slap in the face.

Geena was, of course, all for equal access to space. But she thought women like Bonnie ought to cut their damn Barbie-doll tresses to a crewcut for the duration; that wasn't such a sacrifice.

The show limped on. The movement of objects in zero gravity, a milky-slow ballet, had some appeal. But the audience started getting restive, the kids and old people bored. The fact was, the novelty of watching nondescript people performing incomprehensible tasks soon palled, zero gravity or not.

There was a brief sequence of Arkady Berezovoy on board Station, using a Station power tool, floating upside down. He grinned out of the screen, it seemed directly at her. He spoke to camera in his thick, earthy, accented English: *It was like a dream when Shuttle came floating up to Station. Last night I slept on the Shuttle for the first time. It was unusual. Station had become my whole universe. After 128 days in space, I couldn't believe anything existed beyond its walls ...*

Arkady was still on orbit. Listening to his voice, Geena realized how much she missed him.

The most striking images, the ones that stunned the audience to silence, were those of the Earth: the visible evolution of the three-dimensional diorama of clouds and ocean and desert, filled with blue light, sliding past the orbiter's dinged-up wing or tail. Here was a slide taken by Geena, the shimmering blues and greens of the coastline near the Bahamas.

And now here came images from the flight deck of the Shuttle's reentry and landing. Geena's favourite showed a view from the rear windows of the plasma trail stretching behind the orbiter, a pink road reaching all the way back to Mach 25 and orbit ...

The time came for questions for the crew. Most of them came from the journalists, but given the nature of the event these were mostly harmless lobs.

*Sixt, how do you feel about your career now? Do you want to fly again? Do you have any regrets?*

Sixt Guth prepared his answer. He was an Apollo-era relic still flying at sixty-four, who seemed to be trying to defy age. It was incredible to think he was actually older than Harry Maddicott, she thought.

'I was recruited, in the 1960s, as a scientist-astronaut,' Sixt said. 'You have to understand I was actually recruited to go to Mars, maybe in the 1980s. That was what I expected, and so did everyone

else, and it was the ultimate purpose of my job. But it didn't pan out that way. At least I got as far as LEO, low Earth orbit, and I enjoyed my time there ...'

Sixt had actually completed seven flights already and was hoping for more. He was an obsessive learner, having taken at least five degrees in with his two-year stretches of Shuttle training. He was undeniably *old*: he was totally bald, his head and face seemingly polished smooth. He moved with an odd gait, as if awkward in Earth's gravity, and – like others of his generation – he was, Geena thought, rather clumsy and too brief in his public pronouncements, not so articulate and media-friendly and practised as the rest of them, even Geena. She wondered briefly how they must all look to outsiders: like younger, slimmer, ethnically mixed versions of the Center director maybe, sleek and rich-looking and confident and articulate. The epitome of space travel as a career move.

It was for the sake of this corporate cosiness, she thought with uneasy regret, that Henry's mission had been broken.

Sixt fumbled with his lapel microphone. 'You ask me about regrets. We weren't ready to go to Mars, I understand that now. Spaceflight is not easy. I don't know personally how I would have fared, psychologically, if, in some other universe, I had ever gotten to do that hundred-million-mile trip to Mars. Months of isolation from my family and home, not just days ...'

*Sixt, do you still think we should go to Mars?*

'Well, I guess so. But it remains a heck of a long way to go. I've come to think we should put our hearts into a return to the Moon. Sure, the Moon's not an ideal destination. It's a desert compared to Mars. It would be better if Mars was in orbit around the Earth, just three days away, but it isn't, and we ought to make the best of what we got. But even on the Moon it might be possible to live off the land, if we're smart enough.'

And then came the questions for Geena. The first couple were about her last flight but two, the first by an all-woman crew in US space history. It seemed to have aroused as much interest and curiosity as if NASA had appointed a team of chimpanzees to make the flight. But Geena had gotten used to handling those questions now.

After that, they got tougher.

*Your husband thinks there's an ocean on the Moon, doesn't he?*

Gentle laughter.

'Not an ocean.'

*But enough to flood the Moon, if it was all melted. Is that right?*

'It's a possibility.' She smiled tightly. 'I don't pretend to understand the theory of how it got there. But it seems possible.'

*Geena, do you think NASA should have brought the astronauts home from Station?*

'No. The evidence we have is that the radiation pulse from Venus was transient. The danger's already over ...'

*Geena, I can't help notice Dr Meacher isn't here.*

Sixt tried to help out. 'Nor are my ex-wives. Attendance isn't compulsory, thank God.'

That got a laugh. But the questioner, a journalist, was persistent. *You didn't back his Shoemaker proposal. We hear he's leaving NASA over it. Is there any bitterness between you?*

She was aware of a shift in the body language of the crew up here on the stage, the managers, the rest of the audience. Everyone was quietly waiting for her answer, as always fascinated by some other poor sap's domestic difficulties.

'There's no bitterness. Henry and I have our separate careers. Even when we were married, that was so. And now our marriage is over, but the break-up had nothing to do with our differences over Agency policy. I hope that answers you.'

It was, at least, enough to shut him up. But she knew – and everybody else in the room seemed to know – that it wasn't the truth.

The briefing broke up, and they were led out to an autograph session.

Later in the day, on impulse, she phoned Henry, at his hotel in Edinburgh.

‘I’ll help you,’ she said.

*What? How?*

‘I’ll find out the context. Of your rock.’

He paused. She thought he was gathering his strength, as if he was about to come back with another put-down. But then he said, tenderly, *You do that.*

Tenderly. But, she saw clearly, without love.

## 7

Mike Dundas picked Henry up from the Balmoral.

It was a balmy Saturday evening, at the end of Henry's first full week in Edinburgh, and Mike had asked Henry over for dinner. Henry had accepted uneasily. He still didn't feel much like being sociable; and besides, he wondered what horrors of northern British cuisine he was going to be subjected to.

But he couldn't see any way out of it, with grace. Mike seemed pathetically grateful to Henry for giving him the chance to work on the Moon rock. Maybe this would let the kid get that out of his system.

They drove south for a mile or so, and arrived at a small estate of identikit houses. Mike pulled up in front of one house, maybe 1960s vintage: a nondescript box, a small garden to front and back, like, Henry sensed, millions of similar suburban homes all over Britain. A little further away there were rows of tower blocks, the result of some misconceived housing policy of the recent past. Not a great place to live.

But it was redeemed by one hell of a view of Arthur's Seat, to the east.

This was actually his father's house, Mike said; his mother died a few years before.

'So who's cooking?'

'Dad. With a little help from me.'

'Oh, shit.'

Mike laughed, and locked the car.

A plastic soccer ball hit Henry in the nose.

A kid came running around the side of the house: a boy maybe ten years old, all stringy muscle and energy, his elbows and ankles sticking out of his clothes. 'Oh, bugger,' he said.

Mike said, 'Jack!'

'Mister, I'm sorry.'

Henry had to stand there and wait while the blow's effects worked their way along his nervous system, and when it reached his pain centre the agony was disproportionately huge.

Holding his nose, he waved his free hand. 'Forget about it.'

The kid retrieved his ball and ran off out of sight.

'Who the hell was that?'

'Jack. My nephew. Come on, I think you deserve a beer.'

'Damn right.'

They walked into the house. Mike called ahead, and an older man came out of the back, wearing a plastic apron with a picture of a French maid's torso on it. The apron had to stretch over the guy's beer belly. He stuck out his hand. 'Ted Dundas. Mike's father.' His accent was different to Mike's, stronger almost to the point of incomprehensibility, with half the consonants missing and every vowel distorted. He was, Mike had told him, an ex-cop.

'Thanks for inviting me.'

Ted waved a hand. 'Help yourself to a beer.' He went back to the kitchen.

Mike followed, and returned with two pewter tankards, unopened cans of beer inside them. It was the cold light ale the Brits called lager.

They wandered through the house. It was minimally furnished, a big colour TV in the living room, a sliding glass door that gave onto a brick patio, walls painted in pastel whites, a lot of brickwork throughout the house.

Henry wondered what to say. 'Tasteful.'

Mike laughed. 'You don't fool me. But thanks for trying.'

They went out through the open patio doors to the small garden. It was east-facing, Henry saw, so it was in the shadow of the house in the evenings; but it had a good view of Arthur's Seat. Henry took a couple of breaths. The evening air was fresh and cold.

They were close to the western face of the Seat here; the Salisbury Crags loomed a half-mile or so to the east, their rust-brown faces glowing with colour in the low sun.

'Oh. It's *you*.' A familiar woman's voice.

Henry turned.

It was the sister, Jane, who he had met in that disastrous encounter in her shop. She was wearing a long floral-patterned dress, open at the neck, some kind of wooden clogs, and a hair band. She was standing there holding a glass of wine, the low sun on her face. She wasn't wearing the peridot necklace, Henry realized with vague, unreasonable disappointment.

Mike stepped forward, grinning. 'Jane, meet Henry Meacher. My colleague at –'

'You bastard,' she said to Mike. 'You *knew*.' She turned on Henry. 'So did you, in the damn shop. Big joke, guys.'

Henry spread his hands. 'Believe me, I wasn't expecting you.'

'Or you wouldn't have come. Right?'

'No. I mean, yes.' He drained his beer. 'Mike, could I get another one of those?'

But Jane had turned on Mike. 'As for you, you little shit –'

Mike's grin didn't fade. 'Hello, Jack.'

Here came the kid, his soccer ball moving at his feet as if stuck there with glue.

'Kid's got a good shot on him,' Henry said drily.

'You like kids?'

'I loathe the little assholes.'

Jack laughed, and got himself a glare from Jane.

Mike touched Henry's shoulder. 'Keep that up and you'll have a friend for life.'

Mike's father stuck his head out the door. 'Snouts to the trough!'

The five of them sat around a table of some polished wood. It might even have been mahogany. But the setting wasn't too formal – plates and cutlery that didn't match, paper napkins, the table scattered with sauces and condiments and wine and beer, and a Diet Coke for the kid. The body language of the adults made it clear the soda was some kind of special treat.

Out of his apron, the father, Ted, revealed a shirt and tie. In the middle of the table Ted put out a steaming bowl of what looked like chili, some kind of minced meat with tomatoes, kidney beans, big chunks of onion; there was a choice of tortilla chips or rice. Henry took the chips, some fresh bread, and a couple of healthy ladle-fuls of the chili. He tried a mouthful; it was hot and sharp.

'I'm impressed,' he said.

Jane eyed him. 'You were expecting haggis and kilts.'

'No. I didn't think you British were eating beef.'

'Not beef,' the father said through a mouthful of chili. 'It's quorn. Meat substitute.' He slapped his belly. 'Better for you. I'd generally serve up salad but what with all this radiation you can't get fresh vegetables for love or money –'

Henry sneezed, suddenly. Then sneezed again.

Ted stared. 'What's wrong with him?'

Jane said, 'Serves him right for walking around Edinburgh in a T-shirt.'

'I get allergic.' He looked around. 'You got a cat?'

'Yes,' Ted said. 'Willis. The little beastie isn't here right now.'

'Randy little sod,' Jane said mildly, eyeing her father. 'Like his owner.'

'Don't speak about your father like that,' said Ted.

'Doesn't matter if the cat's here or not,' Henry said. Sneeze. 'One hair is enough.' Sneeze. 'Do you have any anti-histamines?'



Ted eyed him. 'Do I *look* as if I have any anti-histamines?'

The boy was staring at him. 'Do you like cats?'

'No. I loathe cats.'

'I thought you loathed kids.'

'I loathe kids and cats. I'm big on loathing. I have a dog, called Rocky. I had to find him a foster home when –'

'Are cats little assholes too?'

Jane went into glaring-parent mode, but the father was guffawing, and the moment passed.

'So,' Ted said. 'You like Edinburgh?'

Henry thought over his answer. 'I guess,' he said. 'I'm not a city guy. But it has a comfortable scale. It reminds me of Prague.'

Jane laughed. 'Prague?'

'Why not Prague?'

'Just remember,' Ted said. 'Edinburgh is all fur coat and no knickers.'

The kid giggled, and Jane said, 'For God's sake, Dad.'

'Well, it's true.'

Mike leaned to Henry. 'He's from Glasgow.'

Now the kid spoke to Henry. 'So you're a geologist too, like Uncle Mike.'

'Yeah. You want to be a geologist when you grow up?'

The kid gave him a pitying look. Jane looked amused.

Henry ploughed on.

'When I was a kid I wanted to be an astronomer. I used to hang out at weekends at the Griffiths Observatory, above Los Angeles, when my buddies were down on the beach. I even made a map of the Moon, when I was fifteen or so. But real-world astronomy wasn't for me. I think it was because nobody looks through a telescope any more. I missed the tactile stuff.' He hesitated. 'I liked the *feel* of starlight, light that was a thousand years old, tickling my eye.'

Jane cocked an eyebrow.

'And if that's too poetic for you –'

'Poetry's fine,' she said. 'Just don't make a habit of it.'

'Anyhow, I turned to geology. The world is full of rocks you can touch, after all. I majored in geology at Pomona, in Southern California, and UCLA at Berkeley and LA. At UCLA I learned to live like a geologist, which is to say,' he said to Jack, 'in the middle of messy oil fields and mines and heat, or cold, and rattlesnakes and poison oak and cow pies ...'

The kid's eyes were pleasingly round. 'Do you get to see volcanoes?'

Henry said, 'Not much. I have friends who do that. What I mostly study is the Moon. Do you know about the Moon?'

'Some.'

'During the grind at UCLA I visited JPL – the Jet Propulsion Laboratory, where they run the space probes out of, and I saw the pictures of the Moon they had there, and it was like being a kid again. So there I was. I wanted to be a geologist, working with Moon rocks. But only one geologist ever flew to the Moon, and that was thirty years ago, and there was no prospect of anybody going back soon.'

'Anyhow after that I was a little stuck. I wasn't interested in the oil companies which hire most geologists. I decided I had to bite the bullet. I had to go work for the only place specializing in Moon rocks, thirty-year-old collection or not, and that is the Lunar and Planetary Institute in Houston. NASA.'

'NASA,' breathed Jack.

'It's not as cool as you might think. What I found when I got there was they were throwing out half their collection of Lunar Orbiter and Apollo photographs, maps and mission documents. You

wouldn't believe it. I had to pull them out of the dumpster, literally, forty billion dollars' worth of trash. NASA is much better at gathering data than storing it ...'

Jack looked baffled.

Jane said, 'You don't talk to kids much, do you?'

'I know about the craters on the Moon,' Jack said. 'Like Tycho.'

'Well, that's good.'

'Are the craters volcanoes?'

'No. The craters are impact scars. But we used to think they were volcanic. You know, they took the Apollo astronauts crawling over Hawaii for their training, the big volcanic calderas there. All those lava surfaces. They thought the Moon would be like that. Wrong ... They should have stayed on the beaches; that turned out to be a closer match. Anyway I hate Hawaii.'

'Why?'

'I was once studying active lava flows there, and I broke through a solid crust and sank into molten lava up to my knees. Not pleasant. But I recovered.'

'Wow,' said the kid, round-eyed. 'Is lava dangerous?'

'No. Lava is friendly. Unless you're unlucky, or careless, like I was. You can walk around on lava. It smells odd, like scorching paper. And it moves slowly; you can get away from it. Pyroclastic flows are what you have to look out for if you're ever close to a volcano.'

'Pyro –'

'Ash.'

Ted helped himself to more chili. 'So why do all geologists look like they've been living in a hole in the ground?'

Jane laughed.

Mike said, 'They probably have, dad.'

Henry said, 'It's true. There are other types of people who study the Earth. Like photogeologists, for instance, who work from photographs, and petrologists, who treat their rocks like lab specimens, and geochemists and geophysicists. But old-time geologists will look down their noses at any of that and say, "Needs field checking". By which they mean, if you can't walk on it and rub your hands in it and get yourself good and dirty in it, it ain't geology.'

'Hey,' Mike said. 'I have a joke about that. Maybe you heard it. What's 2 plus 2? The geologist says, "Well, around 4." The geochemist says, "4 plus or minus 2." The geophysicist says, "What number do you want?"'

Henry laughed, though he'd heard it before. The others just looked baffled.

'So,' said the father. 'You divorced, separated or what?'

After the meal, Mike's father said he would wash up, and Mike and Jack went out to the garden to play some more football.

Jane and Henry sat in the living room, regarding each other warily.

Jane said unexpectedly, 'You want to go for a walk?' She stood briskly. 'We'll climb the Seat. Shouldn't take more than an hour. Unless you think that's too far.'

Henry stood. 'I'll be fine.'

She handed Henry a heavy radiation-screen poncho, and marched him out the door and down the path.

They tramped for a brisk half-mile on the road, going north-east, skirting the base of the Seat. Then they turned off and began to climb a path over the Seat itself. Soon, Henry was walking over spongy grass, with hard basalt beneath, tough through the soles of his training shoes.

The noise of the traffic diminished, and the only sounds were their breathing, growing deeper as they walked, and the soft susurrus of the wind in the grass. As the fresh air filled his lungs, even his sneezing diminished.

It was *cold*, however, despite the poncho, but, after nearly two weeks in Scotland, he wasn't about to admit that.

They turned west again, and followed a path Jane called the Radical Road, which ran at the foot of a low crag. She said, 'This is the north end of Salisbury Crag.'

He stepped forward and ran his fingers over the exposed rock. 'It's a sill,' he said. 'A sheet of basalt.'

'I know.'

'Geologists like basalts,' he murmured. 'They're what you get when planets melt. And they tell you a lot about hidden processes ...' He ran his hands over the other layers. 'Looks like baked shale above it. Maybe cementstone. And below, this is sandstone —'

'I know that too. This is what's left of the Old Red Sandstone Continent.'

'You're a smart cookie.'

They walked on, along the base of the crag.

At length she said, 'I don't know if I like being called a "cookie".'

'You're very competitive, aren't you?'

'And you're not too good with people.'

He made to deny it, or to come back with a snappy answer. But he shrugged. 'Maybe not. You know, when I was doing my doctoral research I spent eighteen months in Norway, clambering around the fjords there. A lot of that time I spent alone. Working alone in tough terrain like that is something most geologists would frown on, but you do it anyway, when you are short on time or you're too poor to pay for a field assistant. As I was.'

'So I climbed over the ice rivers, trekked past sheer rock walls, trying to make the most out of the money it had cost me to go there. Oh, I knew my limits; I saved the really tough country for those times when I was accompanied. But I wasn't afraid of being out on a limb. Relying on myself.'

'And,' she said drily, 'your point?'

'Well, when I look back on it that was one of the happiest times of my life. Because it was the simplest. People just —'

'Make things complicated?'

'Something like that.'

'You never answered Dad's question.'

'Divorced,' he said. 'Just.'

'Jack's father left when he was still small. He doesn't remember him.'

'You don't need to tell me.'

'I want to tell you. Jack was a glue baby, if I'm honest. You know what that means?'

'I guess.'

'So, good riddance.'

'Right ...'

He liked the way the deepening light caught the planes of her face. It seemed to emphasize the strength and intelligence there.

He sneezed violently.

They walked on for a time. The path ascended and descended, a gentle switchback, as the lava sill waxed and waned in thickness.

At the end of the sill, they clambered up a steep, eroded path towards the summit of Arthur's Seat.

At the summit, they sat on broad, worn-smooth patches of ancient agglomerate. Henry found the backs of his legs were aching pleasantly; he hadn't been getting enough exercise, he realized.

They looked to north and west, over the city. A blue mist, sharply defined, lay across the land. The spires and towers of the city poked out of the mist. A waning Moon, thin and attenuated, hung in the sky.

‘The old folk call the mist the *haars*,’ Jane said.

‘It’s beautiful.’

‘On a clear day you can see a long way. All the way across the Midland Valley graben from the Highlands, fifty miles or so to the north, and down to the Southern Uplands, ten miles south-east of here, beyond the coal field –’

‘I’m impressed.’

‘By the view?’

‘By the fact that you know terms like *graben*.’

‘You’re such a patronizing arsehole.’ But this time her tone was so mild it almost sounded affectionate.

‘Thank you,’ he said. ‘So what about you? How did you get into, uh, rocks?’

‘And all the other cookie-girl New Age stuff, you mean?’

‘I didn’t say that.’

She pulled at a tuft of grass. ‘Actually, it was the Moon.’

‘The Moon?’

‘I read a science fiction story which shocked me. I was only ten or so – about Jack’s age, I guess.’

‘What story?’

‘I don’t remember the title. I think it was a Heinlein. The point was, he suggested the Moon is the way it is because of a nuclear war up there. It blasted off the atmosphere, and boiled the oceans, and killed everybody.’

He nodded. ‘And Tycho was just the biggest arms dump.’

‘You know it. You don’t need to tell me it makes no sense.’

‘I wasn’t going to.’

‘It scared me to death. As I got older I started to read about all the perils we faced – still do face. Before I left school I was organizing recycling drives. I read politics and economics at university. I got into real politics later, mainly with the Greens. Not that I ever got elected anywhere. But that doesn’t pay the bills –’

‘Hence the rock shop.’

‘Yeah.’

‘So,’ he said. ‘You’re what we’d call a survivalist? You think that when it all falls apart we should pack up and head for the hills?’

‘No.’ Now she did sound offended. ‘Of course not. We’re human beings. We got where we are by cooperating, by helping each other. It’s just that the future is so dangerous.’

‘Yep.’

‘We’re going to have to be smart to survive, on any timescale you care to think about. My dad says he thinks I went a little crazy, back when I was a kid. But I think I went a little sane. It was like waking up. It seems to me that everyone else is a little crazy, not me.’ She was looking out over the city, and the last of the sunlight picked out her profile, her strong nose and chin.

He said, ‘Maybe you’re too sane. Nobody should be burdened with too much future.’

‘I’m not so tough. I’m a twentieth-century baby like everybody else. Spoiled rotten. As soon as anything serious happened, I’d run round in circles.’

‘I wouldn’t be so sure.’

The light was diminishing. The Moon grew brighter, as if to compensate, and she looked up at it.

‘You know,’ Henry said, ‘the project I was working on for NASA was about going back to the Moon. Looking for water ice there. I think it’s possible there is so much ice you could actually terraform the Moon.’

‘Make it like the Earth.’

‘Yes. Somewhere else for people to live. But my project got canned, and we may never know about the ice. Nobody’s going to the Moon any time soon. Least of all me.’

‘Would you go if you had the chance?’

He grinned. ‘In those ropy World War Two rockets they fly? No, sir.’

‘So you’re a childless man who wants to build a new world.’

‘Oh. Sublimation, you think.’

‘Could be.’

‘And you’re a parlour psychoanalyst. Lucky me.’

She said, ‘You know, after I read that Heinlein story, I coloured in maps of the Moon, figuring out where the oceans and cities must once have been.’

He nodded. ‘How about that. So did I. We have something in common after all.’

‘I was just a kid ...’

He stared up at the Moon. ‘It would be a beautiful thing. A terraformed Moon. It would be much brighter. A twin of the Earth. And if you were on the Moon – well, with that low gravity, it would be like something out of H.G. Wells. *The First Men In The Moon*.’

‘Umm.’ She stood up, and brushed down her dress. ‘And people call me crazy.’

‘I never did.’

‘But you thought it. I know why. I run a shop where people come and pick up the rocks, trying to feel their vibrations –’

‘Now *they’re* the crazy ones.’

‘Are they?’ she said mildly. ‘But there’s a rock in my digital watch; its vibrations keep the time. And they vibrate rocks to send laser beams, all the way to the Moon. We live in a strange world. Come on. We’d better go down before it’s too dark. Although you’ll like the Northern Lights displays we’ve been getting since Venus ...’

He unfolded his legs and stood.

She led him down a different track, a path that would lead through a glacial cwm and then to a ruined chapel.

‘So,’ he said. ‘What about dinner?’

She frowned, but she didn’t immediately say no. ‘We just ate dinner.’

‘Hell, you know what I mean. What about the weekend? I – *woah*.’ He stopped in his tracks.

She slowed beside him. ‘What’s wrong?’

‘What is *that*?’ He pointed ahead.

It was a patch, on the exposed shoulder of the summit agglomerate, roughly circular. It had been hidden from where they had sat. It was, Henry estimated, two yards across. Its surface was metallic silver, flat as steel. At first it looked like some liquid – there was even a fuzzy reflection of the Moon – but he could see it was too sluggish, even for the scummiest pond.

He approached its edge.

It was a pool of some kind of fine silvery dust, or maybe rock flour. He crouched down to see. The contact with the surrounding basalt was quite clean. The rock flour seemed to be stirring slightly, almost bubbling, sluggish currents moving through its substance.

He found a loose pebble. He dropped it into the edge of the puddle. It vanished without so much as a splash.

Jane was standing over him, leaning with her hands propped on her thighs. ‘What do you think it is?’

He scratched his head. ‘I’ve never seen anything like it. Maybe it’s liquefaction. It could be some kind of magmatic event.’

‘Magmatic?’ She straightened up. ‘Come on. Arthur’s Seat has been dormant for three hundred million years.’

‘I know.’

‘It’s probably some kind of toxic waste,’ she said.

‘Maybe.’

He got up and walked off around the rim of the puddle, counting his footsteps.

Jane called, 'What are you doing?'

'Measuring.'

'Why?'

'It's an annoying thing geologists do. Can you smell anything?'

'Apart from bullshit, you mean.'

'Work with me here.'

She took a deep breath. 'Nothing but the grass and the *haars*.'

'Nor can I.'

'Is that good?'

'I don't know.'

'Is it bad?'

'When was the last time you were up here?'

She shrugged. 'A couple of weeks.'

'And it wasn't here then?'

'No.'

He returned to her. 'Listen, do you have a bottle? Maybe make-up. Perfume or *somesuch*.'

'I don't wear perfume.'

'Anything, then.'

As it happened, she did have something. It was a sample of an aromatherapy oil she'd been given by a salesman at the shop. She'd tucked it in a pocket and forgotten about it.

He took the bottle, unstopped it, and tipped out the oil.

'Hey.'

'I'll pay you.'

He shook the bottle dry, and then, carefully, he scraped the bottle along the top of the rock flour puddle.

When he was done, he stoppered the bottle and tucked it in a pocket of his jeans.

'What is that stuff?'

'I don't know,' he said. 'Maybe I'll be able to find out.'

She looked around. 'It really is getting dark now.'

'Yes.'

But he hesitated.

He walked to an outcrop of basalt near the pool, picked up a loose lump of rock, and hit the outcrop. He frowned at the result.

She said, 'What's wrong?'

'Did you hear that?'

'One rock hitting another? Flintstone chic –'

'The pitch was low. Basement rock will ring with a high pitch. This boulder is loose.' So something is breaking up the basement here.

Not good, he thought. Not good at all.

He walked carefully around the puddle. 'I wouldn't tread in that thing if I were you.'

'Why not?'

'You were saying about dinner ...'

'No. *You* were saying about dinner.'

They worked their way down the hill, arguing. Henry stumbled occasionally in the deepening dark; each time he patted his jeans pocket to make sure his sample was safe.

Behind them, the puddle glowed softly in the wan Moonlight. Where it stirred, the rock flour rustled.

## 8

Towards the end of Geena's eight-hour shift as capcom for Station, a problem came up with a seat liner for one of the Soyuz escape craft.

Because the seats in Soyuz were moulded to fit an individual astronaut or cosmonaut, liners had to be stored for every crew member on Station at any moment. But one of the Russian crew who had just been carried to Station, on board Space Shuttle *Endeavour*, was complaining that when she tried to install her seat liner into the Soyuz it didn't fit her. So the ground controllers, in Moscow and Houston, had gotten into a wrangle about what the cosmonaut's home vehicle was, and Geena found herself on the voice loops to Station trying to explain – in English and Russian – the home vehicle rules.

She read, "The home vehicle for Shuttle-Station crew members is defined as follows. The home vehicle for Americans launched on the Shuttle is the Shuttle. The home vehicle for Americans on Station becomes the Shuttle immediately after the hatches are opened between Station and Shuttle. The home vehicle for cosmonauts launched on the Shuttle becomes the Soyuz, and becomes the Shuttle for cosmonauts on Station after – one – the seat liners are installed for the Station crew in the Soyuz, and – two – the Station crew are briefed on emergency procedures ..."

Traditionally, the Americans tried to use Russian, while the Russians replied in English. It was slow and painfully clumsy, but it did seem as if less mistakes got made that way.

The Russian Interface Officer, a heavy-set woman from New York, was at her side, checking the agreed English-Russian translations of technical terms and acronyms.

The Mission Control Center here at JSC hummed around her, rows of sleek black touch-screen workstations like *Star Trek* props, littered with coffee cups and yellow stickies and laptops and binders of mission rules. Beside her desk there was a huge recycling bin for soda cans. At the back of the room was a row of pot plants, their tubs littered with more soda cans. At the front of the room, the big screens carried computer-graphic images of the Station's position and orientation in orbit, a view of the Earth from an external camera, and a shot of a science lab where a European astronaut was freezing saliva scrapings taken from the crew.

It was a familiar working place for Geena, so homely that coming in here was like taking an adrenaline antidote.

Bored to tears, she tried to focus on seat liners.

She'd spent the morning attending a press conference on the plans the boys from JPL were putting up for a fast probe to Venus. It had been exciting, energetic; in fact NASA as a whole had been energized by the Venus event, Geena thought. Whatever the ominous implications, the amount of attention space issues had received since then had been gratifying, and NASA's speed and flexibility of response invigorating.

But even so, when you got to the coal face of manned spaceflight, it was still a crushing bureaucracy to work in.

The seat liner controversy went on and on.

The hardest thing about managing the Station project was not the technology or the work on orbit. Geena knew from experience that once on orbit, isolated in that collection of tin cans, people tended to drop their personal differences and work together. Integrating two forty-year-old management hierarchies on the ground had proven *much* more difficult.

Even the basic philosophy of operation of the two control centres differed. For instance, previous Russian space stations – Mir and the Salyuts – had been out of contact with their controllers for most of each day, because of a lack of ground stations around the globe. So the Russians had developed a shift system based on that fact, which differed from the American system. And they'd had

to allow their cosmonauts more latitude in day-to-day operations and decision-making than American astronauts, checklisted to death, were generally permitted.

American and Russian mission controllers had worked together for some years now, on the Station assembly project and before that on the Shuttle-Mir docking missions, and had thrashed out a set of common procedures. NASA had given all its astronauts and controllers accelerated Russian language training, and had provided joint training and simulations, and so on.

But it was never going to be *easy*.

Day to day, they ticked along. But every time a real problem blew up, like this one, it seemed to go to the top of both hierarchies before resolution.

Gradually, the liner problem was eroded to bureaucratic smoothness. And, towards the end of the shift, she was able to snatch a little personal time on the loop with Arkady.

Of course, the whole of the MCC would listen in, as would TsUP, the Russian mission control at Korolyov; in fact a smart IBM computer somewhere would transcribe every word they spoke. But there was still room for a little intimacy. This was one area where the Americans had found they had had a lot to learn from the Russians; those guys seemed to have a better instinct for the internal needs of the people they thrust up there into orbit.

So, thanks to Russian mission rules, Geena and Arkady were allowed their air time.

She read him a poem Arkady's mother said he had always liked, called *Poltav Battle*. And then they sang together, her own toneless grunts along with Arkady's voice – more musical, but reduced to a scratch by the loop – an old Russian song called *On the Porch Together*. She got the odd stare from her fellow controllers, but she couldn't care less about that.

When she was done, she had a warm feeling which persisted even after her shift broke up.

She left the MCC, and made her way out of Building 30. She'd been intending to go straight to her car and home.

But she hesitated.

It was late afternoon. Spring: the least offensive period in Houston's calendar. There was blossom on the trees, and there were, she saw, birds nesting in the big air-conditioning grilles on the side of the faceless concrete block that was Building 30.

She walked to the central quadrangle of the campus, concrete paths criss-crossing the bristly grass between the buildings. No doubt, she thought, there would now be trails of ducklings quacking their way across the campus, if the ducks hadn't been chased out of JSC twenty years ago for the noise and mess they made. *We ain't here for ducks*.

She remembered her promise to figure out the context for Henry's precious Moon rock. She hesitated. Maybe the spring air was making her mellow.

She walked over to Building 2, Public Affairs, to find out how she could get hold of Jays Malone. It turned out he was coming in the next day, for a lecture and a tour of the lunar colony studies going on here at JSC. She talked her way into an invitation to join the party.

The next day, Geena made her way to the back of a lecture room in the PAO building, while Jays Malone fielded questions about his work from the scattered handful of journalists.

Jays Malone turned out to be a big man, still muscular, slim and supple for his age, which was – Geena knew from the biographies – about 70. He was crisply tanned, right to the crown of his head, which was totally free of hair, polished to a billiard-ball shine. He looked a little dwarfed by the giant show cards his fiction publisher had sent over – *Rocky Worlds – A Vision of the Future by a Man Who's Been There ...*

Geena had never met Jays before. He had retired before she had even joined NASA. She'd seen him on Apollo retrospectives and the like, but he was a few generations too remote from her astronaut class to have made any difference to her career here.



Jays stood up to speak. He propped his leg up on a chair, leaned on his knee, held a mike with one hand, and when he spoke, his free hand fluttered around his head like a bird, as if out of conscious control.

*So, Colonel Malone, why 'Jays'?*

'It was my sister. When she was a kid she couldn't say "James" right. It came out "Jays". It stuck as a nickname.'

*Is it true you changed your name by deed poll to Jays?*

'No. And it's not true I trademarked it, either ...'

Laughter. The journos were friendly enough, Geena realized, rows of faces turned to Jays like miniature moons.

*Why the title?*

'Something that occurred to me on the Moon,' he said. 'Maybe Earth is unique. But the Moon isn't, even in our Solar System. The Galaxy has got to be full of small, rocky, airless worlds like the Moon, Mercury. Right? I was only a quarter million miles from Earth, but if I looked away from Tom and the LM, away from the Earth, if I shielded my eyes so I could see some stars, I could have been anywhere in the Galaxy – hell, anywhere in the universe ...'

The audience shifted, subtly, showing he had hit the wonder nerve. With the younger ones anyhow.

But Geena knew he was cheating a little. There could have been no time for such reflection during those busy three days on the Moon; such insights had come from polishing those memories in his head, over thirty years, like jewels, until he probably couldn't tell any more what was raw observation on the Moon, or the maundering of an old man.

*Your books are full of geology. But you weren't trained in geology for your Apollo flight ...*

'That's not quite true,' Jays said, and he expanded.

The Apollo guys had some training from geologists attached to the project – they'd be taken to Meteor Crater, Arizona, or some such place, and taught to *look* – they had to try to be geologists, at least by proxy, in a wilderness no true scientist had ever trodden before them. But in the end Jays had spent three days bouncing across the Moon, wisecracking and whistling and cussing; for the point of the journey was not the science of the Moon, of course, nor even the political stuff that pushed them so far, but simply to get through the flight with a completed checklist and without a screw-up, so you were in line for another.

But for Jays, there never *had* been another. After returning home he was caught up in the PR hoopla, stuff he'd evidently hated, stuff that led him to drink a lot more than he should. And by the time he'd come out of *that* he found himself without a wife and out of NASA, and too old to go back to the Air Force.

Jays talked about all this now. 'It was a time,' he said with a smile, 'I still think of as my Dark Age.'

The audience was silent.

'But I kept in touch with the studies of the Moon rocks we brought back. I showed up at lunar and planetary science conferences. And that got me interested in geology. I took a couple of night classes, even made a few field trips, over the years. For a while it was just a way to fill up time between Amex commercials and daytime talk shows. But I soon came to know a lot more about the Earth than I ever did about the Moon.'

And, he said, gradually, the geology stuff had hooked his imagination.

Death Valley, for instance: one of the most famous geological showpieces in America. But if you managed to look beyond the tourist stuff about bauxite miners and mule trains, what you had there was a freshwater lake, teeming with wildlife and flora, that had gotten cut off from the sea. Over twenty thousand years the lake had dwindled and become more and more saline; the trees and

bushes died off and the topsoil washed away, exposing the bedrock, and the lake's inhabitants were forced to adapt to the salt or die ...

His first piece of fiction, a short story, was slight, a tale of a human tribe struggling to survive on the edge of such a lake.

Nods, from the sf enthusiasts in the audience. *The Drying*. It had won a prize.

The story sold for a couple hundred bucks to one of the science fiction magazines, Jays said he suspected for curiosity over his name alone. A novel, painfully tapped into a primitive word processor, followed soon after. He hadn't read sf since he was a kid, but now he rediscovered that sense of time and space as a huge, pitiless landscape that had impelled him towards space in the first place.

*Are you arguing for a return to space, in your books?*

'I guess so. I think we need to be out there. You don't need to know much geology to see that ... On Earth, in a few thousand years the ice will be back, scraping the whole damn place down to the bedrock again, and I don't know how we're proposing to cope with that. And then there are other hazards, further out ...'

*The next big rock. The dinosaur killer.*

'It's on its way, maybe wandering in from the Belt right now, with all our names written on it ... Or maybe there is some other hazard, waiting out there to bite us. But I'm not propagandizing here. This is just fiction, right? I want your beer money, not your vote.'

Laughter.

Of course, propagandizing was *exactly* what Jays was doing.

Jays had said on a multitude of talk shows how he was dismayed by the Shuttle program – a clumsy, compromised, primitive design, just a V-2 with air conditioning, it seemed to him – and by the lack of any serious consideration being given to any more advanced follow-up.

For the fact was there *were* smarter ways to get into space, to reach the Moon and beyond. For instance, orbits of spacecraft passing between the Earth and the Moon were actually unstable, because of the tweakings of the lumpy gravity fields of Earth, Moon and sun. If you gave your spacecraft the right kind of push, in the right direction, at the right time, you could use that instability to make your spacecraft drift to the Moon. It would take longer to get there than the three days it had taken *him*, but that wasn't necessarily a problem, for it would be at a fraction of the cost in fuel and mass in low Earth orbit.

'Then,' he said, 'once you are on the Moon, there's oxygen, and water, and materials for rocket fuel, and materials to make glass and concrete ... Once you are on the Moon, with all those resources out of Earth's deep, heavy gravity well, hell, you can go anywhere!'

It was a vision he shared with a handful of others, inside and outside NASA: how, with a little imagination, the Solar System could, after all, be opened up for colonization, with the Moon as the key.

Unfortunately, nobody with any power, financial or political, wanted to listen. Even to somebody who had been there.

So he began to work in more subtle ways. He joined the board of the National Space Society, for instance. He published his conceptual studies wherever he could, and plugged them on chat shows. He started to work his ideas into his fictions, building up a body of work that, piece by piece, it seemed to Geena, amounted to a kind of schematic of the future, a ladder to history.

Robert Heinlein had done something similar, back in the '40s and '50s, and so nurtured the minds of the youngsters who would go on to run NASA, and touch the Moon. Now – in less optimistic times, with a deeper understanding of how God-awful difficult the whole enterprise would be – Jays Malone was trying the same trick.

'I tell you,' he said, 'I've given up on you guys. Your generation. All this New Age crap. But there are always the kids. Always the kids.'

Jays talked on, taking the questions – dumb, perceptive, intrusive, whatever – with a clumsy, good-humoured grace.

She waited until the autograph queue had dissipated, and approached Jays.

Jays regarded her gravely. 'I know you. Geena Bourne. You just came down from Station.'

'Yes.' She felt vaguely surprised that he should follow the current program so closely. 'I'm glad to meet you.'

'You are?'

'I'd like your help. I need to talk to you about 86047.'

A frown crossed his face.

Geena told Jays what she wanted. She hoped that if they went through the moment at which he collected rock 86047 one more time – with the help of the mission transcript and such documentation as existed – they would be able to reconstruct the rock's context sufficiently to help Henry.

Jays was resistant. 'I've been over those damn three days a hundred, a thousand times. What more is there to say?'

'Henry thinks there's plenty you could tell him.'

'Oh, he does. It was my piece of bedrock, you know.'

'86047.'

'Yeah. I guess I risked my life to collect it. And they let it sit in the vault for a quarter-century.'

'Not any more.' She outlined Henry's project. 'That's why the context is so important –'

Jays glared. 'How the hell was I supposed to document it?'

'Well, that's the point, Jays –'

'I had to hang upside down in that damn rille to capture it in the first place. Those geology back-room guys weren't *there*. They couldn't see how hard it was to follow their precious procedures, if you were *there*. I told them that.'

And so on. A one-way conversation.

'Anyhow,' he said to Geena, 'there's no good reason to ignore a rock like that for so long. I mean the attention they all gave that Genesis rock from Apollo 15 –'

Ah, Geena thought. That was it. Rivalry with the other crews, the trophy fish *they* brought home. Even after all this time.

'But now,' she persisted, 'late in the day or not, Henry is going to study it. But he needs your help. I need your help.'

He regarded her, his eyes pale blue.

Jays let her drive him out to his home.

She drove along NASA Road One east through the Clear Lake area – marinas, apartment complexes, parks. When the road reached the coast and turned up to go north towards the Port of Houston, they came to Seabrook. This was an old run-down village, with wooden houses mounted on five-foot stilts.

Jays's house must once have been handsome, but now it was faded by sun and busted down by the weather and neglect. Some of the houses in the area were being restored now, but not Jays's. It looked, in fact, like a prop from *Gone With The Wind*.

It was kind of a nice area, Geena supposed, to retire. The houses would catch the light off of the ocean in the mornings. But it reeked of age.

The house was full of age too. A ticking clock. A dog, a quiet spaniel. A litter of aviation trophies, slowly gathering dust. A bookshelf with a row of his science fiction books, skinny hardback volumes. In the middle of it all, on a walnut coffee table, there was a double picture frame: Jays as a kid, gappy grin and slicked-back hair; and an image of Jays the man in his brief prime, bouncing over the tan brown lunar surface, suit glowing in the sun, on his way to one checklisted task or another.

It was the home of an old man who had been alone too long.

Jays made her a cup of coffee. Full of caffeine and cream, it was all but undrinkable, but she drank it anyway. For himself, he cracked a beer.

‘So,’ he said. ‘You’re trying to help out your ex-husband. Kind of complicated.’ He smiled like a grandfather. ‘Not sure I ought to get involved.’

‘Well, he blames me for canning his project.’

‘The *Shoemaker*. Is he right?’

‘I don’t think so. I spoke out against it. But you know how this stuff works.’

He nodded and took a pull of his beer. ‘You didn’t do him any damage. But you weren’t too smart about your marriage.’

‘I was speaking up for Man-in-Space.’

‘Sure,’ he said drily. ‘Chewing the balls off of your husband had nothing to do with it.’

‘It wasn’t like that.’

‘And now you want to make it up with him.’

‘No. It’s done. I just don’t want it to finish in bitterness. We’ve got our whole lives ahead.’

He nodded. ‘Smart. A lot of sleepless nights to get through. Sometimes I wish ... Well,’ he said, ‘you think we should go back to the Moon?’

‘No. I heard what you said. But we ought to get on with Station. The space lobby is always divided. We should get behind the project we have.’

‘Bull.’ He crumpled the can, seemed to be thinking about another, then decided against it. ‘We’ve been fooling about in Earth orbit for too long. We didn’t need Station to go to the Moon. If we want to go to the Moon then we should go to the Moon. Learn to live off the land. You can’t do that in LEO.’ He eyed her. ‘Not that it would be easy. Some of the space buff types who come to see me seem to think it would be like the pioneer days, setting off into the western desert. It won’t be. We got to the Moon for three days apiece, two guys for just three days, and we had to bend the national economy backwards to do that. Up there, you have to haul along every drop of fuel you need to land, and the dust eats away at any equipment you have, and the volatiles in your seals boil away in the vacuum, and you have to bake the air you breathe out of the rock. Not impossible, but *not* easy.

‘And all we got to work with,’ he nodded a head to the west, ‘is NASA. A Cold War museum. You ever think about that? What we’d actually do if some kind of *When Worlds Collide* situation came along, the dinosaur killer maybe, and we had to set up a colony off-world, fast? Hell, we wouldn’t have a hope.’ He drained his beer. ‘People who say the Moon is easy are talking out of their asses. You can colonize a desert with Stone Age technology. On the Moon, you need to be *smart* ...’

Sure, Geena thought. Sure, let’s all dream about the Moon. That’s fine, if you don’t have to live and work in the space program as it exists, today, in the real world. Which means Station, like it or not.

‘Can we talk about your rock?’

He was avoiding her eyes. He was reluctant – but also unwilling to show it.

There was something he wasn’t telling her, she thought. Something he knew about that rock he wanted to keep to himself. She had no idea what that could be.

He sighed. ‘Okay, lady. I don’t know what good it will do, but you got a deal. What do you want me to do?’

She got out her tape recorder, and replayed the voice transcripts of those remote moments when he’d found the rock that became known as 86047.

*... Okay, Joe. It’s a block about a foot across. I’d say it’s an olivine basalt. It’s almost rectangular and the top surface is covered in vesicles, large vesicles. It almost looks like a contact here between a thin layer of vesicles and a rock unit that’s a little lighter in colour with fewer vesicles. And I think I can see laths of plagioclase in it, randomly oriented, two or three millimetres across ...*

So, in his living room, with a view of an ocean already tinted dark blue by the light of the setting sun, the old man listened to the words he’d once spoken on the Moon, and, as he descended

in his mind once more into that lunar rille, he dredged up fragments of description and memory, which Geena noted down.

When she was done, Geena left Jays to his solitary peace.

On impulse, she drove on east and north through the darkening, faded grandeur of Seabrook, and it seemed as if maybe all the relics of the Space Age might one day end up here, washed along the coast by some intangible tide of time.

But when she went just a little further north she entered industrial areas. The Dixie Chemical Company, the Graver Tank & Mfg Co. Inc., and so on. Further on still, on the Bay Area Boulevard, there were a lot of space-related industrial concerns: Lockheed Martin, Honeywell Space Systems, IBM, Hughes Aircraft, on roads called Moon Rock Drive and Saturn Road. Symbols that space wasn't yet quite dead, a sepia-tinted memory, an impossible dream of the generation of Heinlein and von Braun.

It was like coming back to the present, she thought, from a dismal descent into the dead past. She opened her window to let fresh air into the car, and turned the radio to a rock channel.

## 9

Constable Morag Decker swung her patrol car into Viewcraig Gardens and immediately ran into a jam.

She counted three sets of roadworks, a scene of wooden separators and flashing yellow lamps and hard hats and jack-hammers. There were vans belonging to the gas company and British Telecom, and another from a private contractor that looked as if it was responsible for cable repairs, bumped up onto the kerb on both sides of the road. The traffic wasn't too heavy, in the middle of this Monday morning, with the sun rising high above Arthur's Seat. But the tailbacks already stretched hundreds of yards to either side.

Maybe she should call the station.

It was unusual for more than one crew to be vandalizing the road surface at any one time. For now, the traffic was moving okay, but she could see the signs of frustration in the way the drivers edged closer together and glared at the crews as they passed. One accident, even something trivial, and the road would be blocked.

Today was April 1st. She wondered if this congestion was the result of some misbegotten joke. She frowned as she thought it over.

At twenty-five, Morag had had her uniform for just a year. At her last appraisal her sergeant's most cutting comment had been about the way she refused to take responsibility on the ground. She was always too willing to pass the buck up the line, so he said.

She didn't entirely agree. She thought reporting up the line was generally pretty responsible, in fact; information to support good decision-making had to be the key to any reasoned response. So she'd been trained, and so she believed.

But her sergeant was of an older school, toughened in the English inner city riots of the early 1980s, when the police were essentially at war with a hostile public. *I remember my community policing training. A video shot through the back of a riot shield in Toxteth. My God, the looks on the faces of those yobs ...*

Her own presence, gliding through here in the marked police car, was having a visibly calming effect. Maybe a copper on the spot wouldn't be a bad idea during the rush hour, later in the day.

She deferred the decision.

In the meantime she had a more immediate problem: nowhere to park.

She was in luck. Ted Dundas was out in front of his house, prodding vigorously at a garden verge. When she pulled alongside she opened her window and leaned out.

Ted straightened up, leaned on his hoe and nodded. 'Morag. Come to see me?'

'No such luck. But I need to get this beastie off the road. Can I –'

'Use the drive?' He dropped his hoe and, with an alacrity that belied his years and beer gut, he hopped over a low wall and opened the wrought-iron gate.

That was Ted for you: helpful without pressure or hassle. He'd been one of the most helpful elements in the station when she'd joined last year; she genuinely regretted his retirement from the force.

She briskly reversed the car into the drive. She climbed out, carrying her peaked cap.

On impulse, she looked east, towards Arthur's Seat. The air was – odd. She thought she could smell ozone, like at the coast, or maybe before a storm. But the clouds were high and thin. And the light above the Seat seemed strange. Yellowish.

Morag reached out to lock her car. As her fingers approached the handle, a blue spark leapt from her fingertips to the metal; there was a tiny snap, and her fingertips burned sharply.

She snatched her hand back, involuntarily. 'Shit.'

'Language, Constable,' Ted said. 'I've been doing that all morning.'

‘Storm weather, you think?’

‘Maybe. What are you up to here?’

‘A call from a Mrs Clark. Lost her cat. Insisted on a personal call.’

Ted nodded. ‘Two doors down. Ruth’s a widow. Be kind to her, Morag.’

‘I will.’ He calls her Ruth. Interesting. Gossip for the station canteen later.

She locked the car without any further static shocks, nodded to Ted, and walked down the road.

Ruth Clark, Ted Dundas’s neighbour, was a slim, intense woman on the upper margin of middle age; evidently the cat meant a great deal to her.

Morag took the cat’s description: a tabby, five years old, female. Unusually intelligent and sensitive. (Right.)

She looked around the boundary of Mrs Clark’s fairly shabby suburban garden. There was no sign of cat droppings – but then, said Mrs Clark, Tammie was too smart to do her business in her own garden and she *always* used the neighbours’, oh, yes.

On the other hand, there was no sign that anything amiss had happened to Tammie. No rat poison put down by a pissed-off neighbour, for instance.

Missing cats weren’t a police priority. There wasn’t anything Morag could do but assure Mrs Clark that they would circulate the details of the cat, and suggest that she do her own searching – circulate notices to the neighbours, for instance – and then she endured a little routine vitriol at the general incompetence and apathy of the police.

‘Even my phone’s been off since I got up. I had to walk down the road to the public phone box and you wouldn’t believe the filth ...’

Morag got out as quickly as she could, reported into the station, and walked back up the road to Ted Dundas’s.

She sat in his kitchen – warm, smelling so thickly of bacon she could feel her arteries furring up just sitting here – and let him make her a mug of strong tea. He boiled up a pan on a battered camping stove, propped up on his gas hob.

‘The gas is off,’ Ted explained. ‘You saw the repair crew in the road. Bunch of bloody cowboys,’ he said amiably. ‘I heard old Dougie at number fifteen complaining about it, and he said he’d heard someone else had called them in to look at a leak. Dougie heard that because they’d come to borrow his mobile phone; their phone was out.’

Mrs Clark’s phone had been cut too. ‘Ted, what about your phone line?’

‘Snafu. But I have a mobile. But you can hang the bloody phone; what bothers me is the cable TV. I was watching the baseball from Japan. Got to the fourth innings before it cut out.’

‘Um.’ Cable and phone lines and gas lines, all out. Morag turned over the possibilities. Was it possible one of those cack-handed crews, doing some innocent repairs, had cut through the other service lines? It wouldn’t be the first time. Or what about deliberate vandalism?

‘You own a cat, don’t you, Ted?’

‘The cat owns me, more like.’

‘I just can’t see what people like about the bloody creatures.’

‘Aye, well, cats are unpleasant and unnecessarily cruel predators. And it’s soggy and sentimental to think anything else.’

‘But you keep one anyhow.’

‘I told you. I think Willis keeps me.’ He poured her more tea. ‘We have a partnership of equals, me and that animal.’

‘Where is he now?’

He eyed her. ‘Not here.’

The house shuddered gently.

Concentric ripples on the meniscus of her tea, like a tube train passing far beneath the foundations. Except there was no metro in Edinburgh. Or maybe like a heavy lorry rolling by, shaking the ground.

But Viewcraig Street was a cul-de-sac.

She glanced up at Ted. He was watching her carefully.

'Funny weather,' he said.

'Yeah.'

'Listen, do you have a couple of minutes? There's something I'd like you to take a look at.'

They walked out to the back of Ted's house, towards Arthur's Seat. They headed up the slope towards St Anthony's Chapel. Soon they were off the path and climbing over a rising rocky slope; the grass slithered under Morag's polished shoes. Once they'd risen twenty yards or so above the level of the road, the Edinburgh wind started to cut into her.

'I'm not equipped for a hike,' she said.

'You'll be fine.' Ted's grizzled pillar of a head protruded from the neck of his thick all-weather rad-proof jacket. His legs worked steadily, hard and mechanical, and his breath was deep, calm and controlled.

It was quiet, she noticed absently. There was the moan of the wind through the grass, the distant wash of traffic noise from the city. But that was about all.

What was missing?

She stopped. 'Bird song,' she said.

'What?'

'I can't hear any bird song. Can you? That's why it's so quiet.'

He nodded, and walked steadily on.

A few dozen yards further, Ted halted. He pointed up the slope, towards the grey, brooding pile of the Chapel, where it sheltered under the crag, still a couple of hundred yards away. 'There,' he said. 'What do you make of *that*?'

'What?'

'Don't they teach you observation any more? Look, girl.'

She looked, and stepped forward a couple more paces.

Under scattered fragments of broken orange-brown igneous rock, under green scraps of grass and heather and moss, there was a silvery pool. It clung to the outline of the crag, as if the rock had been painted.

'Now,' said Ted, 'this used to be solid rock. I wouldn't step much further.'

'Why not?'

He bent and picked up a chunk of loose rock. With a reasonably lithe movement he threw it ahead of her, into the dust.

It sank out of sight, immediately, as if falling into a pond.

'Wow,' she said. 'How far does this go?'

'I don't know. There seem to be other pools, up around the summit, and then the odd outbreak like this one. Like something coming through the rock, somehow.'

'Has anybody been hurt up here?'

'Sunk in the dust, you mean? Nothing's been reported, so far as I know.'

She thought. 'No, it hasn't.' She'd have heard. 'So what's caused it?'

'Well, hell, I don't know. I'm no scientist. I'm just an observant copper, like you. What else do you notice?'

She looked around, trying to take in the scene as a whole. Her skirt flapped around her legs, irritating her.

'I think the profile has changed. Of the Seat.'



‘Very good. On the slope we’re standing on, which is no more than six or eight per cent, I’d say there has been a slip, overall, of ten or fifteen feet. And in the steeper slope at the back of the Dry Dam, for instance, it’s a lot more than that.’

‘You think so?’

‘You can hear it. Especially at night. Rock cracking. Little earthquakes, that shake the foundations of your house.’

She stepped forward, cautiously; she had no desire to imitate the fate of Ted’s pebble. When she’d got to where she judged the edge of the dust pool to be – still standing on firm, unbroken basalt, maybe three feet from the lip of the dust – she crouched down.

The dust was fine-grained, like hourglass sand. It seemed to be shifting, subtly, in patterns she couldn’t follow. It was more like watching boiling fluid than a solid.

She thought she could smell something. Perhaps it was sulphur, or chlorine.

Occasionally she thought she could see some kind of glow, coming from the dust where it was exposed. But it was sporadic and half-hidden. She’d once flown over a storm in a 747; looking out of the window, at lightning sparking purple beneath cotton-wool cloud layers, was something like this.

‘Come on,’ Ted said. ‘I need to show you something else.’ He headed down the slope, and started walking around the pool.

She straightened up carefully, and went to follow Ted.

She said, ‘You think this has something to do with the loss of the lines? The TV and gas and phone –’

‘I wouldn’t be surprised,’ he said mildly. ‘Can’t say how far underground it spreads, how far it has got.’

‘But if there are land slips going on, some kind of subsidence –’

‘You could get line breaks. Yes. There have been scientists up here, poking and prodding away. There’s an American chap my son works with ... But they’re just recording, measuring. I think someone should be *doing* something. Taking it a bit more seriously.’

They climbed around the crag. They were paralleling the edge of the funny dust, Morag saw. It made for a rough circle, she supposed, patches of it draped across the breast of the land. But the edge of the circle was rough and irregular; in some places necks of the dust and broken ground came snaking down the hillside, perhaps carried there by some slip or a fault in the basalt, and they had to descend to avoid it.

Now, Morag heard singing. *I Wish I Was A Spaceman / The Fastest Guy Alive* ... It sounded like a TV theme tune.

‘Good Christ,’ Ted said. ‘I haven’t heard that in thirty years.’

‘It sounds like kids’ TV.’

‘So it is, my dear. But long before your time.’

They entered the Dry Dam and came on a line of people. They were dressed in some kind of purple uniform, and they were sitting in a loose circular arc that embraced the hillside, and they were singing.

*I’d Fly Around The Universe* ...

They were mostly slim to the point of thinness. They didn’t seem cold, despite the paucity of their clothes, the keenness of the wind up here. They were singing with a happy-clappy gusto.

There was a boy standing at the centre of the loose arc, age eighteen or so, skinny as a rake. When he saw Ted and Morag approaching he got to his feet, a little stiffly, and approached.

‘Welcome,’ he said. ‘My name is Bran.’

‘Now then, Hamish,’ Ted said stiffly.

Morag glanced at Ted. ‘You know this gentleman?’

‘Used to.’

‘Would you mind telling me what you’re doing up here, sir?’

‘Watching the Moonseed, of course,’ Bran-Hamish said.

‘The Moonseed?’

‘All this started just after that Moon rock was brought to the university. And Venus, of course. Fantastic, isn’t it? Two thousand years of waiting –’

Morag walked forward. The members of the group, still singing, looked up at her. Before each of them there was a small cairn, of broken fragments of basalt. When she looked further up the slope, she saw broken ground, exposed silver dust, loose vegetation floating on the dust. Another pool. The smell of ozone was sharp.

‘Every morning we mark it with a cairn,’ Bran said. ‘And every morning it has come further down the slope.’

‘You’re a fruitcake,’ Ted said bluntly.

‘Maybe,’ Bran said amiably. ‘But at least we’re *here*. Where are the scientists, the TV crews, the coppers –’

Morag thought she could answer that. She imagined her own desk sergeant fending off nutcase reports from dog-walkers, about an oddity no one could classify.

Morag frowned, pointing up the slope. ‘Where are the other cairns? The ones from yesterday, and the day before.’

‘Gone,’ Bran said simply. ‘Consumed, every morning. Like your fry-up breakfasts, Ted.’

Morag straightened her cap. ‘Sir, I think you’d be advised to come away from here.’

Bran spread his hands. ‘Why? Are we breaking the law?’

‘No. And I can’t compel you to move.’

‘Well, then.’

She pointed to the dust. ‘But it’s obviously not safe.’

‘We’ve never been safer. Not since the Romans came have we been so – *close*.’

Ted pulled a face at Morag. ‘I told you. Fruitcake.’

Bran-Hamish just laughed, and resumed his seat with the others.

Morag and Ted walked away.

‘Well,’ Ted said. ‘Now you’ve seen it. What are you going to do?’

Morag hesitated.

She’d never faced anything like this before, in her brief police career.

She’d had some emergency training, at police college and since joining the station, with the council’s emergency planning people. It had all been rather low-key, underfunded and routine. Britain was a small, stable island. Nothing much in the way of disasters ever happened.

Morag had not been trained to handle the unexpected.

‘I can’t see this is any kind of criminal matter. And this isn’t yet an emergency.’

‘It isn’t? Are you sure? *What if it keeps growing?*’ He eyed the horizon. ‘You know, cats are smart animals,’ he said. ‘Sensitive. Sometimes they react before the rest of us when something is going wrong.’ He hesitated. ‘I’ve not told Ruth, but I haven’t seen Willis for a couple of days either.’

‘*Something going wrong?* Like what?’

There was a sound like subdued thunder.

Morag and Ted exchanged a glance. Then they began to hurry back the way they had come, around the shoulder of the crag. The cultists came with them, running over the basalt outcrops in their thin slippers.

They came around the brow of the hill. They stopped perhaps a hundred yards from St Anthony’s Chapel.

The old ruin was sinking.

The single large section of upright wall, two storeys high, was tipping sideways, visibly, a ruined Pisa. But even as it did so its base was sinking into the softened ground. Its upper structure, never designed for such treatment, was crumbling; great blocks of sandstone were breaking free, and went

clattering down the wall's sloping face, making the dull thunderous noise she had heard. One of the lower wall remnants, she saw, had already all but disappeared, its upper edge sinking below the closing dust as she watched.

It was like watching some immense stone ship, holed, sink beneath the stony waves of this plug of lava.

Around them, the cultists were jumping up and down, whooping and shouting.

Morag shook her head. 'What does it mean, Ted?'

'I've no idea,' Ted said grimly. 'Ask these loonie buggers. I think it's time you made a report, girlie.'

'Yeah.'

She lifted her lapel radio to her lips.

## 10

Jane showed up in the lab, a little before noon. Mike actually escorted her into the clean room area. The staff had got the clean room procedures beefed up a little by now, and so Jane was wearing the regulation white bunny suit and cloth trilby, blue plastic overshoes.

‘Hi.’

Henry, with his hands inside a glove box, did a double take. ‘Oh. It’s you.’ He fumbled the petrological slide he was handling, and tried to pull his hands out of the arm-length rubber gloves; he fumbled that too.

Her face didn’t crack a smile. ‘Sorry. I’m disturbing you.’

‘No, no. That’s okay. I just didn’t recognize you.’ He studied her. ‘You look –’

‘Different? Not so threatening in this male scientist disguise?’ She wandered around the lab, passing between the stainless steel NASA glove boxes, the low fluorescent lights catching the wisps of hair that protruded from her hat. ‘I got Mike to sign me in for an hour. I wanted to see your world. I promise I won’t touch anything.’

‘If you do, you’ll be zapped by NASA laser beams.’

‘So these are Moon rocks.’

‘Yeah. Come see this.’ He led her to the centre of the room, where the largest single isolation tank stood, on four fat steel legs. She followed him, and they stood side by side, peering into the tank.

Standing this close to Geena, he remembered, there had always been the faint smell of deodorants, shampoo, perfume. The chemicals industry of the late twentieth century. But with Jane there was only the autumn-ash scent of her hair. Like Moon dust, he thought absently.

They’d been seeing each other, on and off, for a month now. Dinners. Walks, drives. A lot of gentle sparring as they picked at each other’s old wounds. Goodnight kisses like he used to get from his aunt.

Maybe he could detect the stirring of some kind of attraction in her, on a subconscious level. The way volcano junkies could sometimes sense the stirring of magma pockets far underground, before the most sensitive of seismometers showed a trace.

After all, she was here.

Or maybe that was all self-deluding bull. He had been disastrously and persistently wrong about Geena. After a month he still wasn’t sure.

The box contained a big, battered case made of aluminum. It was open. Inside the box was a series of dirty Teflon bags, some of them slit open.

Jane said, ‘What’s this?’

‘An Apollo Sample Return Container, in NASA-ese. A rock box, to you and me. This is one of the boxes Jays Malone and his buddy filled up on the lunar surface, with Moon rocks they put in those numbered Teflon bags. And it was left unopened in twenty-five years.’

‘You’re kidding.’

‘More than half the Moon rocks have never been touched. We had to sterilize the box, with ultraviolet light and acid, dried it with nitrogen, punctured it to let out whatever trace of lunar atmosphere was in there –’

‘Why? You can’t think there is any danger of contamination.’

‘Of us, by the rocks? Hell, no. But they planned for it back in the ’60s. They even sterilized the films the astronauts brought back from the Moon’s surface. No, now we’re more concerned with protecting the Moon rocks from *us*.’

Jane leaned forward and inspected the Moon samples, where they nestled in the slit-open bags. ‘I’m not sure what I was expecting,’ she said. ‘Something – primordial. More glamorous. This looks like –’

‘What?’

‘Like jacket potatoes that got left too long on the barbecue.’

He laughed. ‘The Moon is a dark world, Jane; it only looks bright in the sky for lack of competition.’

She pointed to an empty bag. It was numbered ‘86047’. ‘What happened to that one?’

‘That’s the most important rock in this box. The focus of the study. It’s lunar bedrock. Possibly ...’

The work on the Moon rock was actually picking up quickly – although Henry hadn’t had much time for any real science yet, as so much of his time was being taken up with organizational stuff. He had to ensure the lab assigned the right facilities for the preliminary studies he wanted to run – emission spectrometry, X-ray crystallography, mass spectrometry, X-ray fluorescence and neutron activation. He wanted to push for a scanning tunnelling microscope study, but there was no STM here, and Dan McDiarmid made it clear exactly where the boundary of his budget lay, as if every STM in the world had been transported to the Moon itself.

It put Henry in his place, and he spent a lot of time fuming and fighting for turf.

But the work itself had soon gotten going well enough.

Mike Dundas was proving to be a good choice as his lab manager, confirming Henry’s hunch. Mike made sure procedures and operations ran smoothly, and didn’t get in the way of the researchers, including Marge Case, who were waiting to start their studies.

He told Jane, ‘I’m interested in finding fragments of the Moon’s primordial crust, the first that formed after the Moon turned into a molten ball, after it accreted. *Global melting*: if it happened to the Moon, it must have happened to Earth, and other large bodies like Venus and Mars. But we have to know how it all happened. And the Moon is a natural place to study the process; the evidence is all buried deep on Earth, by the continuing geology of the planet.’

‘And is that what your bedrock fragment is? A piece of primordial crust?’

‘Unfortunately, no. We haven’t found a large crust fragment in any of the Apollo samples. But in bedrock like this we can expect to find fragments in the breccias, recycled repeatedly from earlier ejecta blankets ... That is, smashed up and stuck back together again several times.’ He eyed her. ‘Come see what I’m doing.’

He led her to a bench, where he’d set up his petrological microscope. This was just a crude microscope, set up so you could look through a thin rock slice on a rotating stage, illuminated by a light source beneath. Jane squinted, trying to see.

‘Your brother is good at producing slides for this, over in the rock cutting lab,’ he said. ‘You take a thin section of rock – say, five millimetres. You polish it with carborundum, take some thin chips, stick them to glass with optical glue, and then polish them in a grinder until they’re no more than fifty microns thick. Thin enough to see through. The art is the finishing by hand that comes after that; you need better than five microns tolerance, and to get that you have to overcome faults in the jib you use, even in the glass slides themselves ...’

She looked dubious. ‘I’m surprised they let you bring that thing in *here*.’

He looked at the microscope, through her eyes. It was kind of battered, he admitted. He’d picked it up for twenty bucks as an honours student when his department had a clear-out, and it had been old even then. But the mechanism still ran sweet as a nut, and the Swiss optics were as bright and clear as the day they were ground, and the ’scope, worn smooth with use, had been all over the world with him.

Henry expected to be buried with his ’scope.

Still, Mike had banned him from bringing its wooden box in here, which was even more disreputable.

He stepped forward to check the alignment. The view through the eyepiece was a disc of multicolored light, irregular shapes of bright colour. He twisted the analyser disc to show up the colours.

‘Take a look,’ he said. ‘Try to keep both your eyes open. After a while, you won’t see anything through your other eye.’

She bent, and turned the analyser as he showed her.

‘What do you see?’

‘It’s like a view down a kaleidoscope.’ Jane straightened up. ‘Wow. I’m dizzy.’

‘That’s your other eye cutting in. Forget it. The point of the ‘scope is that you can see what minerals are present there, just by letting the thin slice filter polarized light.’

‘Just like that? At a glance?’

‘At a glance. Neat, isn’t it?’

‘What am I looking at? Your bedrock?’

‘No. That’s a reference sample. A lunar basalt from another suite, closer to the norm of the Apollo samples. Tell me what you see.’

She bent again. ‘Lots of small shapes, like a tiled floor. And, here and there, like pieces of stained glass window, rough discs and rectangles. Much larger shapes. Ships of glass, sailing among ice floes. As seen when on acid.’

He laughed. ‘What you’re looking at is a felted matrix of small elongate crystals of feldspar – that’s the grey stuff – pyroxene, yellow – and olivine, all the bright colours you can see, scarlet and yellow and pink and blue. And stuck in the matrix you have those bigger crystals, phenocrysts of pyroxene and olivine.’

‘Now.’ He took out the slide, replaced it with another. ‘This is 86047. The bedrock. See if you can tell the difference.’

She looked.

‘No olivine.’

‘To a first approximation, yes.’

She straightened up, frowning. ‘So what?’

He lifted his white hat and ran a hand through his hair. ‘So, that’s *wrong*. I can’t figure out what process has taken out the olivine here.’

‘Look – rock is made of silicon and oxygen, and other stuff. The basic structure formed by silicon and oxygen atoms is a tetrahedron. An olivine molecule is built around a single tetrahedron, with iron and magnesium atoms stuck on. So olivine is the most basic form, the mother of all silicates.’

‘Deep in the mantle, at high enough temperatures, olivine is all you find.’

‘But when a lump of mantle material rises and cools, more complex molecules can form. You put together the tetrahedra like building blocks. First you get pyroxene, which has single chains of tetrahedra, then amphibole, which has double chains, and then mica –’

‘I’ve seen mica. Flaky stuff, thin, papery sheets that you can chip off with a fingernail.’

‘Right. Mica is made up of sheets of the tetrahedra. But then, when the mica cools further, you have quartz. A three-dimensional lattice, a tough, hard crystal. So you are getting more and more complex silica structures, built of tetrahedra.’

‘So what happened here?’

‘I don’t know. It looks as if something has – accelerated the process, in this lump of Moon rock. Reworked the crystalline structure.’

‘Reworked? How?’

‘I’ve no idea. One tack we’re following is trying to replicate lunar mantle processes in the high-pressure labs.’

In these, he told her, you placed a small sample of your rock in a foot-high stainless-steel block called a bomb, and then pressurized it hydraulically, as far as twenty thousand atmospheres, which corresponded to pressures in the Earth's mantle.

Sometimes the bombs failed, and lived up to their names. So the labs were run remotely, and had steel plates built into their walls, and blast chimneys.

But the high-pressure tests weren't showing them anything they didn't know already.

'In the meantime, we're ordering up other studies. X-ray fluorescence work, and time on the ion microprobe they have here. That lets us study the composition of very small samples of the rock ...' He scratched his head under his hat. 'I'll tell you something else odd. The samples I've been taking from the liquefaction patch, on Arthur's Seat –'

'I'd like my bottle back sometime.'

'Yeah. I ran them through the 'scope, and a couple of other tests. They are deficient in olivine as well ...'

She frowned.

'I can't see any connection either. Spooky coincidence, huh.'

But she was hesitating. As if there *was* something, some connection, she wasn't telling him.

He said, 'You know, if this – whatever – is consuming olivine –'

'What?'

'The Earth contains a *lot* of olivine, in the mantle. No wonder that patch is growing. And it isn't going to stop eating either.'

'Eating?' She laughed, a little nervously. 'You make it sound alive.'

'I don't know what the hell I mean.'

'Do you think we should tell somebody about this?' she asked.

'Like who?'

She shrugged. 'The police.'

He blinked. That hadn't occurred to him, that aspect of the situation. The *threat*. Maybe Geena was right that he had a one-dimensional mind.

'You know, I don't like the inexplicable.'

'Oh, come on,' she said. 'Be honest with yourself. I know you people. You have a puzzle, and that makes you happy. Something you have to figure out.'

He straightened up. 'Buy me lunch and we'll discuss it.'

She smiled.

'Listen, you want to see 86047 before you go? The bedrock sample. It's in the case over there by the wall.'

She shrugged. 'You've seen one Moon rock, you've seen them all.'

They made their way to the door, and squeezed into the improvised airlock together.

Behind them, in the central glove box, sample 86047 sat in the lab's fluorescent light.

It had already been sliced in half and thin samples taken, by Houston technicians and Mike's careful hands. In the harsh illumination it would have been difficult to tell for sure, but perhaps a careful observer might have noticed something odd about its flat, new surfaces, exposed for the first time since the formation of the rock, billions of years before.

The surfaces were glowing, softly silver.

And, with a rustle rendered inaudible by the layers of glass encasing the rock, a rain of fragments was whispering down from the exposed face.

Jane drove Henry to a multistorey car park close to Waverley Station, and they walked along Princes Street.

You could still make out the deliberate design of the old streets here, Henry thought: a neat rectangular grid pattern, almost like a US city. But whatever character the street had once had was

pretty much obscured by the encrustation of plastic and glass of the modern department stores and fast food outlets. There was even a McDonald's and a Dunkin' Donuts.

'This is what we call the New Town,' Jane said.

'I know. 1760. You told me.'

'The Old Town is the medieval town that grew up around Castle Rock. Narrow, windy streets, coming down the glacial tail there ...'

'You've been building this city for a thousand years, on top of an extinct volcano. I think you people are seriously crazy.'

'Well, maybe. In the Old Town they burned witches; in the New Town they bred lawyers and scientists.'

'Split personality.'

'Yeah. Jekyll and Hyde.'

'Right. Didn't Stevenson come from Edinburgh?'

'Yes. Maybe we do have a split personality,' she said. 'It was in Edinburgh that the crucial moments in the Act of Union were played out. Union with England.'

'Let me guess. Back in 1672.'

'Actually, 1707. It was the best for everybody. The alternative would have been civil war, or maybe war with England. What we gained was stability and prosperity. But what we lost was – something you can't define. Edinburgh used to be a capital. It never would be again. So, I think we've all gone slowly crazy.'

'Conflicts in the programming,' Henry said. 'A city called Hal.'

'Something like that.'

'You Brits amaze me. The way you're so hung up on stuff that happened so long ago.'

'And *you* guys *have* no history. History sticks around.'

He glanced around, at Princes Street Gardens, the park which descended in the shadow of Castle Rock. 'Was this a river bed?'

'No. But it was a loch. Artificial. Used to dump their sewage in it –'

'And drown witches.'

'Actually, yes. They drained it, to make the New Town.'

'So, lunch ...'

It was still early. After a debate they settled on a Seattle's Best Coffee outlet, which Henry was surprised to find here, and they drank lattes and ate immense chocolate chip cookies.

It was a relief to get in out of the cold.

'Your work seems to be going better,' she said.

'You mean I'm not complaining so much.'

'How come?'

He couldn't see any way to escape, so he pulled a package from his jacket pocket, and told her the truth.

It was a courier package from Houston. It contained a tape and a transcript of a conversation with Jays Malone, in which the old guy had evidently done his very best to ransack his memories, and provide Henry with the context he needed.

He tried to explain this to Jane. 'Geology is about decrypting a tangled story: how a rock was formed, how it got where it was and what happened to it since is as important as what it's made of. That's what we call context. And that's what Jays has given me here.' He scratched his head. 'I'm no fan of Man-in-Space. Not when it cuts into good unmanned science missions.'

'Including your own.'

'Yes. But the astronauts weren't bad geologists, on the whole, when they tried. Pilots are trained to be observers, after all, and they all had strong, flexible minds. I suspect they competed with each other to turn in good performances as scientists.'



Jane leafed through the little package, complete with a few sketch maps and diagrams in Jays's spidery old man's hand. There was a brief note in there, which Jane now found.

She eyed Henry. 'So who's Geena?'

He winced. 'My ex-wife.'

She nodded, impassive, and handed him the note. 'So what is this? Is she building a bridge?'

Henry glanced at the note again. Geena was about to go into purdah, working as a capcom on the current Station mission, and beginning the long process of training for her next flight ...

'No,' he said. 'Not a bridge. This is Geena waving farewell from the far side of the ravine. *Good luck with your life.*'

'Sad,' Jane said.

'History.'

'I think I'm starting to understand you,' she said, studying him.

He felt uncomfortable under the scrutiny. 'You are?'

'You really are a true scientist. You like figuring out how the world works. You like the fact that it works logically at all. You find that comforting.'

He rubbed his cheek. 'I guess that's true. Take the Moon. The Moon is very different from the Earth, but the basic principles still apply. Like stratigraphy –'

'Like what?'

'On Earth, in general, younger formations lie on top of older formations. Think about the Grand Canyon. A big slice down through millions of years of sedimentary layers, older under younger, older under younger. And it's the same on the Moon. The big impact that created the Mare Imbrium, for instance, pretty much blanketed the Moon with debris – all of about the same age. So you can tell almost at a glance, anywhere on the Moon, whether a given unit is younger or older than Imbrium. When I learned for the first time that on the Moon, the logic of geology works just the same as in Arizona ... well. Isn't it something?'

'It is to you anyhow. And you're talking too much again.'

'I have the feeling,' he said slowly, 'you are diagnosing me as an anal retentive.'

'I'm not diagnosing. I'm just trying to understand.'

He ran his spoon around the crusted rim of his cup. 'I guess we don't have much in common.'

'I think you're wrong.'

'You do?'

'I seem to be tuned in to patterns in the universe too. Trends and laws. The difference is,' she said, 'I don't take much comfort out of what the patterns tell me about the future.'

They were silent for a while.

She leaned forward. 'Do you have to go back to work?'

'Yes.' He thought about it. 'No, not necessarily.'

'Maybe we could skip dinner.'

He looked into her eyes. 'Oh.'

She said nothing.

He thought it over. 'Let me pick up the tab.'

'No. My shout.'

They stood up.

They went back to Henry's hotel room, in the Balmoral.

It was ... memorable.

She was tender, loving, funny. Whereas Geena had always had that chilling air of assessing his athletic prowess the whole time.

But it wasn't as if they were obvious soul mates. Jane was smart, and logical, but she was obviously coming to quite different conclusions about the world from his own.

Maybe they were complementary, somehow.

He remembered a story, he thought by Plato. How, at the beginning of time, human beings were split in two, by a malevolent god, into halves: male and female. They ran around the Earth thereafter, searching blindly, never happy.

Unless the two halves of a whole, by chance, met up and joined. Once joined, they were complete, and would never part again.

With Jane, it felt like that.

He hardly knew her, he realized. But he felt comfortable in her silence.

Later, lying beside her, he found himself thinking about the liquefaction patch.

He'd been up there, to the Seat, two or three times a week since they first found that puddle. And every time he'd found it had grown.

It was hard to be precise – much of the spread was subsurface – and he was only measuring with shoe leather anyhow. But he was pretty sure the growth was exponential. Doubling every few days.

He recalled Jane's question about telling somebody.

What the hell *was* this? And how, indeed, could it be stopped?

Because if it couldn't –

He started to worry.

He leaned over in bed, and picked up the phone. 'Can you tell me how to get an outside line?'

He got out of bed, and padded to the cupboard where he'd hung up his jacket. In his wallet he had a card with the number of VDAP, the Volcano Disaster Assistance Program at the US Geological Survey.

He dialled the number, and tapped the card on his teeth. 'Never leave home without it ... Hey.' He checked his watch. 'Sorry to disturb you so early. Could you put me through to Blue Ishiguro?'

## II

Henry emerged from the lab's fluorescent harshness into bright afternoon daylight. In his rental car he drove the short distance to Holyrood Park, and, pulling on his rad-proof poncho, walked up the Seat, leaving the traffic noises behind. He drank in the warm, fresh air of this mid-April day. He was coming to like Scotland, he thought; there was something refreshing about the air here, the very light. Something northern.

He had now got into the habit of doing this, walking out to monitor the disfigurement of the Seat, every day.

Today he found the biggest dust pools had been cordoned off by plastic police tape fixed to metal posts. Not far from the site where St Anthony's Chapel used to stand – now just an anonymous patch in the glass-smooth surface of a dust pit – a young policewoman was standing. She wasn't like the cops back home. She wore a blue sweater and tie, and the heavy equipment that dangled from her belt was just a radio. No gun. She didn't look like she needed it.

Henry walked up to her, introduced himself, and told her he was here to study the site. He offered to show her some credentials, but she waved him away.

'Go ahead, Dr Meacher.' Her accent was crisp and precise; she was cheery, dapper, competent, very Scottish. 'I've seen you on the TV.' That was likely; he'd featured, to his chagrin, as a strange-but-true item on the local news, the eccentric Yank here to study the Moon rock. 'Besides,' she said, 'I can see the hammer on your belt. Just don't fall in.'

'I won't.'

'There are Government scientists coming up to study this. It's caused quite a stir.'

'I'll bet it has.'

She nodded. 'We're going to need more cordon tape, aren't we?'

'That you are. Take care, officer –'

'Constable Decker.'

He left her at her post.

He set himself to walk around the perimeter of the primary pool at the summit – as close as he could get, given the police tape – counting his paces as he went.

The pool lay over the craggy agglomerate like a silvery blanket, dimly reflecting the afternoon sun, like a splash of mercury paint. In some places it had actually adjusted the shape of the Seat; bits of the old plug had subsided into the spreading silvery pool, as if dissolved in some powerful acid.

He approached his starting point once more.

There was Constable Decker, standing relaxed, and a little further down the hillside there was the patient group of cultists. Just like every day, they seemed happy; he could hear guitars, folk songs, raucous laughter. A TV crew was making some kind of report, a girl reporter being filmed against the glimmering background of the Seat's wound. The reporter was in a radiation-proofed smock, but most of the other people here weren't.

The whole incident was turning into a kind of low-grade circus, he thought, an item for the end of the TV news, a little scary but too strange to take seriously, like skateboarding dogs and skydiving wedding parties and Moonstruck Yank geologists.

Henry had a palm-top computer in his jacket pocket; he pulled it out. He entered the paces he'd counted, made an adjustment for the fact that he hadn't been able to approach the rim of the pool as closely as before because of the tape, divided by pi on the assumption that the pool was circular ... He entered the new data point onto a log-log graph he'd set up in the palm-top. The graph reduced the growth pattern to a straight line.

The new point was close to the line he'd established with his earlier data.

The growth he saw today was just what he'd found before. Steady. Relentless.

'I was right about the damn police tape,' he muttered.

He expanded the scale of his graph. He would be able to figure out how far out this shit would reach, given time ... It wasn't reassuring.

This was the easy part, of course. And he had already started to skew the work in the lab, focusing on this accelerating phenomenon, with studies of field samples, literature searches and phone calls to check on comparable cases (there were none). That was easy, too, all under his control, more or less.

The tough part was figuring out what the hell to do about this, how to tell people. From that, he found himself shying away. It wasn't any part of his career plan to become a prophet of doom.

But if his numbers were right – if the phenomenon wasn't self-limiting, if this inexorable growth continued – soon he wasn't going to have a lot of choice.

Afterwards, Henry walked up the glacial tail of Castle Rock, towards the Castle grounds themselves.

The crest of the tail was topped by a chain of streets known collectively as the Royal Mile. The buildings here, the heart of the Old Town, were antiques, and some were imposing, like the uncompromising block of St Giles' Cathedral; and it was startling to see, peering through steep alleys, a glimpse of the blue waters of the Firth. But to Henry the place was polluted by twee tourist shops selling junk, kilts and bagpipes and whisky marmalade and Scottish ancestry gizmos.

But some of the pubs were good. And he had to admit he had paid his dollar to go see the Camera Obscura, a Victorian sightseeing gimmick that worked better than he had expected.

Castle Rock was another volcanic plug, smaller than Arthur's Seat but of the same vintage, sprouting from the same underground magmatic complex. The Castle itself was a sandstone mound of buildings, walls and turrets and battlements, looking as if it had grown out of the basaltic crag on which it was built.

He walked around the grounds, inspecting the basalt that underpinned the Castle – in some cases, rocky outcrops had simply been incorporated into the walls – but to Henry's relief there was no sign here of the contamination which had disfigured the Seat.

He climbed to the Upper Ward, and looked out from the cannon-platform terrace to the north. He could see the railway line and Princes Street, two great avenues stretching west to east, converging towards the odd structures on Calton Hill to the north-east. Between the rail line and Princes Street was the garden, that old drained loch. It was studded with trees, a little marred by a huge white marquee where – Henry had learned – a band played during the summer arts festival. Beyond that was the cluttered landscape of the New Town, with its sandstone monuments – the Scott Monument, his own Balmoral Hotel, the banks and insurance companies on George Street – jutting out of the forest of roofs, and beyond that, serene and calm, was the blue surface of the Firth of Forth, and the rocky northern coast.

The lights were coming on, and in Princes Street the crowds were starting to bustle out of the shops and offices and making their way home, their radiation-proofed smocks and ponchos bright, bustling human activity at the heart of the ancient city.

He felt as if he was somehow opening up, as if walls in his head were crumbling. He wasn't used to feeling so engaged with humanity as this.

Maybe it was something to do with Jane.

This was Lilliput, small and crowded: a thousand years old, and beautiful. It seemed impossible that it should be under threat – a threat only he perceived.

Venus. The Moon rock anomalies. The Arthur's Seat dust.

The pieces of the puzzle seemed to be moving around in his head, colliding, trying to find ways to fit. But the essence of the future was clear to him; the inexorable growth of that stuff on Arthur's Seat would see to that.

Bad news.

Unless he, and those who worked with him, found a way to stop it.

‘We have to, is all,’ he said to himself. ‘If not us, who else?’

For a while longer he gazed out over Edinburgh’s bustle.

Then he began the walk back to the town, to meet Blue.

Henry had a little trouble meeting up with Blue Ishiguro, in the subterranean clamour of Waverley Station. Blue wasn’t much over five five and was skinny as a rake, so it was hard to spot him among all these heavy-set, overfed *gaijin*, as Henry always thought of Westerners when he was around Japanese.

But here Blue came at last, his pencil-thin frame all but overwhelmed by the giant, battered field rucksack he carried on his back, his button-small face split by a giant shit-eating grin.

Henry embraced Blue, and they went into a mock-boxing routine, what Blue, who had spent maybe too long in America, always called hoopin’ and hollerin’ mode.

Blue said, ‘It’s good to see you, man.’

‘That’s the truth. Let’s get out of here.’

They emerged into the centre of the city. Blue hitched his pack on his back and looked around curiously. They set off west down Princes Street, which ran straight as an arrow towards the spires of St Mary’s Cathedral, to find the guest house Blue had booked for himself.

It was a little after eight in the evening, so the end-of-day crowd had subsided from its peak, and the light was starting to go. All the monuments of the city seemed to be bathed in yellow-gold floodlights: the Castle on its shapeless volcanic mound, the Balmoral Hotel, and the memorial for Walter Scott which looked, Henry thought, like a Saturn V launch gantry rendered in sandstone, turned black as coal by pollution, which the monument was too fragile to have washed off.

‘So,’ said Henry. ‘What do you think?’

Blue gazed around, his rheumy eyes analytical. ‘Skinny,’ he said. ‘England has a lot of skinny buildings.’

‘It may do. But this is Scotland.’

‘Whatever. And it’s kind of grubby from the pollution.’

‘True enough.’

‘So where’s the volcano?’

Henry clapped him on the shoulder. ‘Tomorrow, old man. You need to sleep off your jet lag.’

Blue sighed. ‘I suppose you are right.’

They arrived in a small, straight side-street in the west of the city, not far from the shadow of St Mary’s. The guest house was a rambling, much-extended building next to a cobbled courtyard, entered by a narrow archway. The ground floor was pretty much a pub, a long bar gleaming with glass and leather, circular brass tables crowded with drinkers cradling pints in straight glasses; cigarette smoke hung like a volcanic pall in the air.

Blue grinned at Henry. ‘I think I will like it here.’

He didn’t object when Henry picked up his rucksack to carry it up the two flights of stairs to his room (no elevator, of course). The room, when they got to it, was just a box, not much bigger than a bed and a shower stall.

Back in the bar, which was still more crowded than before, Blue insisted on buying the drinks. They sat at a table in the corner, sticky with stale beer, and Blue waited patiently, until Henry had to explain that in a British pub you had to go up to the bar and order your drinks and bring them back. On the other hand, in cafés and restaurants you were supposed to wait for service ... and so forth. Blue accepted all this serenely, went to the bar, and came back with two glasses full to the brim with heavy Scottish bitter.

‘Here’s to you,’ Henry said.

‘*Kampai!*’

The beer was heavy, flat and warm; Henry was working at getting used to the stuff, but he had a ways to go yet.

‘Your room’s kind of small,’ he said.

Blue laughed. ‘So small that if I cussed a cat I’d get hair in my mouth. It’s fine, my friend. I have my *tatami* mat and my happy coat and my portable family shrine, though I’m not sure where I will place it. The shower stall, perhaps. I think this place has a certain charm. Did you know it used to be a coaching inn? And you can see how old it is, so old it has had time to subside. Think about that, Henry. This place is probably older than all but two or three buildings on your whole continent.’

‘But not Japan.’

‘Not Japan, no.’

‘Well, these old Brit places are better than they used to be, I guess. At least you get a shower in your room now. But –’

‘But you can’t polish a turd.’

Henry grinned. ‘I’m glad to have you here, my friend.’

Blue eyed Henry. ‘I take it you don’t want to talk about work.’

‘Not until tomorrow. I need you refreshed. I need your clear thinking.’

‘There are no live volcanoes in Scotland,’ Blue pointed out. ‘Not for three hundred million years.’

‘I know. And I don’t think we have one now. What we have is –’

‘What?’

‘Something not right.’

‘It scares you.’

‘Yes, it does,’ Henry said.

Blue grunted and raised his glass. ‘But that is for tomorrow. For tonight, we will do what old men like us always do, which is to talk about old times. Tell me, do you still hear from the Pinatubo team?’

Pinatubo was a volcano in the Philippines. Henry and Blue had been part of a joint team of USGS and Philippine volcanologists who had gone out to assess the danger of eruption. Because of the accuracy of their characterization of the hazards and their prediction of eruption, more than fifty thousand people had been evacuated to safety, days before Pinatubo’s devastating eruptions.

Henry, fresh from college, had done little more than carry the gear, but it had been his first exposure to real field work, and to a major geological event. And to what it could do to people.

So they gassed about that.

‘Not that we were so smart about Pinatubo,’ Henry said. ‘You remember Sister Assumpta?’

Blue laughed. ‘Of course.’ This was the nun who had walked into the Philippine Institute of Volcanology to tell the assembled scientists, peering at their instruments in the artificial light there, that, begging their pardon, the mountain had just exploded. And so it had, clearly visible from her village; but that nun’s soft-spoken message was the first warning anybody had.

So they talked about that for a while. Then Henry went up to buy some more drinks, and they talked about the time in Colombia when Blue had absent-mindedly walked over terrain so hot that when he took off his boots his socks were smoking ... and so on.

Blue kept up, but he looked thin and frail compared to the booming, bovine *gaijin* around him, and every now and again he would turn away and cough deeply into a huge handkerchief, the phlegm liquid in his throat. He had visibly crumbled in the few years since Henry had seen him last, and that was a true pisser.

Blue wasn’t admitting to any of it, but the word was he had asthma, and maybe heart trouble. Which was why VDAP hadn’t allowed him out of Vancouver and into the field for a couple of years, and – no doubt – why Blue had been so keen to come for a jaunt to Britain, on Henry’s obscure and ambiguous invitation.

Blue was driven to keep working. Everyone who knew him knew that, and knew why. Kobe.

But that wasn't Blue's fault. Why the hell should he have to give up, to retire, to succumb to the betrayal of his body?

Henry felt a deep, unfocused anger boiling up inside him. *Age*. It was so damn medieval that they all had to submit to such a thing. He himself was already old enough to feel the weight of age descending on his own bones. It just went on and on, it seemed, wearing you down, taking out everybody from the best and brightest on down. And nobody got a reprieve, not so much as a day off from it.

He thought of the patch on Arthur's Seat, spreading like the liver spots on the thin skin of Blue's bird-boned hand. Was that what it was? – a sign that even the Earth, in the end, grew old?

You've drunk too much of this British piss, he thought. The next time he went to the bar he came back with Becks, which was the nearest they had to a clean American beer.

## 12

He arranged to meet Blue up on the Seat the next afternoon.

In the morning, with a mildly banging head, he made his way to the lab.

He made a run around the building, checking on the progress of his samples in the various labs. Here was the X-ray fluorescence spectrometer, for instance, an anonymous grey box which looked like an industrial-strength photocopier, into which ground-up fragments of his rocks were fed in tiny platinum egg cups. X-ray fluorescence would tell him about elemental abundances in fine detail.

He was promised by the prep technician that his samples would be in place by the end of the day.

The ion microprobe was the department's million-pound pride and joy. It was set up in a gloomy lab crammed with humming electronic equipment. The heart of the probe was a chest-high complex of stainless steel tubing and chambers. Rock samples, coated in gold plate, were fed into a vacuum chamber and bombarded with fine beams of caesium or oxygen ions, focused by intense electromagnets. There was a little optical microscope you could use to watch the ion beam cutting its little crater into the surface of the sample, like a kid with a magnifying glass scorching his initials on the barn door. But the sample areas were just microns across, only a couple of atoms deep. The layers of atoms, sputtered off into a mass spectrometer, revealed the elemental composition of the sample, and such details as the temperature the crystal structures formed at.

It was an impressive piece of equipment – one of just four in geology labs around the world – or at least it seemed so until you realized that Motorola alone had *four* of the beasts, for use in their silicon chip quality control procedures. The academic community was undoubtedly the poor relation of business and government, and in Britain things seemed to be even worse than in the States.

Henry's work, it seemed, was next in the queue behind a meteorite analysis that was overrunning, after an all-night run. He argued, but got nowhere, and left fuming.

Anyhow, he suspected the composition of the samples wasn't nearly so important, in this case, as their structure. And that was going to be difficult to study here, without the right tools.

When he got to the clean room Mike was there, bright-eyed and depressingly keen, eager to go over the results of X-ray diffraction analyses he had run on samples taken from 86047. The results were simple traces, peaks and troughs. Mike had run the images through the computer already, and was compiling the results when Henry arrived.

But Mike looked flustered, and he was rushing to be ready; Henry had a sinking feeling he had been up all night with this.

At Henry's request, he had also run through some of the bizarre grains Henry had scooped up from the Arthur's Seat dust pool, or whatever the hell it was.

X-ray diffraction was a step beyond the use of polarized light. The wavelength of visible light was much bigger than atomic size. X-rays had a wavelength just about the size of a typical atom, so they could show atomic structure: the crystal structure of silicates, for instance. The spacing of the peaks and troughs on Mike's results showed the crystallographic spacing of the sample. The trick was to map back from these simple patterns to figure what the underlying crystal structure must be.

It was complex. But diffraction results were unambiguous. And every so often you would run into a new crystal form.

And that, Henry realized with an odd stir of anticipation and dread, was what seemed to have happened here.

And not just with the Moon rock, which you might expect with such an exotic sample. There was, Mike said, something different about the Edinburgh sample, too.

They looked at the 86047 results first. Mike had prepared a summary diagram on a pc screen.

Inside the Moon rock's potato-shaped profile, roughly sketched with graphic software, Mike had marked layers, as if the rock was a misshapen onion.



'I took samples from all the way through the rock,' Mike said. 'You can see it has this structure –'  
'Structure? What are you talking about? It's a *rock sample*. It ought to be a homogenized lump –'  
'Nevertheless,' Mike said. He sounded nervous, maybe pissed off, and Henry made a conscious decision to back off. Mike said, 'This is predominantly olivine.' He pointed to a band marked in red, just inside a grey band that made up the surface of the rock. 'Then, going inward, we have, in order, layers of tourmaline, a pyroxene mix, amphiboles, mica, quartz.' That took his finger to the core of the rock, which he'd left as white.

'So what's in there? And what's in the outside layer?'

'I can't say.'

'You *can't* say?'

'Not from the diffraction results. But I know they are silicate forms. I did some chemical analysis to prove that. I can show you the results from the earlier optical emission and X-ray fluorescence tests which –'

'Later. I believe you.'

'The stuff at the centre seems to be hard and dense. Rigid.'

'Some kind of super-quartz, maybe?'

'Maybe. Some very complex structure, anyhow.' Mike hesitated, watching him. 'Some of us are speculating it might fold up all the way into the fourth dimension. Ha-ha.'

That didn't make Henry feel like laughing.

He tried to keep the frustration out of his voice. 'Well, we still don't know what we've got here. We need to order more of these runs. Bump up the priority. I'm getting tired of queuing behind asshole grad students.'

Mike made a note. 'I'll call Marge Case.'

'Don't let her give you any shit. And, Christ, this just isn't fine enough. We need some scanning tunnelling microscope time.'

Mike sighed. 'Well, we don't *have* an STM. As you know.'

'All right. What about the surface stuff?'

'It's a dust,' said Mike. 'Very fine. Almost no cohesion or adhesion. If you disturb the sample at all, layers of it just fall off.'

Henry frowned. 'That makes no sense. That damn rock was picked up by some galoot on the Moon, and then dropped from two hundred and fifty thousand miles into the Indian Ocean. That's what I *call* disturbance. Anything loose should have been shaken off long ago.'

'I know,' Mike said. 'I'm just telling you what I found.'

Henry pulled at his lip.

New forms of silicates?

It wasn't impossible. There were lots of ways to make crystal structures out of the silicon anion, the fundamental silicon-oxygen tetrahedral building block.

But 86047 was just a rock, a fragment of some larger body that broke off an aeon or two ago. Why should it have this neat internal structure?

It was, he mused absently, as if something was living in there. Working, burrowing deeper into the rock, chewing up the olivine and leaving behind these deeper, complex layers ...

'Mike, I want you to repeat these tests. Keep on with the other stuff, the more detailed work, but go over this again. Every couple of days. See if there's any change.'

'Change?' Mike frowned. 'In a piece of rock billions of years old? How can there be any change? What kind of change?'

'If I knew, I wouldn't need you to run the tests.'

Mike made another note.

Very fine dust. Almost no cohesion or adhesion ...

'What about the Arthur's Seat samples?'

Mike had passed that work to another researcher. It took him a couple of minutes to retrieve the diffraction results from the intranet.

The diffraction pattern was unidentifiable. A silicate form nobody had seen before.

Nevertheless, to Henry, it looked familiar.

He had Mike call up the 86047 results again, and overlaid the two.

They were the same.

The diffraction results, of this sample of pulverized basalt from Edinburgh, and of the ancient Moon rock, were all but identical.

‘Now,’ Henry said, ‘what the hell do we have here? What is the connection between this battered old piece of the Moon, and an innocent Edinburgh landscape?’

But Mike turned away, oddly reluctant to respond.

Mysteries on mysteries, Henry thought, puzzled by Mike’s reaction.

When he went up to the Seat, he found Blue and Jane waiting for him.

‘I see you found each other.’

Blue was grinning so wide his teeth were twinkling. ‘I see *you* found each other,’ he said.

‘Knock it off.’

Jane said, ‘I was over with the cultists –’

Blue giggled. ‘She saw me sniffing the rocks.’

‘So I knew he had to be something to do with you.’

‘I’m glad you two are getting along,’ Henry said drily.

‘I’ve been telling her all about your past,’ said Blue.

‘Oh, shit.’

‘Yeah,’ Jane said. ‘Blue tells me his hotel is okay, but they are – what did you say?’

‘Skinning me like a country chicken.’ Blue cackled.

She said drily, ‘So *which* part of Arkansas are you from?’

‘Come on, Blue,’ Henry said. ‘We’re here to work.’

Blue nodded. ‘We need to get closer. The young lady –’ he nodded at Constable Decker ‘– will allow us through the tape.’

‘She will?’

‘I vouched for you,’ said Blue.

They lifted the tape and ducked underneath it. Cautiously, they approached the edge of the summit dust pool – which, once more, had spread since Henry last looked. It sprawled, ragged, over the lumpy rock.

Blue threw lumps of turf into the pool – they disappeared immediately, without so much as a ripple – and he kneeled down, a little stiffly, to sniff the air.

Blue said, ‘It might be liquefaction.’

Jane said, ‘What’s liquefaction, exactly?’

Henry said, ‘Where earth tremors shake up certain kinds of soils. Seismic shear waves passing through a saturated granular soil layer distort its structure, and that causes some of the void spaces to collapse –’

‘In English.’

‘For a while, the soil acts like a liquid.’

‘But,’ Blue said, ‘liquefaction is only found when the sands and silts were deposited recently.’

Jane said, ‘Recently?’

Henry shrugged. ‘Say, less than ten thousand years ago.’

‘Even then,’ Blue said, ‘you need ground water within thirty yards of the surface ... This is an ancient volcanic plug. I can’t believe this is liquefaction, as we understand it.’

‘Then what?’

He spread his frail hands. ‘I’ve never seen anything like it.’

‘Congratulate me,’ said Henry. ‘A new geological breakthrough.’

Blue drawled, ‘Even a blind pig finds an acorn sometimes.’

But the banter was, Henry thought, on auto-pilot. Blue seemed to share some of his own sense of dread, as he stood here and studied this unclassifiable phenomenon.

‘So,’ Jane said, ‘what are you going to do now?’

‘I think we should bring the portable lab out here,’ Blue said.

‘What portable lab?’

Henry said, ‘He means the VDAP’s. That’s the Volcanic Disaster Assistance Program. A kind of volcano SWAT team run by the US Geological Survey. They have a portable lab for studying geological disturbances which –’

‘Oh, sure,’ she said. ‘Why don’t you get your ex-wife to beam it down from the Space Shuttle?’

‘Jane –’

‘This isn’t the Third World, you know. Even if it was, you would still be a patronizing arsehole American.’

Henry eyed Blue. ‘Of course she’s right. Everything we need should be here.’

‘Okay,’ Blue said. ‘So we wire the mountain. We need seismometers. A network of them, at the rim, on high-gain rock sites. They will have to be moved regularly as the pool progresses, I suppose ... We’ll need volunteers for that. The seismos will be linked by radio telemetry to a central point.’

‘We’ll use my lab,’ Henry said. ‘We’ll need a war room.’

‘Why a network of seismometers?’ Jane asked. ‘Why not just one or two?’

‘Because we have to triangulate,’ Blue said with gracious patience. ‘We must locate the movements of the ground in three dimensions.’

Henry said, ‘What else?’

‘We should do some real-time and spectral seismic analysis, to understand the growth of this phenomenon.’

‘Deformation monitors?’ To Jane he explained, ‘When magma builds up beneath a volcano the ground distorts.’

‘Yes,’ Blue said. ‘Whatever you can find. Ideally laser based EDMs –’

‘Electronic distance meters,’ Henry told Jane.

‘And GPS receivers.’

‘Global –’

‘Positioning System?’ she said with some satisfaction.

‘A cospec for gas emissions,’ Blue said.

‘Yeah.’

‘Henry, I’d really like BOB here.’

Jane said, ‘Who’s BOB?’

Henry smiled. ‘A VDAP computer program. For rapid analysis of time-series data in crisis situations. Okay. And I’d like to order up regular aerial surveys to map the changing extent of the thing. My shoe-leather metrics really aren’t good enough. Later we should think about acoustic flow monitors if there are lahars, microbarographs –’

Jane said, ‘That sounds like it detects changes in atmospheric pressure.’

‘So it does.’

‘Why that?’

‘Because it’s a good predictor of a volcanic explosion.’

‘... Oh.’ She was looking at the pool rim. ‘Look at this,’ she said. She pointed to a patch at the rim of the pool, where bare rock showed through the grass.

A foot-wide patch of rock was – Henry thought, shielding his eyes against the sunlight – *glowing*. The rock flashed. Henry jumped back. He’d felt heat on his face.

When he looked again, the rock was changed. It had turned to the fine silvery dust, characteristic of the rest of the pool.

‘Holy shit,’ Henry said. ‘Did you see that?’

Blue said, ‘At least we know how it spreads now.’

Jane looked from one to the other. ‘I can’t quite read you two,’ she said. ‘You are interested in all this. Fascinated, even. But, underneath that ... You’re afraid, aren’t you?’

Henry and Blue exchanged a glance.

‘Why?’ said Jane. ‘*Do* you think this is a volcanic event? Arthur’s Seat has been dormant for a third of a billion years. Do you think it’s becoming active now?’

‘We don’t know. This isn’t like any volcanic event we’ve faced before.’

‘Then what is it?’

‘We don’t know that either.’

She nodded. ‘And that’s what’s frightening you.’

‘Yes,’ Blue said. ‘That is what is frightening us.’

‘The growth rate has been maintained for weeks,’ Henry said. ‘The pool is still pretty small now, but it’s not going to stay that way.’ He regarded Jane. ‘We have to be ready to face that.’

‘I understand.’

Blue was studying the air. ‘It is blowing away.’

‘What?’

‘The dust. Spreading in the breeze.’

Jane asked, ‘Is that important?’

‘I don’t know.’

Blue was glaring at the dust, his face a sour mask.

‘So,’ Henry said. ‘What do you think, old friend?’

Blue sniffed. ‘This is something which should not be here. It is like a cancer, on the face of a good friend.’

Yes, Henry thought. That was exactly it.

Something new. And unwelcome.

Bad news.

They made their slow way down the Seat.

## 13

One more time to make love. Maybe the last time.

I have to stop thinking like this, thought Monica Beus. I'll finish up doing a countdown ...

But still, here was dear old Alfred, as tender and gentle as he ever was, and, in the cool mountain air that filled Monica's apartment here in Aspen, they coupled like two elderly spacecraft gingerly docking.

Athletics, it wasn't.

But it hadn't hurt as much as she had expected. Maybe the quacks were right; maybe their new, 'natural' chemotherapy regime really was a little less brutal.

And afterwards, they shared the post-coital cigarette they were both too old ever to give up – and what would be the point anyhow? – and then they sat up in bed, blankets around their bony shoulders.

And they pulled their computers to their laps and went back to work.

Alfred got online to the International Astronomical Union nets, and Monica skimmed through the latest entries to the electronic preprints library being maintained by the National Laboratory at Los Alamos.

The papers on string theory, since the Venus incident, had become a blizzard. The excitement seemed to crackle out of the screen at her.

But Alfred had found something new on the astronomy nets and was becoming excited too.

Now people had started looking – NASA had hastily thrown up a couple of new satellites – they were starting to find signatures like the Venus event's all over the sky. Alfred tapped the screen to show her. 'Like these. Gamma ray bursts. Called GRBs by those who study them. Flashes of energy, emanating from explosions that lasted a few seconds ...'

Huge explosions, he told her. By some estimates, radiating more energy in a few seconds than the sun does in ten billion years. There were lots of candidate explanations, none of them particularly satisfactory. Maybe asteroids were crashing onto the surfaces of neutron stars. Maybe neutron stars were colliding. Maybe giant helium stars were imploding.

'Or maybe,' Alfred said feverishly, 'some interstellar cousin of our Venus killer is at work ...'

She found it hard to concentrate on what he was saying, given the buzz on the Los Alamos nets.

She tried to summarize for him what had been going on in the world of theoretical physics, galvanized as it was by the natural laboratory which Venus had somehow, magically, turned into. 'Alfred, string theory is the best way we have to describe the kind of extremely high energy density events we're encountering inside Venus ...'

String theory was a candidate Theory of Everything – which, if successful, would be a simple theory whose corollaries would describe a universe that was unmistakably *ours*: with quarks and electrons, gravity, nuclear forces and electromagnetism, three space dimensions and one of time, a universe of atoms and babies and stars.

'According to string theory,' Monica said, 'the most elementary object in the universe is a loop of string. Unimaginably tiny. Ten to minus thirty-three centimetres ... The string has different modes of vibration. Like a violin string. Each mode corresponds to a particle, a quark or an electron. And the laws of physics correspond to harmonies between the strings' tones.'

'Ah.' He smiled. 'The Universe as a symphony. Rather beautiful.'

'But,' she said, 'there's a complication. String theory only works in a ten-dimensional space-time.'

Alfred rolled his eyes. 'I always hated theoreticians.'

'Now, the missing six dimensions are there, but they are crumpled up. Like garden hoses, rolled around themselves.'

Alfred struggled with that. 'So these dimensions are there. But too small to see.'

Monica hesitated. 'Something like that. Yes. The trouble is, there are tens of thousands of ways for the six dimensions to crumple. Each of those different ways generates a different internal space, as we call it. And in each internal space, the strings adopt a different solution.'

'A different solution?'

'One internal space describes our universe, with three types of electron, and one photon. Another might have two photons. Or something even more exotic. And so on.' Monica leaned forward. 'Now. The theoreticians are suggesting there is a – tear in space – at the heart of Venus. Or what Venus has been made into.'

'A tear?'

'A way into another internal space. You see, when a string enters a new internal space, it adopts a different configuration.' She cast around for an analogy. 'Like ice. Take it from the Arctic to the Sahara, and it melts. Vaporizes. It adopts a configuration that's suitable for the environment.'

'And so ...'

'And so, at the heart of Venus, we think we're seeing strings being ripped apart. Literally. Maybe even being expanded to macro lengths before collapsing back down to new configurations.'

'Hence, the exotic particles we've observed.'

'Elementary particles as massive as bacteria. Yes.'

'A tear in space, in the heart of the Solar System,' he mused. 'A pocket universe ... Strange days indeed.'

'Certainly we're looking at a release of energy more than enough to overcome gravitational binding energy.'

'Umm. But *why*?' Alfred asked. 'What's it *for*?'

'Since we've no idea how this is being done,' she said, 'we're nowhere near an answer to that.'

She scanned through more preprints. A flood of them, a kaleidoscope of theory, scattered shards of calculation and insight and speculation. Too much for anyone to read, let alone review. 'Makes me wish I was young again,' she said.

'Umm?'

'The *excitement* out there. String theory describes the high energy stuff. Energies of up to ten to power nineteen giga-electronvolts. Which is ten million *billion* times higher than anything we could create in any conceivable accelerator. So much was hidden from us, in this low-energy world we inhabit. Like trying to deduce the nature of a lion, after being given a glimpse of his tail.'

'And string theory is a description of the rest of the lion.'

'With about as much guesswork involved. Yes. But now, it's as if Venus has conveniently transmuted into the biggest particle accelerator in the universe. We can *see* the stuff we struggled to describe before. Now, even the sceptical types are saying we might reach a true Theory of Everything in five, ten years at most. The excitement is extraordinary ...'

But now Alfred had found something else on the IAU net. Evidence of more Planckian cosmic radiation, just a trickle of it, coming – not from a remote planet, not from exotic sources that lay maybe beyond the Galaxy itself – but a lot closer to home.

He pulled up a sketchy diagram from a new preprint: a circle centred on a schematic Earth, two points picked out on the orbit of the Moon. 'L4 and L5. Gravitationally stable, like shallow pits in spacetime: the places in the Moon's orbit, ahead of it and behind it, where you'd expect debris to collect. Dust, whatever.'

She looked at the closely-printed text, tried to follow it. 'What are they saying? That the Venus killer is there?'

'No. Just that, on a small scale, the processes we're observing on Venus are replicated there, on a much smaller scale.'

She frowned. 'How so? Something working on the raw material there? But what?'

‘I don’t know.’

‘And how did it get there? Did it start on Venus, and come here, to Earth-Moon? Or ...’ Or did it start here, on Earth or Moon, and spread out across space, to Venus?

There was, of course, no answer: merely new pieces of the puzzle, fragmentary glimpses, imperfectly described by the staid, passive language of technical papers.

Glimpses of something monstrous.

She wondered how she was going to express this to the Administration.

Something had turned Venus into a kind of giant particle accelerator, orders of magnitude more powerful than anything humans had ever conceived. But that great experiment had wrecked the planet, literally disassembled it, from the core outwards, blowing its surface and atmosphere into space over a timescale, as far as anyone could tell, of no more than a few months.

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