

Geoffrey A. Landis ELEMENTAL

1. Ramsey

Fifty kilometers southeast of Naples, two men sat waiting in the bright fluorescent-lit power control room of Napoli Spaceport. In front of them glowed an array of green lights and computer consoles. Behind them, outlined on the floor in a violet glow only faintly visible in the brightness of the room, was a complex five-fold symmetric figure: a pentacle.

The younger man watched the array of dials intensely, occasionally touching a knob to make some infinitesimal adjustment. The older man watched him work. What he saw seemed to satisfy him, for he strolled over to the window and gazed out across the landing field.

Without looking up, the younger man spoke: "Luna shuttle's about ready to lift, Mr. Layr."

"Ready for it, Carlo?"

"Running steady at a hundred ten percent, sir."

"She's all yours." Christian Layr walked over to a monitor screen where he could watch the youth's performance and take over if necessary. He doubted that any such necessity would arise. There is a certain skill to controlling magic, a skill of balance and timing not unlike that of a juggler, and the boy had it. Layr almost wished something would go wrong, so he could see how the boy would handle it. The youth had the talent, but Layr would feel uneasy about certifying him until he saw how he tackled a real problem, one of the minor emergencies that make power control a job for men with skill and courage, rather than a simple task for machines. Despite Layr's unspoken wish, though,

for the last ten days the station had operated smoothly.

Almost too smoothly.

Layr heard the nearly subsonic rumble of power build-up and directed his attention back to the display. Power level a hundred fifteen percent; there would be no problem with this one.

"Here it goes."

Layr glanced up to the window. As if by magic, the blunt-nosed spacecraft appeared from the launch pit to hover for an instant before his eyes. Slowly it began to inch upward, then to hasten forward with an implacable urgency, finally to rush with a clap of thunder headlong into the morning sky, as if all the demons of hell chased after it.

In a sense, they did. Behind him the control pentagram lit the room with a brilliant violet fire as it transmitted the energy flux to shove the thousand-ton shuttle up to parking orbit. Far beneath his feet, the main pentacle glowed, not violet, but gamma. No human eye could ever look upon it in its full glory. Within the impenetrable walls of the protecting spell was confined a more powerful magic yet: two hundred kilograms of pure antimatter. In Chicago it was 7 A.M. Yawning, Ramsey Washington looked out the window of his third-floor apartment. A soft wet snow fell steadily. It masked the outlines of the tenements and weighed down the branches of the evergreen that struggled to grow in the building's entrance courtyard. He cursed softly. Perfect Christmas weather-in April. Some bureaucrat at the weather service must have thought it a good April fool's joke. More likely, he reflected, they'd

needed a blizzard here as the best way to equalize a water imbalance elsewhere in the world. Africa or Antarctica or Alabama or somewhere. Maybe it had been announced and he'd just missed it.

He dug through the cluttered drawers of his desk and came up with a usable piece of blue chalk and a battered secondhand hardcopy of the Handbook of

Thaumaturgy, 2052nd edition. He cleared the accumulation of dirty clothes and half-written papers from a one-meter circle on the floor, then carefully chalked a pentacle, copying exactly the diagram in the book. He chanted the book's recommended spell sequence and stepped inside. Spell completed, he grabbed his data microdisc and headed outside.

As he entered the snowstorm, a circle of warm air formed around him. Although by now the snow was nearly twenty centimeters deep over the walk, where he stepped and for a one meter circle around him the snow vanished, reappearing magically behind him again as he walked onward.

Modern thaumaturgy-usually simply called "magic"-was the logical outgrowth of quantum field theory. The basic premise of thaumaturgy is that "reality" is merely an abstract mathematical construct. Therefore, it can be controlled by the manipulation of abstract symbols-provided that the correct symbols can be chosen. The snow ward which Ramsey took for granted was only one of many changes wrought by the consequent technology.

Protected by his home-made ward, Ramsey ignored the snowstorm swirling about him. As he walked under the low hanging branch of the evergreen in the courtyard he ducked his head instinctively. Anyone as tall as Ramsey quickly learns to duck without ever really noticing it. As he walked under the tree, the snow on the branch above vanished, exorcised by the snow ward. Freed, the branch sprang up, smacking the branch above it and shaking loose a new mound of snow. In a chain reaction of unleashed branches, the whole tree shook itself free of its burden of snow.

Ramsey's low-power spell had been designed to protect against a pretty heavy snowstorm, but it had never been intended to stop an avalanche. The spell overloaded with a loud pop. He abruptly found himself up to his armpits in snow.

Ramsey heard a giggling somewhere behind him, and whirled around to see who was laughing. Unfortunately, the snow was rather more slippery than he'd anticipated. His feet skidded out from under him, and he landed flat on his back in a flurry of snow. Helpless, he heard the giggling rise into a robust laugh. ,

He pulled himself carefully to his feet. "Have you no respect for the mortally wounded?" He shook himself off and glanced surreptitiously at the girl standing on the sidewalk laughing.

"Oh!" The girl rushed over. "I'm sorry! Are you hurt? Where?"

"My dignity, woman, my dignity's taken a mortal wound. I may never recover. "

"Oh, poor baby!" she replied in mock seriousness. "Shall I kiss it and make it better?"

"Hey, that's the best offer I've had all day," said Ramsey. He looked up at the girl and grinned, "Say, you mind if I ask a dumb question? What's your deep in conversation. "I'll need all the luck I can get."

In Italy it was early afternoon. The sun beat down warmly, as might be expected on a day in early April. In the fields, two farmers stopped working the rich volcanic soil to rest in the shade of a solar array. One of them brought out the midday snack of bread, wine, and cheese, while the other hooked the tractors up to recharge.

"Explain once more to Giuseppe how it is that your vines produce so bountifully this year."

"It is because of this amulet of my wife's mother." Luca held up a small piece of carved volcanic rock suspended on a silver chain. Giuseppe looked at it dubiously.

"That? It is no different than the one my wife wears about her neck to ward off the evil eye. Yet my vines do not produce like yours."

"Ah," said Luca smugly, "wearing is not enough. You must know how to use it."

"Ah," said Giuseppe. "So tell me, how is it done, to use this thing?"

"And why is it I should say to you?"

"Come, Luca. Did we not grow up together? Are we not friends? How is it that you would now hold out on your poor friend Giuseppe?" .

"Indeed," said the other, "I would not. This is what is to be done. Each

morning before going into the fields you must take the amulet and make with it this gesture-" he demonstrated with his hands "-and say the following chant-" he intoned a short series of nonsense-sounding syllables.

Giuseppe was still dubious. "That's all?"

"Indeed."

"It would be simple ,enough for me to try. Father Corsi would not approve, though. He would call it witch work."

"There is no need for Father Corsi to know. Besides, he is surely aware of how many of his flock wear charms against the evil eye, no`'"

"Yes. And he calls it idolatry, too."

"But he does not forbid it."

"This is true, he does not. But tell to me, how is it that you know this thing?"

"My cousin Roberto, who was in the navy, learned it from a sailor who had a brother who went to the university to learn science. This sailor knew many things to do with such charms, but only the one of any usefulness."

"So," said Giuseppe. "This does not sound like the devil's work. Indeed, I will do it. Perhaps my vines too will become as bountiful as yours."

"I wish you luck." Luca looked at his wristwatch. "Time now for us both to be back to work." He walked over to his tractor. "Do you remember well the gesture and the words?"

Giuseppe repeated the words, making the gesture Luca had shown. Luca nodded.

"Good. I wish you prosperity, my friend. "

"And you."

As Giuseppe drove the tractor that afternoon he repeated in his mind the words and the gesture. If it worked he would show it to his brother-in-law, who also grew a small plot of grapes behind his fields. And perhaps to his cousin Rafaele? Yes, he decided. Such

a useful thing should not be kept to oneself, but had to be shared with others.

Ramsey looked down at his stack of notes, licked his lips nervously, looked at his watch, and then knocked at the door. Without waiting for a response, he walked confidently in. Doctor Williamson looked up from her desk computer.

"Ah, yes, Mr. Washington. Right on time. I'll be with you in a moment." She turned back to her qwerty.

Ramsey walked over to one of the plush lounge chairs and sat down. He looked at the expensive glass sculpture on the table next to him, then let his eyes wander over to watch her work. What a woman, he thought. She had light brown hair, almost a shade of blonde, cut fashionably short. Today she wore a light green sweater with a gold and green silk scarf wrapped casually around her neck. Dressed in impeccable taste, as always, he thought. I bet she never falls down in the snow on her way in. She flicked the Save switch on the computer and turned to him.

"That outfit looks very good on you, Dr. Williamson." Ramsey remarked casually.

"Thank you. Mr. Washington," she replied curtly. "Now let's get to work, shall we? I presume you've finished the data analysis on your recent run, right?"

"Well, not exactly," Ramsey said. "I've been having a slight problem with the data in the third and fourth quadrants. Nothing important, I'm lure."

"Let's have a look at it." Doctor Williamson reached out a hand. Ramsey quickly dug out his microdisc and gave

it to her. She popped it into the receptacle on her computer and studied the screen for a moment.

"I see," she said. "What do you think this signifies?"

"I'm not really sure," Ramsey replied. "Maybe some localized anomaly in the Earth's field'?"

"Yes, I suppose that's a possibility. Rather unlikely that no one previously ever mentioned it, though, don't you think? After all, people have mapped the magnetic field for several centuries now."

"Maybe it wasn't there before?"

"Now, that seems rather far-fetched, doesn't it? Just where do you suppose such a change would come from? It looks to me much more like the characteristic signature of a magnetometer that has not been properly degaussed before the measurement."

"I calibrated and degaussed the equipment every two hours," Ramsey said.

"Well, Mr. Washington, it certainly looks here as if you missed one, doesn't it? Don't be too glum about it-if we didn't make mistakes, we wouldn't learn anything, now would we? It's the kind of simple mistake everybody makes when just starting out in experimental work. You'll learn to be more careful.

"In the meantime, though, it looks like you'll have to re-do the measurement from about here . . . "she touched the screen, " . . . on. The rest of the measurements, excepting of course that part, are simply marvelous. Fine work." Ramsey smiled ruefully at the compliment. "Thank you."

"I expect that you'll be able to have the whole thing done right by the time I get back from Rome." She walked over to her desk and touched the keypad beside her chair. A calendar appeared on the screen. Looking at it, she said, "I'll expect to see you at 9 A.M. on the sixteenth, a week from Monday. We'll have another little chat then."

She tapped the appointment time onto the computer and it appeared dutifully on the calendar.

"Thank you for taking time to see me, Dr. Williamson." Ramsey tried to smile pleasantly. Two weeks of work down the pipes. "Have a good conference."

"I intend to," she said cheerfully. "I'll send you a postcard."

Ramsey walked out and shut the door behind him. Damn, but she'd laid it on him good. He shook his head in dismay. Still, he couldn't help thinking about how she'd looked today. She certainly was one roxy fox! And cool as well. Cooler than a cryostat. Now, if she ever warmed up toward him, even a little But that wasn't about to happen. Better get back to thinking about what to do next.

He knew damn well his data was right. Wasn't it? He flipped quickly through his lab notebook. As he'd thought, he had carefully degaussed the magnetometer, checked for residual magnetism, and recorded it carefully in the notebook.

Maybe the magnetometer itself was faulty? Ramsey walked back deep in thought. Susan sipped her coffee slowly and looked across at him. "Your main difficulty comes in subtracting out the Earth's magnetic field?"

"Yeah," said Ramsey. "My results don't agree with what everybody else gets. "

"Can I see?"

"Why not?" Ramsey handed her the stack of hardcopy. She paged through it silently, sipping her coffee. She stopped at a map of Italy. Superimposed on the map in deep red were a series of concentric circles.

"Very pretty," she commented. "I tell you what. I'll be passing over that area Thursday. If I see any giant red circles painted on the ground, I'll be sure to give you a call."

"Huh? You're going to Italy'?"

"Yep. "

.. Whys"

"Just passing through." She smiled, and her eyes glowed. "I'm going to Venus."

—
"Venus?" he said in surprise. "How come?"

"I've pretty much done all I can here," she- said. "I'm studying the Earth elemental-the magical force incarnate in the core of a planet. Very little is actually known about it. It normally takes an earthquake or a volcano to manifest it with any power. It's hard to get permission to create earthquakes, even small ones, though."

"You actually create earthquakes?"

"Well, tiny ones, anyway. Not big enough to measure without extremely sensitive equipment, but big enough to manifest the elemental."

"So how come you're going to Venus, if you're studying the Earth?"

"Hans and I think that we could learn a lot more about the nature of the

elemental by invoking the elemental of another planet for comparison. He's managed to talk the NSF out of enough funds to send me to Venus to try it."

"But isn't it rather dangerous?"

"Manifesting the elemental'? Yes, I suppose it is, but I've been working with it for years, and there are a lot of controls built in. Actually, it's pretty well confined to the Earth's core. I don't expect any trouble."

"No, no-I mean Venus. Isn't Venus rather dangerous?"

She laughed. "You've been watching too many drama tapes. Venus is about as safe as Earth. Maybe safer. Same technology as your little snow-spell, but a whole lot more reliable, keeps the heat and atmosphere out."

"My only real worry is that I might accidentally forget the rules against incidental magic and get myself booted out. "

"Rules?"

"Venus base has very strict laws forbidding any use of 'incidental' magic. Lighting cigarettes; untying knots, that sort of thing. It's a sensible enough rule. It's the ward spells that keep the whole place from being uninhabitable, so it's understandable that they'd be a bit picky about anything that could conceivably result in an accidental cancellation of a key spell. But I'll miss being able to play."

She snapped her fingers. A tiny ball of pink fire popped out of the air and settled in her palm. "All us thaumaturges like to play with spells."

She tossed the ball of fire to her other hand and grinned wickedly. "But wanton magicing is a bad habit to get into. After all, if too many people start playing with magic without the strict safeguards built into commercial spells, the

side effects could add up, and who knows what could happen'?" She snapped her fingers once again. The tiny fireball flashed blue, then vanished with a pop.

"You mean, like, if I made my snow spell wrong it could cause an earthquake in Katmandu?" asked Ramsey.

"A snowstorm more likely, unless you've got a pretty unusual snow ward. For an earthquake you'd need to awaken the earth elemental. That's my job."

Walking to the lab after lunch, Ramsey heard a low roar. As he approached, it got louder.

Now he could hear a voice, barely audible above the roar. Susan? It sounded like she was in trouble.

He ran to her lab. Unlocked. He shoved the door open, and a spray of water rushed out at him.

Inside was chaos. He looked down into the lab. Susan stood in front of a computer terminal, waist deep in swirling brown water. Her hands flew about frantically as she intoned a rapid series of spells. In front of her, a fountain of water gushed out of midair two meters off the floor. Arranged in a circle around this strange waterfall burned six candles in arcanelly carved copper stands.

Ramsey ran down the steps and waded into the room.

"Susan! What's going on?"

She looked up. "Ramsey! Thank God! I've got a runaway! If the water rises up and puts out the candles, we're in big trouble!"

The candleholders were already submerged. The water level was about ten centimeters below the flames, rising slowly.

"What can I do?"

"I don't dare move. Find some way to stop the flow! But for God's sake, don't put out any of the candles!"

"How do I stop it?"

"I don't know! Figure something out!" She went back to chanting.

Ramsey grabbed a book, waded over to the fountain, and pressed it against the stream of water. Water spurted around the edges unimpeded. He pressed harder. The book passed right through the source of the waterfall. Ramsey, unprepared for the sudden loss of resistance, nearly fell on his face.

This wouldn't work. He needed another approach.

A fire extinguisher caught his eye. Good against fire, not water. Or was it?

He grabbed it off the wall and tried it. Yes; the right type. He aimed it at the fountain and blasted. The frigid blast froze the water where it struck, but the torrent rushed the ice away as fast as it formed. No good. He walked around the fountain, looking for a weak spot. The water was now about three centimeters from the candle flames. Susan had paused in her chanting and was watching him.

From the back, he could see that the water came from a one-centimeter hole suspended in midair. If he could block it, the flow would stop. He tried the extinguisher. By directing the cold blast around the edges of the hole, he found he could create a ring of ice, hanging in the air, through which the torrent passed. But the hole wouldn't freeze closed; the Water was moving too fast.

Holding the extinguisher on the hole with his left hand, he rummaged through his pockets with his right hand until he found a coin of the right size. He pulled

it out of his pocket and carefully placed it up against the ring of ice from the back. The water pressure pushed it up against the ring and held it. He used a blast from the fire extinguisher to freeze it into place.

The torrent stopped.

"Great!" said Susan. "Hold it there while I reverse the invocation." She tapped something into the qwerty behind her and then made a gesture. The water started to drain. "Okay, now extinguish the candles."

When Ramsey blew out the last candle there was a soft pop. The ice-coated coin fell into the water. He walked over and passed his hand through where it had been. Nothing there.

Somewhere later they sat in the coffee lounge sipping hot chocolate. "You were quite the sorcerer's apprentice today," Ramsey commented. "What was going on back there, anyway?"

"I don't know exactly," replied Susan, "but I can guess. That lab is also used for Kirschmeyer's intermediate thaumaturgy course. I think one of the students set up to summon the air elemental and screwed up. Instead of calling air, he somehow got the water elemental. Rather than abort the summons, he panicked and ran. He must have left a latent connection with the nearest large body of water: Lake Michigan.

"I should have done a latency check, before I started work. I was in a hurry, though-not much time left before I leave-and skipped it. So when I invoked the earth elemental, I inadvertently opened the portal at the same time.

"That's about it. The portal was within the pentacle I'd made for the earth elemental; so I couldn't dismiss the earth elemental until it was closed. I couldn't close it until there was nothing flowing through it. And I couldn't leave my own pentacle, or I'd lose my control of the earth elemental. So I was stuck. "

"What would have happened if I hadn't come along? Kept on gushing until it drained the lake?"

"Oh, no. After an hour or so the portal would have phased out. By that time the water would have made quite a mess, though."

"Oh," said Ramsey. "So there wasn't ever any real danger?"

"No," said Susan. "Actually, the water elemental is pretty tame. That's about as far out of control as I've ever seen it. The one I'm working with-the Earth elemental-is quite a bit more powerful. In fact, if it were ever fully summoned it would be rather awesome. Since its power is concentrated at the center of the earth, though, it's pretty hard to awaken fully. The research I do invokes its presence without really fully awakening it. Tickling the toes of the sleeping giant, so to speak."

"That's not dangerous?"

"Not really. Remember, the center of power is seven thousand kilometers away. Here at the surface the earth elemental is pretty weak. It would be different

if we were near a power locus, like an active volcano or an earthquake zone." "I see," said Ramsey. "Tell me, what exactly is an elemental? It's something you've talked about, but I don't really know just what it is. Something to do with Earth, Air, Fire, and Water; right?"

"Something like that," she said. "Any sufficiently complex ensemble of symbolically interrelated objects, when interacting with a symbol manipulating object, such as a man or a large computer, will exhibit no stochastic behavior-"

"Thanks a lot," Ramsey interjected. "How 'bout doing it in English?"

"Sorry," she said. "Let's see. Inanimate objects sometimes react to magic as if they had intelligence of their own. No, that's not quite right . . . call it volition. 'hey react as if they had a will of their own."

"Sure," said Ramsey. "That's just Murphy's law. I used to have a '34 Sparrowhawk that damn sure had a mind of its own, I'll tell you."

"Well, that's partly it. In general, this only applies to really large systems, though. Things much more complicated than a car. The ocean, the atmosphere .~. . the earth. In terms of thaumaturgy, we can deal with these almost as if they were separate, quasi-sentient entities.

"Whenever thaumaturgy is done on such complex systems, portions of the system you don't intend to disturb are still necessarily affected by the magic. This excess power-call it the side effect if you want-is free to be manipulated by the `volition' of the entity, which we call an `elemental.' "

"So an elemental isn't something that's already there. It's something you create when you do magic."

"Not really. The elemental is inherent to start with in any complex system. But until that system is acted on by symbol manipulation-magic-the elemental is constrained to obey statistical laws. The use of magic can remove these constraints, and thus unleash the elemental. "

"Oh," said Ramsey. "So what do you do? Talk with it? What's it good for?"

"You can't really talk with an elemental. It has no true intelligence. At least not as we know it. You can communicate with it somewhat, using a symbolic meta-language. Aside from studying the elemental for research, like I'm doing, there's several things that elemental magic is practical for. For one thing, it's very useful for power control. An elemental has direct, fine control over huge amounts of power. The energy has to be already there; the elemental just gives you the control'."

"I see," said Ramsey. "Kind of like a light switch."

"Right. Or a detonator."

Over the next couple of days Ramsey recalibrated all his equipment, changed his instruments, took readings at every time of day, and tried every trick he knew to eliminate any noise in his readings. Finally convinced his data was right, he set out to map the disturbed region in detail.

"Need help?" Susan's voice drifted in from the open door.

"Oh, hi, Susan," Ramsey said. He was perched precariously on top of a stepladder, positioning little probes over a four-meter plastic sphere representing the earth. "Yeah. Watch the display screen and shout whenever the position marker goes over a hundred. That way I can focus all my attention on the vernier."

"Sure thing."

After a while the readings stopped. "There! Now let's take a look at what we've got." Ramsey got down, walked over to the terminal, and called up a plot.

"Hey, best data I've got in a long time. Wanna stay on and be my assistant?"

"Love to," said Susan. " 'Long as you work fast. I'm leaving tomorrow morning."

"You're leaving tomorrow? But I thought you weren't leaving until-" He stopped and thought for a moment. "Could it be Wednesday already?" "Huh! It doesn't seem like so much time has

gone by!" _

"No, it doesn't," she said in a small voice. She hesitated and started to say something, stopped and looked at him for a moment, then glanced away quickly. "So what does this new data show, anyway?" she asked.

Ramsey looked it over. "The anomaly has localized and grown somewhat more intense." He walked over to the screen and touched a control. A map of the world superimposed itself on the data. "Just south of Rome."

"What's this?" Susan asked, pointing to a squiggle at the bottom of the screen. "Looks almost like the signature of the Earth elemental."

"There's a quick modulation superimposed on the steady anomaly field." Ramsey touched the screen and a scale appeared on the axis.

"Well, how 'bout that!" she said. "It is the characteristic of the Earth elemental. Wonder why you should pick

that up'? You wouldn't believe the sort of things we do to get that clean a signal. Some people just have all the luck."

"Luck!" said Ramsey. "What luck'? How do I get rid of the damn thing'.'"

"Well, it's not coming from my lab. I haven't manifested the elemental since the day we had that problem with the water elemental. Why don't you ask Kirschmeyer? I'd bet that either he's running something that's interfering with you or else he knows who is. Can't think what it might be, though.

"Anyway, gotta go. I have a ton of stuff I got to take care of by tomorrow, or else. You take care of yourself now, okay'?"

Before Ramsey could reply, Susan ran up to him, stood on her tip-toes, put her arms around him, and gave him a quick kiss. Then she turned and ran out of the room. Ramsey stood there startled for a moment, staring at the open door.

"But how do I get this elemental out of my system?" he called after her.

"You have problems, see Hans," came the faint reply.

Giuseppe looked out in amazement at the vineyard behind his house. Grapes as big as a man's fist! Who had ever heard of such a thing? He pulled out the amulet and looked at it dubiously. He had *la paura*, the feeling of something bad about to happen. But what person stops just when things start to go well? He shook his head and once more began to make the now-familiar set of gestures. As he started the chant, he could feel the power begin to draw itself about him.

Away in the distance, a plume of steam ascended from the mountain into Elemental

the clear blue sky. Just as it had done on afternoons like this for thousands of years.

Late Wednesday night, Ramsey was still trying to pinpoint his problem. About midnight he ran into Susan outside her office. "Susan! You're still here? I thought you left hours ago."

"I should have. Just one more thing to finish off before I leave. You ready for a break? Want to get some coffee?"

"Sure."

Over at the coffee lounge, Ramsey asked about something Susan had mentioned earlier. "The reason the ancients never got their magic technology to work is that they never learned that most spells change with time'?"

"Partly. So on the rare occasions somebody wrote down a working spell sequence, in a decade or so it would be useless anyway. The so-called 'magicians' back then were pretty secretive about what they did. They didn't write down very much. Also, even when they learned that a spell sequence had changed, they had no method to figure out what it changed to."

"How's that done now?"

"You can get good approximations by analytic methods. To get a spell exactly, we do an exhaustive computer search. We just have the computer try out every possible variation on the initial approximation until we get the answer. "

"You mean computers can do magic?"

"Mais oui. Of course. Magic is just a form of mathematics. Anything that can manipulate symbols can do magic." She looked down at her coffee. Cold.

She muttered a spell and snapped her fingers. "Want yours warmed up too?"

"Warmed up? It's just barely cooled down enough to drink," he said. "So if they had computers in medieval times, all the would-be witches and sorcerers would have been able to do real magic?"

"Unlikely. They had a lot of other misconceptions, too. One or two might have lucked onto a spell that worked, but mostly they didn't go about it in the right way. First, they expected their spells to make sense. They thought the symbols used in thaumaturgy should mean something in English, or at least in Latin or Sanskrit or something.

"Second, a whole lot of what they tried to use magic for back in the middle ages simply can't be done by thaumaturgy. Turning lead into gold, coal into diamond; that's easy. We do that routinely. But things like eternal youth, or love potions, those you can't easily do using magic. Biological systems are just too complex. For that sort of stuff you need a biochemist, not a magician."

"You don't say. Know any who can get me some of that elixir of eternal youth?"

"'Fraid not. I know a few who are working on it."

"Figures. How about a good love potion, then?"

"That can be arranged. But what would you need a love potion for, though?" She looked at him coyly.

He missed her look, or else ignored it. "Oh . . . I'm sure I could find some use for one."

"It turns out that you can't actually make a love potion. Love isn't something you can turn on and off." She sighed. "Unfortunately."

She looked up at him. "But sex, now . . . that's something simple, and relatively well understood."

Ramsey laughed. "Well understood? It darn well ought to be, considering all the time people spend thinking about it."

"Oh, Ramsey, you're impossible," she said. "Won't you let me keep any dignity at all?"

Ramsey laughed: "Sorry," he said. He walked over and cradled her face in his palms. Then he kissed her.

"That's more like it," she said.

2. Susan

When Layr came on shift he immediately felt something was wrong. The violet glow from the transfer pentacle lit the room almost brighter than the fluorescent lights, too bright to look at directly. He looked at the total power indicator. One hundred eighty percent of nominal power. He'd never seen it so high.

Carlo came in a moment later. "Something's wrong, sir," he said immediately.

Layr's opinion of the boy went up measurably. "I know. Do you know the shutdown procedure?"

"Of course."

The spaceport launch system perfectly exemplified the synthesis of the old technology with the new. Antimatter power source held in check with thaumaturgical wards; computer-generated spells regulating the fire elemental that controls power flow to the bank of positronium lasers that boost the shuttles; the whole complex located at a thaumaturgical nexus to enhance the effectiveness. Simple enough in concept, although rather complicated in the actual working details. What could be going wrong?

"Drop her down to standby level."

Layr walked over to a control phone, picked it up, and pressed a button.

"This is power control. We've got a possible malfunction; we're going offline until we can do some diagnostics. No, I don't know what it is yet or if it's going to be serious. I can't say how long. Better cancel all lift-offs for today. I'll call if it looks like there'll be any danger to the spaceport. So far we're just being cautious. Right. Will do. With any luck, we'll be back on line tomorrow morning. Hold tight. 'Bye."

He put down the phone and walked over to Carlo. "Well, my friend, it looks like we've got a job to do today."

Much later, the sun was just beginning to peep into Ramsey's apartment when Susan slipped out from under Ramsey's arm and began quietly to put on her clothes.

"I'm sorry, my love," she whispered, kissing him lightly on the forehead. "I wish we could have had more time. Adieu, mon amour, et au revoir."

When Ramsey awoke, she was long gone.

Three hundred miles off the coast of New Zealand, a small group of puzzled geologists tried to determine why the cone of Manatla had recently and unexpectedly gone dead. Manatla was the newest of a chain of tiny volcanic islets on the edge of the Pacific ring of fire; it had sprouted out of the ocean floor in a burst of flame and soot in the summer of 2053.

Its arrival had been predicted well in advance; and it was not expected to stop erupting until well after 2100. The failure of the tiny volcano was an unexpected surprise.

Of course, the geologists were looking for the problem on the wrong side of the world entirely, but that was not at all obvious. Not yet.

Susan arrived in Naples tired, but too excited to sleep. The Venus ship left the next morning from the Napoli spaceport. The NSF had provided a room at the spaceport Hilton for the night. She tried to read, but somehow couldn't concentrate on the screen. She found a sliding door opening onto a tiny balcony and went outside.

Looming out of the cloudy night was the immense bulk of the mountain Vesuvius. The European spaceport had been built practically atop it, she recalled, because the presence of the volcano made the spot a thaumaturgical nexus. This made it easier to control the fire-elemental spells used to boost spacecraft. The volcano would also make this a dandy place to invoke the earth elemental, she thought. But dangerous. She remembered how she had told Ramsey about the indiscriminate use of magic. Should she call him? What could she possibly say to him, after last night?

Instead she undressed and went to bed, dreaming inchoate fantasies about earth and fire, volcanoes, spaceships, and pentacles.

She was awakened at ten by a call from the spaceport. Her Venus flight had been postponed a day due to some unspecified problem with the launch system. They were terribly sorry. (In the interim, her hotel room and meals would be paid by the space line, and if she chose to amuse herself by taking any of the many tours and day-trips offered by the hotel-she thanked them and hung up.

She did not care to amuse herself with tours and excursions, but found she couldn't get back to sleep. She thought about calling Ramsey. Instead she called Kirschmeyer's office. He wasn't in. What time was it back in Chicago, anyway? Oh . . . five A.M. No wonder nobody was there.

She ended up spending the day lounging around the hotel pool, sunbathing and organizing her notes on Earth elemental, working out some ideas to put into action when she got to Venus.

At five in the evening she got another call from the spaceport. The Venus flight was postponed again . . . she'd half-expected it. She went over to the tours desk to look for a tour to the Vesuvius crater. None on Saturday. Since she couldn't see Vesuvius itself, she settled on a tour to see the cities it had buried, Pompeii and Herculaneum.

Without thinking about what she was doing she punched out Ramsey's number. She held her breath as she waited for an answer. When there was no answer after fifteen rings, she didn't know whether to be relieved or annoyed. Kirschmeyer wasn't in either. She left a message with the prof's computer telling that the flight had been delayed, then went back to the pool and read the brochures on Vesuvius.

Although technically dormant rather than extinct, she read, geologists had determined that the volcano would not be likely to be active for several centuries at the very least. In the meantime, tourists climbed its slopes and marveled at the occasional puffs of steam emitted from crevices in the crater, while below, farmers grew olives

and grapes on the fertile low slopes of the mountain.

She spent the rest of the evening on the balcony, watching the volcano and daydreaming. By daylight, the crown of Vesuvius was covered by an immense plume of steam. As the sun set, this turned a vivid orange. Even in full darkness, the base of the plume remained faintly luminous, as if lit from below by unseen fires.

Professor Kirschmeyer had Ramsey's hardcopy spread across the floor of his office. He knelt over it, studying intently. A trail of colored chalk dust showed which sheets had been examined. Ramsey looked on from a more dignified position, sitting on Kirschmeyer's desk. After a while, the professor stood up. He pointed at one of the papers with the stem of his pipe.

"Well, mine friend, here we see a steady base of the elemental presence. It flares up to a higher level from time to time, but these occasional flare-ups stopped suddenly, at about the same time my Susie left us. Other than the fact that this very definitely is the signature of the Earth elemental, I can see no connection to my work. I wish Susie were here-she might have some ideas. Me, I'm lost."

"If it's not interference from your work, why did it stop when she left?"

"Coincidence. Something else must have stopped, or started, at about the same time."

"Like what?"

"If I knew that, my boy, most certainly I would tell you, and we'd have the problem solved."

"So what do I do now?"

"Next we all go home and get some sleep and think it all over. In the morning I meet you in your lab, ja? and maybe we have some better ideas then."

"Right."

As Ramsey and Kirschmeyer left the office, the 'incoming' call light on the terminal started flashing. Kirschmeyer reached out and flicked the switch over to 'not receiving.'

"Shouldn't you answer that? What if it's important?"

"I rather doubt it. Besides, I have a reputation to keep up. I answer too many of my calls and people might think I have nothing better to do, no? If it's important, let them leave a message with the computer."

In Rome it was almost morning. When the conference on interstellar winds ended, Dr. Williamson had intended to spend the weekend in Rome with Count Raminski, but he had unexpectedly taken ill. Might as well see something of Italy, she thought. It's been ages since I've been here.

She wandered into the Sheraton lobby and gathered a handful of pamphlets advertising tours and attractions of Roma and vicinity. One with a picture of a flaming volcano on the cover caught her eye. "Pompeii: a City of Entombed." The drive from Rome to Naples was beautiful but hair-rising, even in her little sportster, which was both smaller and more maneuverable than most of the vehicles she passed. The Italian

drivers more than made up for the difference by the gusto with which they drove, bordering somewhere between hysterical and insane. South of Naples the road to Pompeii snaked along volcanic cliffs at the edge of the brilliant blue sea. Far below she could see sheltered coves and fishing villages, along with occasional empty beaches of brilliant white sand.

Even on the twisting mountain roads the drivers raced with insane verve. All she could do was hope that when one of them finally managed to push her off the narrow road, she could eject before the car started tumbling. It was a long way down.

Somewhere between Naples and Pompeii the skies changed from the oppressive gray clouds of the city into a brilliant sunshine.

"First, make a list, in order of correlation, of all activities or natural phenomena occurring within one hundred kilos of the campus which match the timing of the activity in your data," said Kirschmeyer.

"Right." Ramsey turned to the qwerty, started typing, paused for a second, then typed fast. The viewscreen across from them lit up with a list. Both of

them studied it.

"Not much significance, is there?"

"Nein. Phone calls to Iceland; purchase of medical textbooks . . . look hard enough and you'll find seeming correlations in any large enough set of random events." He looked over at his pipe. "Tiburanaal." The pipe lit with a blue spark. He picked it up and puffed thoughtfully. "Let's try another approach. Your anomaly centers around Rome?"

"Closer to Naples."

"Okay. Try a correlation to activities there. "

"Data bank won't be as complete."

"Can you hook an Italian data bank?"

"I can try." He started typing.

"Got it," he said after a moment. The screen blanked and then lit up with a shorter list.

"Jackpot! There's our correlation: launches from Napoli spaceport."

"Stimmt. Right enough. It accounts exactly for the sporadic signal, even for the stopping thirty hours ago." Kirschmeyer paused and looked at Ramsey.

"Ramsey? Why did the spaceport stop launching thirty hours ago'?"

Ramsey typed the question into the computer. - 'Unscheduled maintenance,' prof. Beats me why."

Professor Kirschmeyer looked up. "Ramsey, my friend, I am beginning to get frightened."

"Why? Looks like I'm just picking up interference whenever they launch a shot from Naples. Probably an electromagnetic pulse that just happens to resonate my detector."

"Ah, my friend, I wish I had as little imagination as you. We still can't account for why noise shows up as the signature of the elemental. Do me a favor? Call up a plot of your magnetic anomaly, centered over a map of the spaceport."

Ramsey did so. "Huh! Look at that. It's not even close to exactly centered on the spaceport." He typed another command. "Center is . . . 23 kilometers off, bearing 342 degrees. Another

map . . . got it. It's centered on a frigging mountain. Vesuvius."

"As should have been obvious to me as soon as we agreed that it was indeed the earth elemental we saw, not some random noise signal. Ramsey, a signal that strong only could come from an earthquake or an active volcano."

"Active'? Isn't Mount Vesuvius extinct?"

"Dormant, my friend, only dormant. Sleeping. But I don't think it will stay asleep for long."

"You think it's about to erupt'?"

"Yes. Ramsey, this data makes sense only if the Earth elemental has left the center of the Earth and is rising slowly toward Italy, dragging a portion of the Earth's magnetic field with it. Somehow, by someone, it's been summoned. Not merely manifested, like we do here for to study it, but fully awakened and called. Of course, I can't say for certain, but I can't see any other way to interpret this. "

"Then we gotta do something. Stop it! Warn people!"

Professor Kirschmeyer put his hand on Ramsey's shoulder. "Hold on a moment, my young friend. Let's get some better data before we start rushing around like fools, eh? Who stirs up a hornet's nest had best be prepared for the stings.

"First, we can connect up your magnetometer to one of my spells invoking the elemental, which will give it a lot better sensitivity for this application. Next, activity on the part of the Earth elemental will be mirrored in the other elementals, particularly ocean and fire. We can set up some kind of monitor on that. Also, it should be possible to triangulate on the Earth elemental using your technique. Then we can find out for sure whether the elemental is actually surfacing."

"How much time do we have? Shouldn't we get a warning out as soon as possible?"

"That's the first thing we need to find out. I'm hoping we can figure that out

when we triangulate. The elemental is rising from the core toward Vesuvius; we need to know how deep it is and how fast it's moving. Until we can give a definite time and estimate how bad the eruption will be, it's worse than useless to try to make anyone heed a warning. If they evacuate prematurely on the basis of a quick guess, people will come back to their homes after a day or so when they see nothing happening. Then when the real warning comes, they'll ignore it. We'd do more harm than good. "

"So let's get to work!"

"Doch, doch, we shall. I just wish . . . I wish we had Susan here. This is really her field, not mine."

"Not your field? Aren't you her advisor'?"

"Oh, yes, her advisor I am. But Susie's work is really pioneering. There are very few people who understand the Earth elemental, and I don't doubt that Susie's the best of them. Certainly she has the 'feel' for it. Myself, I can work with it when I need to. My real skill, though, is with the water elementals ocean, lake, rivers, that sort of thing.

"But our Earth elemental expert is merrily on her way to Venus, so I guess we'll just have to muddle through the best we can."

"No," said Ramsey. "I don't think she is on her way to Venus. She couldn't be. "

"Do you know something I don't know? She left two days ago."

"No she didn't. The spaceport's shut down, remember? No flights."

"That's right. So she must be stuck in Naples. But wait . . . if she didn't leave, I know she would have called me. "

"Maybe she did. You don't answer your calls, right'?"

"Stimmt. Right. She would have left a message with the computer. And I didn't check my office this morning. Let's go. No, you stay here and start programming. I'll go up and see if there's a message from Susie. No, better yet, you go up and see if there's a message, I'll stay here and start working-'

Kirschmeyer turned around. "Ramsey?"

But Ramsey was already gone.

Pompeii was tranquil and peaceful. Susan had expected to see a blasted ruin of rock and volcanic ash, but instead she found a sunny clearing in the midst of fields of olive trees and vineyards.. The tour guide went on to take the group past varied excavations and ruins. Susan quietly slipped away from the horde of would-be guides, souvenir sellers, and vendors of 'authentic' relics surrounding the group and found a low stone wall overlooking the site to sit on and contemplate.

Up the dirt road in front of her zipped a sportscar, a sleek late-model Tigershark, gold with black trim stripes and a tinted canopy. As it came by her it abruptly slowed and skewed around in a cloud of dust. The fans revved down

and the car settled to the ground. When the canopy popped open, Susan was surprised to recognize Ramsey's advisor, Doctor Williamson.

"Excuse me," said Doctor Williamson. "Don't I know you?"

"Susan Robinette. Yes, I work for Hans Kirschmeyer, down the hall."

"Oh, yes, of course. You're the one Hans always talks about, doing the work with the elemental. How unusual to run into you so far from home! But, of course, you must be on your way to Venus. Right?"

"Right," said Susan. "The flight was delayed; I'm killing time until it gets rescheduled."

"What a nuisance. You know, sometimes I think I've spent half my life in airports, and spaceports, waiting for flights, waiting for people to arrive, waiting for people to pick me up. I'd give up traveling entirely, if it weren't the only way to get from here to there."

"You travel a lot, Doctor Williamson? To conferences and such, I suppose."

"Please, call me Jane. No, I was traveling long before I ever got invited to conferences. My parents were both diplomats, you know. When I grew up, I hardly knew which continent to call home, much less which country."

"That sounds so wonderful," said Susan wistfully. "I never went even a hundred kilos from home until I left for school in Ontario."

"You're from Quebec, I take it'?"

Susan pouted. "Is my accent still that obvious? Yes, I'm from Saint Andre. It's well north of Montreal, on Lac St. Jean."

"Ah, yes. Beautiful country, that."

Well, I can tell you that growing up in hotels and embassies around the world may sound fabulous, but the reality is quite the opposite, I assure you. For one thing, I never had any friends my own age. Just about the time I started making friends somewhere, we'd move, or I'd be sent off to live with my father on another continent, or something.

"Your parents were divorced'?"

"Oh, no!" Jane laughed. "But they did hardly ever see one another. Except at occasional diplomatic balls and suchlike. I think they really did love each other, in their own way. You had to be very close to them to be able to tell, though."

"That seems so different from my family," Susan said. "I grew up on a farm; my parents hardly ever got out of sight of each other."

"How did you end up doing thaumaturgy?"

"In high school we had a physics teacher who knew a little thaumaturgy as well. He used to do demonstrations in class. I'd stay after school and help him set them up. I guess I was just naturally good at it. I knew as soon as I tried it that it was what I wanted to do with my life."

"Your parents must have been very pleased."

"My parents were furious. They thought that magic was no fit occupation for a girl; I should learn tractor repair or something practical I could use around the farm. So I could become a good farmer's wife. And if I hadn't won a scholarship to Waterloo that's all I ever would have been."

"You say you never had any friends your own age. Well, you weren't missing much. It's hard not to know people in such a small town, but there isn't anybody worth knowing."

Jane smiled. "You think you had it rough. My parents didn't ordinarily pay very much attention to me, but when I was sixteen, it somehow dawned on my mother that I didn't have any boyfriends. So my parents somehow got together and arranged a big debutante party for me at my uncle's mansion in New Canaan. A big, high society affair; people flying in from all over the world. They had a lot of fun planning it; they discussed it for months. They never bothered to ask me, of course. I was terrified. When the big day finally came, I couldn't do it." She giggled at the memory. "I couldn't face it. So I ran away. Hitchhiked right across the country in my formal. This big coming-out party, people arriving from all over, and the star attraction didn't even show up. It was talked about for just ages."

Jane threw back her head and laughed. After a moment, Susan joined in.

"So what happened when you finally returned home?"

"But I never did. I worked in San Francisco over the summer, and in the fall I enrolled in Berkeley. I was too frightened to go back, you see. It's all rather funny now, of course."

"Still, it's all made you into a very cosmopolitan woman."

"Yes, I suppose it has. If you think that's worth the price."

"Ramsey is in love with you, you know. "

"Ramsey Washington? Yes, I know," Jane said. "He doesn't think I know it though. How well do you know Ramsey?"

"Pretty well, Not well enough, I guess. "

Jane looked very hard at Susan. "You're in love with him?"

"Very much. '."

"Oh. I see." She sighed. "There's very little I can do about his infatuation with me, you know. All I can do is avoid encouraging him as much as possible without actually being rude to him or hurting him too much. But he'll have to grow out of it himself."

"I know. It just seems so unfair, somehow."

"The world isn't fair, dear. We just have to live with it the way it is." Jane stood up. "Anyway, we're both here thousands of miles from home, we might as well see a bit of it. Shall we?"

3. Elemental

Layr put his wrench down and looked at Carlo. "We're in deep trouble," he said.

"I know."

Fifty hours after the power control had been put into automatic shutdown mode, the power meters still read a hundred and thirty percent. What was ` more frightening, though, was that the needles had stopped showing a decrease and were now very slowly inching back up.

"What bothers me most," said Layr, "is not that the control isn't working. It's that I don't have the slightest idea why. I can think of only one thing left to try. "

"Questioning the fire elemental?"

"Yeah."

"This is a dangerous place to summon fire."

"I know it. Have any other ideas?"

"No."

"Then we'll just have to be very careful. Make a subsidiary pentacle for yourself and be prepared to take over if I'm overpowered."

"Right."

Layr walked over to the main terminal and tapped in a sequence of requests. Two projectors near the ceiling lit up, projecting three unusually complex pentacles onto the floor. Carlo knelt down and began to outline them in paint in case of power failure. Meanwhile Layr called up a review of the spell sequence required and checked it against his own dog-eared manual.

"Sir'? Are you planning to have the computer do the invocation, or are you going to do the invocation yourself'?"

"Doing it myself."

"Might be better to have the computer do the summons; leave you free to concentrate on contingencies."

"I thought about it. Under the circumstances, I'd rather have the invocation directly under my control. I'd like to be able to switch spells fast if there's any trouble. If I'm harmed, well, that's what you're here for."

"Thanks. "

"The antimatter's protected by its own pentacles. I don't anticipate anything threatening it; it should be safe even if the back blast wipes out the whole rest of the spaceport, God forbid. If something does happen to me, though, maintaining the integrity of the confinement pentacle is your number one priority. "

"Right."

Layr looked over at Carlo, who had finished outlining the pentacles and was now cleaning the brushes. "Give it an

other five minutes for the paint to set, then light the candles." He walked over to the control console and picked up the phone.

"Control, this is power. We're ready to summon the fire elemental, at minus five minutes, mark. This should be routine, but I suggest you have your people sheltered just in case." He put down the phone. "Wish I felt as confident as I sound. "

Layr positioned himself in the center of one of the smaller pentacles. Carlo lit the five candles circumscribing the large pentacle, then retreated into his own pentacle. Layr looked at his watch, then at Carlo.

"Here goes."

"Diiratah kiimatahi na naratah na diir," he intoned in a smooth cadence.

"Kiimatachi, kanahatau'illannaghani. Nehobeth! Na naratah na diir. Diiratah!"

A blue glow, formed in the empty pentacle. Layr made a complicated gesture and spoke once more. The glow consolidated into an eerie violet dame.

"Sassilloe fsartha?" said the flame with a soft hiss.

Layr watched the computer screen, not the elemental. "Naal tenepah. Anada.

Tnillipa pesardathi!"

"Psillissasi," replied the elemental. "?! Ness, simi.ss kssissith Saar. ?! Simmolavah na. "

"Ness, simmassis ksaar. 'illissis."

"Ness, simallahi .sis."

Layr turned from the output screen and looked directly at the elemental. He made an abrupt gesture, the reverse of the one he'd made to summon the elemental. "Diir na hataran na ihatamiik hatariid!" He made another gesture. "Ssimiloth? Prissathi iss." The violet flame grew wider, brighter, reaching to the edges of the pentacle and seeming to push outward, as if testing the walls of an invisible prison. The candles surrounding the pentacle flickered. Layr stood motionless, watching.

"Sissarathi. "

The flame vanished with a thunderclap. It took a moment for the eyes of the two watchers to readjust to the room's light.

"I've never seen the manifestation so weak!" Layr said. "'there was hardly any power at all. Damn. We should have expected this. We're so well warded against fire that we should have known that it wasn't causing the problem.

"But what is, they'?"

"I couldn't get that. Another elemental. What's next most likely'?"

"From the amount of power involved," said Carlo slowly, "It's got to be one of the primaries. Ocean, atmosphere, biosphere . . . Earth. It's the Earth elemental. Right?"

"Yeah. That's the way I figure it, too."

"But the Earth elemental is supposed to be the most stable of all."

"Yeah. And the hardest to control. Somehow it must have been awakened: But by whom?"

"I repeat, this is an emergency. It is absolutely essential that she get in touch with me. Make every effort to have her found. Thanks!" Kirschmeyer hit the kill button on his console and turned to Ramsey.

"No luck. The tour bus returned from

Pompeii half an hour ago, and she wasn't on it. She's not in her hotel; she's not at the spaceport. I'm having the police watch for her. In case she comes back to her hotel room, I left a message for her with the computer there. What else can I do'?"

"How long before we get the data to triangulate the elemental'?"

"Rosenblum promised to call with the data, in," he looked at the screen, "exactly forty-five minutes."

"Then t see only one thing left for us to do," said Ramsey.

"What's that?"

"Get some breakfast."

"Good idea. First we breakfast. Then we panic."

"Jane! Stop the car! Quick!"

Doctor Williamson slammed on the drag skids. The car skewed around in a cloud of dust.

"What's wrong?"

"Those farmers. Hold do here a sec, huh? I want to watch what they're doing."

- .

Jane killed the lift fans and looked out across the field to where Susan had pointed. In the distance, two men stood by a tractor, facing the sun and waving their arms in a complicated pattern. Jane recognized the sight of people casting a spell. What was so unusual about that'?

"What-"

"Quiet!" whispered Susan, gesturing, with her left hand. "Maybe I can hear what they're saying."

Now that the fans had revved down, Jane could barely hear the words coming from across the field. They made no sense to her. She reached across into the glove compartment, got a pair of field glasses from under the seat, and handed them to Susan without comment.

"Huh? Oh, thanks." Susan grabbed the glasses and peered out across the field.

"Merle. Just what I thought I saw. I'd recognize those gestures a mile away. They're invoking the Earth elemental!"

`So?'

"Jane, that's an active volcano over there. The only reason I can think of to invoke the Earth elemental at this particular spot would be if you wanted to commit a particularly spectacular form of suicide! Just what the hell do they think they're doing?"

"Let's ask. Climb back in." Jane shoved the lift fans into high, and the car bobbed into the air. "Hold tight." She twisted the wheel and gunned it. The car shot off the edge of the road, jumped across the roadside ditch, and skittered across the field.

"I don't expect they'd speak English," Susan said doubtfully.

Jane laughed. "So what? Susan. I can't even count how many languages I know. If they don't speak English, I'll translate for you."

"I guess there is one advantage in growing up on five continents after all." The car bounded across another ditch and skidded to a halt beside the surprised farmers.

Layr completed his spell and watched the needle swing over. "Mother of God!" "What is it?"

"The Earth elemental presence should be barely detectable through all our shields. Instead it's off the scale. That's at least fifty thousand percent amplification!"

"You're summoning it?"

"Hell, no! Do I look stupid'? I can get a reading without doing a full invocation. At these insane power levels, even that could be risky. What in hell's name is going on'?"

"Sure the meter's working'?"

"Yeah. Anyway, it all fits. It explains where our excess power is coming from. We're tapping the Earth elemental via Vesuvius. But how can it be that powerful'? It's over seven thousand kilometers away!"

"Could it have moved closer?"

"Seems awfully unlikely. It would take half a dozen thaumaturges to coerce it to the surface . . . still, that would explain the readings . . . if the power level is correct, it must be, let me see . . . three hundred kilometers away? And getting closer every minute."

"What if it were a lot of untrained magicians instead of a few trained ones?"

"It would take a lot more. Hundreds. And why would they want to do it?"

"Terrorists? Maybe they want to destroy the spaceport?"

"No. Doesn't make sense. Carlo, any terrorists with the capability to summon the Earth elemental to the surface could just as easily make an antimatter bomb Holy God, the antimatter! Carlo, what's the current reading on the antimatter level?"

'`213 Kilograms, Mr. Layr."

"We're in a lot worse trouble than I thought. If the elemental really is surfacing, the volcano is going to erupt."

"Erupt? You mean like Pompeii?"

Carlo turned white. "My God! That would kill fifty thousand people!"

"A lot worse than that, Carlo. That was just an ash cloud; a natural eruption. This would be forced eruption. These days the vent of Vesuvius is pretty well plugged. It won't just erupt, Carlo. It'll explode. Like Krakatoa. But that's not the worst of it--"

Carlo was silent for a moment. "Oh, gods . . . the antimatter. The wards might not hold. Sitting on top of a volcanic explosion? They're not designed for that kind of stress. They'd overload. We'll be sitting on top of two hundred kilos of unshielded antimatter"

"Do you know how big an explosion that would make'?"

"No. I can't even imagine it. Let's see" Carlo turned to the computer.

"Total conversion, 425 kilos . . . E=MC squared . . . Ten thousand megatons. Holy mother, that's a million times bigger than Hiroshima! Why, that's . . . that's a fireball fifty kilometers across!"

"Pretty close," said Layr. "You've got to figure that only about half of the energy will be absorbed, the rest will be radiated directly into space as gammas."

"That's still pretty catastrophic," said Carlo. "Let's see, five PSI overpressure radius, 90 kilometers. Praise the gods, it won't take out Rome, at least. "

"Wrong. We're almost on the sea. The blast will raise a tidal wave, f can't begin to calculate how high. It'll splash the Mediterranean dry like a puddle stepped on by a giant. I don't think there'll be much left of Rome after the tidal wave hits it. I don't think there'll be much left of anything south of the Alps."

"What do we do?"

"Neither one of us is qualified to handle this one. We need to find someone with some experience in handling the Earth elemental. And we need to do it fast"

"Still no luck in contacting Susan?" asked Ramsey.

"No.' .

"What then?"

"According to your data, my friend, the elemental is going to surface at Vesuvius in seven hours. No way to stop that. If someone were right there when it happens, and if they had your data, and if they had enough experience with the elemental, then there would be a chance that they could calm it."

"Yeah?"

"Yeah. Maybe."

"Who has enough experience?"

"Susan. Me. Maybe four, five other people in the world. Nobody we could contact in time. Susan knows it best."

"But she's out of touch."

"Right."

"So it's gotta be us."

"Right."

"Let's hope there's a flight. We don't have any time to spare."

The gold Tigershark sped down the twisted road at almost two hundred klips. Some of the turns were rather wide; hovercars are designed for speed, not for maneuverability. When the road turned too sharply, Jane just cut across the fields, dodging between the olive trees, rather than slowing for the turn.

"I've been pretty dense," Susan

said. "It should have been obvious to me from the start. . . ."

"What?" replied Jane. "That a bunch of Italian peasants were inadvertently calling up the Earth elemental while trying to improve their crops? Why should that have been obvious?"

"I should have figured that somebody was messing with the Earth elemental.

That should have been obvious as soon as I saw Ramsey's data."

In front of them the tiny dirt road joined up with the highway. "Which way?" asked Jane.

"Vesuvius," replied Susan. The car shot to the left. "No, wait . . . first the spaceport Hilton!"

Jane slammed the stick to the side, and the car spun around backward without slowing down. Then she hit both the drag skids and the turbos at the same time. The car stopped as if it were suddenly nailed to the ground, then shot off in the opposite direction.

"I've never seen anybody drive like that before!" Susan said. "Where in hell did you pick up that trick?"

"Used to play polo for Berkeley," said Jane. "What were you saying about Ramsey's data'?"

"His data showed the signature of the Earth elemental."

"His equipment wasn't calibrated right."

"I think it was. I was just too blind to see what it meant."

"You looked at his data? You really think it was valid?"

"Absolutely."

Jane was silent for a moment. "How bad is the situation? You're sure that just getting them to stop using that spell won't be enough?"

"Quite sure. The elemental's been called; it's just taken a long time to respond. But when it gets here, all hell is going to break loose over this part of the world."

"Then it's all my fault. I was working so hard at ignoring Ramsey t went too far. I hardly even looked at his data."

"But you didn't know what to look for, and I did."

"That doesn't matter. It was my job to know what he was doing, not yours. "

The spaceport Hilton appeared suddenly on the right. Jane cut across a couple of corners and screeched to a halt in front of the door. They both jumped out of the car.

Upstairs, Susan dumped open her suitcase and started to grab out various items of magical paraphernalia.

"You've got a bunch of urgent messages waiting on the room console," Jane called back to her.

"Who from?"

"Four messages from Hans Kirschmeyer . . . One from Ramsey . . . One from the spaceport ticket office . . .One from Christian Layr. . ."

" W ho?"

"Somebody called Christian Layr . . . the message says he's the chief engineer of power control at the spaceport. He wants you to get in touch with him, as soon as possible, urgent."

Susan laughed. "I'll bet it is! Looks like somebody else has figured out what's going on!"

"Shall I call him?"

"No time! If anybody else calls, put a message in the computer saying I'm heading for Vesuvius." She grabbed a portable console from the desk and threw it on top of the stack. "Let's get out of here!"

As they reached the car, Jane asked, "How likely do you think it is you'll be able to control it?"

"I give it about a fifty-fifty chance," Susan said. "But I've got to try at least."

"Think you can handle the car?"

"Not the way you can."

"But you can drive it?"

"Sure."

"Take it then. If things are as bad as you think I'd better warn the authorities. "

"What can they do?"

"They can start evacuating the area, for one."

"You trust my judgement enough to start a full scale evacuation?"

Jane looked at her for a moment. "You seem pretty certain."

"Oh, yes, I'm pretty damn sure. Okay, go to it. If it's as bad as I think, though, you only have a few hours left. That's not enough time to get everybody out of Italy even if you could convince them to go."

"True," Jane said. "But we're morally obligated at least to give the warning. The rest is up to them."

Kirschmeyer's car was a battered BMW Landstreicher, but he drove with every bit as much verve as Doctor Williamson. He drove up onto the walkway in front of the terminal and parked.

"You're just going to leave it here?" Ramsey asked.

"Why not? So they tow it away. We've more important things to worry about, vein?"

"Right." They ran into the terminal.

"Flight 119, Naples and Spaceport Europe, boarding in ten minutes gate 99. Flight 119 to Naples, boarding in ten minutes."

"That's us," said Ramsey.

"Ja. And just enough time to try once more to get a hold of Susie," Kirschmeyer replied, heading for a public terminal.

A moment later he shouted. "Bingo!"

"You got her?"

"No! I got her computer. She left a message for us. She's figured out what's going on; she's headed for Vesuvius to try to turn it back! Good girl; she's worth the two of us put together."

"What now?"

"We still have to go there. She's out of contact again, but she needs the data and the equipment I've brought if she's going to have much of a chance of stopping it. We don't both need to go. One of us is enough. Are you sure you want to do this?"

"No way I'm staying out of the action, prof. "

"It'll be damn dangerous to be there, even with what I brought for her. Damn near impossible without."

"I'm going," Ramsey said. You're going, he thought, how could I do less?

"I can't talk you out of it?"

"No way."

Kirschmeyer clapped him heartily on the shoulder. "Good lad! I thought I could count on you! It warms my heart to know that young men are still brave and foolhardy. My Susie could have picked a lot worse for herself, ja! I wish you both the best of luck in dealing with the volcano."

Ramsey suddenly had a sinking feeling in the pit of his stomach. "You mean you're going to stay behind?"

"Only one of us is needed to get the stuff to her. With you there by her side to give her support, what use am I? All I ever knew about elementals I have taught her, and well she learned, and far more besides. She has no need of me. With you, her brave young man, there at her side, if there is any way for her to stop the volcano from blowing you both into little teeny bits, I'm sure she will find it. She will have the motivation, no?"

"But for me, I have my own work to do. I have another flight to try to catch. To New Zealand."

"New Zealand!" Ramsey said. "You're running clear to the other side of the world?"

"Ja, ja, New Zealand it is. And I must run. Give Susie my love, yes? And, absolutely, without failure, be sure to tell her where I went. Tell her she can count on me if she needs me." Kirschmeyer turned and ran.

"Coward!" Ramsey shouted after him.

"No time to explain! Ask Susie." Kirschmeyer shouted back over his shoulder, then, dodging pedestrians, disappeared into the corridor.

"Flight 119, now boarding at gate 93. Flight 719, Naples and Spaceport Europe, gate 93." Ramsey turned away from watching Kirschmeyer and walked over to board.

The prefect of Naples put down the handset with a scowl.

"Bad?" asked his chief of staff, a rather serious, hard-working young man without whom the governor would not be able to get anything done at all.

"I don't know," said the governor' slowly. "If it weren't for the coincidence, I'd probably just dismiss them as crackpots"

"What?"

"I just got two calls, from two entirely different people, both urging me to evacuate Naples and the entire surrounding countryside." "But that would be impossible! Why?"

"One of the calls was from a rather well known professor at the University Padua. A colleague at the University. Chicago, name of Kirschmeyer, informed him that data they'd collected indicated Mount Vesuvius was about to become active again, probably with a_ rather large explosion."

"Vesuvius? That's ridiculous."

"Maybe so. He said that he could personally neither confirm nor deny the prediction, but what data he could take.. showed something unusual was happening, or about to happen, on or near Vesuvius."

"He suggested you evacuate?"

"No. He said he was passing along the information, and that whether to

evacuate the area or not was a decision only I could make."

"And the other call?" ;j

"Was from a woman, an American, j also a professor at the University of Chicago. A Doctor Guenevere Williamson. Rather well known in planetary physics, you may have heard of her. She j happens to be visiting Naples. She stated that one of her students had evidence that Vesuvius was about to explode. She suggested in the strongest

possible terms that I give order to evacuate the entire area."

"But such an evacuation would be a major disaster, chief! And keep in mind that one of the things that American university students are famous for is the pulling of pranks--"

"True. It could be just a prank. But if so, one in extremely poor taste. Or it could be simply a mistake."

"You're thinking about Pompeii," Ben stated.

"No. We've lived with the memory of Vesuvius and Pompeii for many centuries. I'm thinking more about another volcano. Pelee, a mountain on the tiny French island of Martinique. It's been one of my nightmares for many years. In 1902 or so, I don't remember exactly, Pelee started to make noise and shoot out sparks. The population of Saint Pierre, at the foot of the mountain, were terrified. But the governor-general, feeling that a panic would be worse than the risk of an eruption, put out the word that nothing was wrong, that the people should go about business as usual. Later it got still worse. Ignoring the governor's orders, people began to flee the city and head for the highlands, far from the smoking mountain. To maintain order, the governor ordered the soldiers to bar the streets and to close the port, to prevent anybody from leaving."

"And?" prompted Ben.

"So the evacuation was halted, and a panic in the city prevented. Order prevailed. Forty thousand people were in the city when the mountain exploded. When rescue ships finally arrived, three days later, there was only one survivor. Only one in the whole city."

"Oh."

"That was long ago, of course, and on another continent. But, Ben, there are three million people in greater Naples. And I'm responsible for all of them. Until now, I've never regretted going into politics. I've always felt I was needed, that I could do a good job, better than--or at least as good as anybody else could do. I like to make the city run smoothly, to try and make the lives of my people a little better, a little happier.

"I can't let all that go to waste, Ben. I may make a name for myself as a foolish old man who let a rumor panic three million people. But still, I can't make any other choice.

"We'll make the evacuation as smooth and orderly as humanly possible. But, right or wrong, I'm going to evacuate the city."

3. Volcano

Carlo shut off his qwerty and turned to Layr.

"Still no luck in finding someone qualified to work with the Earth elemental, eh?" Layr asked without looking up from his own qwerty.

"Not exactly," Carlo replied wearily. "The data bank lists only seven people in the world as being qualified. One of them turns out to be here at the spaceport right now."

"Here? Who? Where at the spaceport?"

"Listed as being at the Spaceport Hilton. A Susan Robinette. I've been trying to contact her, in your name, for the last hour without success. I just got a message from her computer. She's right now on her way to Vesuvius--"

"Vesuvius? Then she's already aware of the problem!"

"Unless it's just a sightseeing trip."

"Have you looked outside? Nobody sane would go sightseeing to Vesuvius today. We'd better hope she stops the eruption. We can't worry about that, we've got to do something about the antimatter. "

"If she can stop the volcano, we don't have to worry about the antimatter."

"But maybe she can't. I've been keeping power readings on the elemental; it's powerful, unbelievably powerful. At this stage, I'm not sure there even is any way to stop it."

"What is there we can do about the antimatter? Can we invert it?"

"I wish it were just that easy."

"Why not'? It's a simple spelt. About the simplest there is. Reverse antimatter into matter; should be about as simple as turning a left shoe into a right one."

"Oh, it's a simple enough spell, all right. But there are two reasons we can't use it. You've heard of the UN Commission on Peaceful Uses of Thaumaturgy? They've set a ward spell over the entire earth to prevent matter/antimatter inversion spells from working. Can you imagine what would happen if any backyard thaumaturge decided to make some antimatter just for kicks?"

"Yeah. But couldn't we circumvent that somehow?"

"Yes, we probably could. All they can do is try to slow down amateurs; they can't stop a professional. It would take us some time, but we could do it."

"The second problem is that in order to invert our antimatter, we'd first have to take down our own wards. . . "

"Oh," said Carlo. "Of course. And to do that would initiate the very disaster we were trying to avoid. " Carlo thought for a moment. "What if we were to set up a pentacle around the whole power control? Then invert everything inside; the building, the air, the computers, even ourselves? Turn it all into antimatter. All but the antimatter, which is warded itself, so would stay unchanged. If we ourselves are antimatter, we can release the inner wards without any harm. Then we can do another inversion, and we're safe." Carlo grinned.

"Clever," said Layr. "Just one problem. What happens if the volcano goes off when we're halfway through?"

"Oh," said Carlo thoughtfully. "Then the disaster would be magnified a millionfold. "

"Right. It would split the Earth open like a clamshell. Yes, it would work, Carlo, but we don't even dare think of trying it." He stared off into the distance. "Still, it's basically a good idea. If we survive this it wouldn't be hard to rig up some sort of automatic spell to invert the antimatter in an emergency. Something like that should have been built in right at the beginning. Damn poor engineering." He looked up at Carlo. "Anyway, we have to live through this first."

"You have an idea?"

"Yes," said Layr grinning. "We're a spaceport, right? Let's act like one. I say we just lob that son of a devil clear into orbit, pentacles and all!"

"Of course. Why not?" Carlo grinned back. "It'll sure make a mess of the spaceport, though. We'll have to keep the pentacles intact; that means orbiting about half of power control with it."

"True. But it'll make even more of a mess if it goes off."

Just as the suborbital entered the atmosphere over Italy, Ramsey heard an announcement. Naples port was closed to all incoming flights. Nobody would be allowed to leave the shuttle. They would pick up as many outgoing passengers as they could and boost out immediately. Naples was being evacuated

.

Ramsey cursed softly.

On the ground, Ramsey could through the window that they were rious about the evacuation. Behind u rope ,barricade, a huge crowd milled about, waiting for a turn to board one of the suborbital transports, any one, just to get away from the city . . . and the volcano. A few policemen armed with electric stunners kept the evacuation from becoming disorderly.

Ramsey got up and walked nonchalantly down the aisle. One of the other passengers looked up at him inquisitively. "Just stretching my legs," he remarked casually. "Looks like we won't even get a chance to step outside." He stopped walking at a panel marked EMERGENCY EXIT. He looked around. Nobody else was paying any particular attention to him.

"TWIST KNOB. PULL HANDLE. REMOVE

ALL SHARP OBJECTS FROM POCKETS BEFORE SLIDING DOWN CHUTE." Ramsey reached out and twisted and pulled in a single smooth motion. The emergency exit popped open and the escape slide inflated with a loud pop. Before any of the startled passengers could react, he scooped up the briefcase Kirschmeyer had given him and dove headfirst down the chute.

One of the guards saw him just as he hit the ground. "Hey! Non autorizzato-" Ramsey dove into the mob, clutching the case firmly to his stomach, keeping his head down so his height and color wouldn't give him away. The guard started after him, but a second policeman grabbed the first and said something in rapid Italian. The first guard answered back, then shrugged his shoulders. After all, they were trying to keep the evacuation orderly, not to keep people from coming in. If some crazy American walked into the danger zone voluntarily, what was it to them?

Once outside, Ramsey quickly discovered that he had three major problems. He couldn't speak Italian. Even if he could, no one would be willing to take him anywhere near Vesuvius, for any amount of money . . . and he had no money anyway.

Kirschmeyer should have thought of these things before sending me off, he thought. Damn cowardly fool. He could have at least arranged to let somebody know he was coming.

He walked over toward the entrance. The road leaving the 'port was empty; the one entering was jammed. Thousands of abandoned cars were parked over the sidewalks and overflowing into the plaza. Ramsey grinned. It had been a long time since the old days on the south side . . . but he figured he could still remember how to hotwire a car.

It was easy enough to find the volcano. A huge plume of black smoke, lit from below with a lurid red light, rose into the evening sky like a giant pillar. As he got closer, hot ash began to fall out of the air.

Ten miles away he was stopped by a roadblock. A policeman stepped out of a hastily-constructed shanty and shouted something in Italian, took a good look at Ramsey, then repeated it in English. "No passage! The road closed. Go back!"

"I've got to get through!" Ramsey shouted back. "Urgent! Important!"

"Road closed!" the policeman repeated. "Dangerous! No passage!"

He could go back until he was out of sight. Ramsey thought, then try cutting across the countryside.

"Ramsey! Ramsey, is that you?"

"Doctor Williamson! What on Earth are you doing here'?"

"No time to explain. Where's Hans?"

"Not here. He sent me with some stuff." He held up Professor Kirschmeyer's briefcase.

"Good! Susan said he'd come through for her."

"Susan!" said Ramsey. "Where is she?"

Doctor Williamson pointed at the mountain. From here it was barely visible through the clouds of soot and ash. "There! See that outcropping, just below the lip? Just to the left of that."

"Gods!" said Ramsey. "How can she survive up there'?"

"She's warded, naturally."

"Right," said Ramsey. "Can you get them to let me through to her'?"

Doctor Williamson turned to the policeman and said something in Italian. The policeman went away for a moment and brought back another man, whom she also talked to. He raised the barricade and waved Ramsey through. Better hurry," she said. "Good luck."

The drive up the volcano was like a drive through hell. Twitted trunks of burned trees loomed out of the clouds of ash like the souls of the damned. Red hot rocks whizzed out of the sky and smashed to earth all around him. He drove as fast as he dared through the strange murky twilight. A flying rock zinged off the hood. Close behind it came another, smashing into the windshield. Through the cracks the stench of sulfur suffused into the car.

Ahead he saw an island of relative calm. The eye of the storm? Eyes stinging, he headed for it. As he approached, he saw it was a pentacle. Susan was inside, making an invocation. Near the pentacle Ramsey saw the pitted ruin of an expensive sports car. He put his stolen car next to it, grabbed the briefcase and dashed through the ash storm to the safety of the pentacle.

"Susan!"

"Ramsey! You made it!" Susan threw herself into his arms and kissed him. "Oh, Ramsey!" She looked around. "But where is Hans'? Didn't he come'?"

"No."

"No'? No? Why not?"

Ramsey was strangely reluctant to tell her that Kirschmeyer had chickened out, headed for the exact opposite side of the globe. "Well, he, uh-

"What?"

"When I left him he was headed for New Zealand," Ramsey said.

"New Zealand? Why-Oh, I see. So he doesn't think I can do it, huh? Thinks I can't calm it enough to stop the eruption. Merde! I wish he were here. I could sure use his touch."

"He said you knew everything he did."

"Balderdash. I'm damn good, but he's still better. Well, I gotta make do with what I got, I guess. So, how long do we have?"

"Huh? Oh! The data!" Ramsey opened the briefcase. Under the pile of magical equipment were two microdisks. Susan picked them up and plugged them into the portable next to her. She looked at the display.

"Well. Not much time, is there? We'd better get to it!"

At Wellington 'port, Hans Kirschmeyer was trying to rent a vehicle. "Don't you have any hovercars? I have to travel over water."

"Sorry, all we have at the moment are wheelies. Try back in an hour."

"An hour? In an hour, we'll all be dead! Is there anywhere else? I'm desperate!"

"Maybe dockside."

At the dock Kirschmeyer found only one rental place open. The proprietor, a lean blond kid in a sheepskin jacket, leaned against the counter. WE RENT ANYTHING, said the sign.

"Got any hovercars I can rent'?"

"Nope," the proprietor said.

"Aircraft? A seaplane, perhaps?"

"Nope."

"Motorboats?"

"Nope."

"Sailboat'?"

"Nope."

"Well, what have you got?"

The proprietor nodded down at the water. "Rowboat."

Kirschmeyer looked down. A tiny

skiff bobbed up and down in the swell. "I'll take it. How much?"

"You want it? She's yours."

"Thanks." Kirschmeyer threw in his bag, jumped in, and tossed off the mooring line.

"'Course," continued the proprietor laconically, "she ain't got no oars. . ."

Kirschmeyer wasn't listening. He balanced in the boat, facing the rear and chanting, waving his hands wildly.

The rental proprietor leaned even farther over the counter to watch. Behind the skiff, a wave rose out of the sea, picked up the boat, and hurled it forward. For a moment it seemed as if Kirschmeyer would fall face first into the water. He finally caught his balance, and continued his chanting. As the boat disappeared over the horizon it was still accelerating.

Susan stood facing the volcano, speaking in a loud, commanding tone, occasionally glancing down at the portable console at her feet and scowling. Once Ramsey started to say something, but she gestured him to stay silent

without ever breaking the cadence of her chant. Outside the tiny circle of calm, a nightmare scene of swirling black ash and streaks of orange flame writhed around them.

From out of the writhing ash, a deep, resonant voice seemed to speak unintelligible syllables in response to Susan's chants. Susan abruptly changed her chant, and made a new gesture with both hands. The voice got louder and deeper, almost turning into an inaudible subsonic rumble. Susan hit a key on the qwerty with her toe.

"Got him,"- she remarked conversationally.

"Naachforsitthannaguane," stated the voice in a cold, dispassionate tone. Outside the pentacle, the whirling clouds of ash seemed to form into a shape. Not exactly a face, but an inhuman presence. Ramsey felt as if some giant pair of eyes were behind him, watching him with bored indifference.

"Nail tcnepahh," Susan said in the same dispassionate tone. "Suumayeh anada. Tiirata na! Sooranala na! Tiir!"

"Doonoro tiir," the presence said. "Na k.si.s,sith, doon." Outside, flames shot up and swirled around the pentacle.

"Nadillil nabokikok," said Susan, and made a gesture. Deep violet flame shot from her hands and circled the pentacle.

"Doom" said the presence. The violet flame vanished. "Toorah." A sheet of deep orange flame formed around the pentacle and began to constrict. Susan waved one hand casually. The orange flame vanished.

"We're pretty evenly matched," Susan said to Ramsey. "So far I can't drive him back, but neither can he destroy me. "

"What then?"

"Niiratah doowl," said Susan. "Kirilak!"

"boon, sibborkah," replied the low voice dispassionately.

"Suns na nabolith," she said. "Damn. That didn't work either. Kirschmeyer was right. I don't quite have the control or the power to hold it. Almost, but not quite."

"What now?"

"It's going to erupt somewhere," she said calmly. "I don't have the power to hold that back. Not for long, anyway. But right now I still have a little control over exactly where it will erupt."

Suddenly Ramsey got it. "You mean, you can make the eruption happen somewhere else? Where there aren't any people? Like, say, the middle of the Pacific? Or, maybe, New Zealand?"

"Yeah. Something like that. Only I can't make it happen exactly anywhere. What I can do, though, is invert the eruption exactly. Make the eruption happen at exactly the other side of the Earth. "

"Which is'?"

"I checked it on the computer before we started. About 500 kilometers east, and maybe a hundred north, of the Chatham Islands. In the middle of the ocean. Off New Zealand."

"Where Professor Kirschmeyer is waiting to handle it."

"So I hope. "

She raised both hands over her head, and this time her voice was strong and confident. "SIBBOLAH! DIIRATAH! KAARANATATH NA TIIR! RAMANAH!"

She made a final, sweeping gesture.

"Tiir." The voice died away into a gentle sigh, almost too low to hear.

Outside the pentacle, the ashes swirled up once again, then began to settle. In moments the sky was clear.

Susan slumped down and gave a sigh of relief. "It's over."

Far to the south, there was a sudden flash of light. A tiny speck of fire hurled into the night sky, chased by a bolt of brilliant violet lightning. A moment later they heard the thunderclap. Ramsey jumped.

"What in the hell was that?"