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MATTER'S END

Gregory Benford

When Dr. Samuel Johnson felt himself getting tied up in an argument over Bishop Berkeley's ingenious sophistry to prove the nonexistence of matter, and that everything in the universe is merely ideal, he kicked a large stone and answered, "I refute it thus." Just what that action assured him of is not very obvious, but apparently he found it comforting.

--Sir Arthur Eddington

India came to him first as a breeze like soured buttermilk, rich yet tainted. A door banged somewhere, sending gusts sweeping through the Bangalore airport, slicing through the 4 A.M. silences.

Since the Free State of Bombay had left India, Bangalore had become an international airport. Yet the damp caress seemed to erase the sterile signatures that made all big airports alike, even giving a stippled texture to the cool enamel glow of the fluorescents.

The moist air clasped Robert Clay like a stranger's sweaty palm. The ripe, fleshy aroma of a continent enfolded him, swarming up his nostrils and soaking his lungs with sullen spice. He put down his carry-on bag and showed the immigration clerk his passport. The man gave him a piercing, ferocious stare--then mutely slammed a rubber stamp onto the pages and handed it back.

A hand snagged him as he headed toward baggage claim.

"Professor Clay?" The face was dark olive with intelligent eyes riding above sharp cheekbones. A sudden white grin flashed as Clay nodded. "Ah, good. I am Dr. Sudarshan Patil. Please come this way."

Dr. Patil's tone was polite, but his hands impatiently pulled Clay away from the sluggish lines, through a battered wooden side door. The heavy-lidded immigration guards were carefully looking in other directions, hands held behind their backs. Apparently they had been paid off and would ignore this odd exit. Clay was still groggy from trying to sleep on the flight from London. He shook his head as Patil led him into the gloom of a baggage storeroom.

"Your clothes," Patil said abruptly. "What?"

"They mark you as a Westerner. Quickly!"

Patil's hands, light as birds in the quilted soft light, were already plucking at his coat, his shirt. Clay was taken aback at this abruptness. He hesitated, then struggled out of the dirty garments, pulling his loose slacks down over his shoes. He handed his bundled clothes to Patil, who snatched them away without a word.

"You're welcome," Clay said. Patil took no notice, just thrust a wad of tan cotton at him. The man's eyes jumped at each distant sound in the storage room, darting, suspecting every pile of dusty bags.

Clay struggled into the pants and rough shirt. They looked dingy in the wan yellow glow of a single distant fluorescent tube.

"Not the reception I'd expected," Clay said, straightening the baggy pants and pulling at the rough drawstring.

"These are not good times for scientists in my country, Dr. Clay," Patil said biting. His voice carried that odd lilt that echoed both the Raj and Cambridge.

"Who're you afraid of?"

"Those who hate Westerners and their science."

"They said in Washington--"

"We are about great matters, Professor Clay. Please cooperate, please." Patil's lean face showed its bones starkly, as though energies pressed outward. Promontories of bunched muscle stretched a mottled canvas skin. He started toward a far door without another word, carrying Clay's overnight bag and jacket.

"Say, where're we--"

Patil swung open a sheet-metal door and beckoned. Clay slipped through it and into the moist wealth of night. His feet scraped on a dirty sidewalk beside a black tar road. The door hinge squealed behind them, attracting the attention of a knot of men beneath a vibrant yellow streetlight nearby.

The bleached fluorescence of the airport terminal was now a continent away. Beneath a line of quarter-ton trucks huddled figures slept. In the astringent street-lamp glow he saw a decrepit green Korean Tochat van parked at the curb.

"In!" Patil whispered.

The men under the streetlight started walking toward them, calling out hoarse questions.

Clay yanked open the van's sliding door and crawled into the second row of seats. A fog of unknown pungent smells engulfed him. The driver, a short man, hunched over the wheel. Patil sprang into the front seat and the van ground away, its low gear whining.

Shouts. A stone thumped against the van roof. Pebbles rattled at the back. They accelerated, the engine clattering. A figure loomed up from the shifting shadows and flung muck against the window near Clay's face. He jerked back at the slap of it. "Damn!"

They plowed through a wide puddle of dirty rainwater. The engine sputtered and for a moment Clay was sure it would die. He looked out the rear window and saw vague forms running after them. Then the engine surged again and they shot away.

They went two blocks through hectic traffic. Clay tried to get a clear look at India outside, but all he could see in the starkly shadowed street were the crisscrossings of three-wheeled taxis and human-drawn rickshaws. He got an impression of incessant activity, even in this desolate hour. Vehicles leaped out of the murk as headlights swept across them and then vanished utterly into the moist shadows again.

They suddenly swerved around a corner beneath spreading, gloomy trees. The van jolted into deep potholes and jerked to a stop. "Out!" Patil called.

Clay could barely make out a second van at the curb ahead. It was blue and caked with mud, but even in the dim light would not be confused with their green one. A rotting fetid reek filled his nose as he got out the side door, as if masses of overripe vegetation loomed in the shadows. Patil tugged him into the second van. In a few seconds they went surging out through a narrow, brick-lined alley. "Look, what--"

"Please, quiet," Patil said primly. "I am watching carefully now to be certain that we are not being followed."

They wound through a shantytown warren for several minutes. Their headlights picked up startled eyes that blinked from what Clay at first had taken to be bundles of rags lying against the shacks. They seemed impossibly small even to be children. Huddled against decaying tin lean-tos, the dim forms often did not stir even as the van splashed dirt) water on them from potholes.

Clay began, "Look, I understand the need for--"

"I apologize for our rude methods, Dr. Clay," Patil said. He gestured at the driver. "May I introduce Dr. Singh?"

Singh was similarly gaunt and intent, but with bushy hair and a thin, pointed nose. He jerked his head aside to peer at Clay, nodded twice like a puppet on strings, and then quickly stared back at the narrow lane ahead. Singh kept the van at a steady growl, abruptly yanking it around corners. A wooden cart lurched out of their way, its driver swearing in a strident singsong.

"Welcome to India," Singh said with reedy solemnity. "I am afraid circumstances are not the best."

"Uh, right. You two are heads of the project, they told me at the NSF."

"Yes," Patil said archly, "the project which officially no longer exists and unofficially is a brilliant success. It is amusing!"

"Yeah," Clay said cautiously, "we'll see."

"Oh, you will see," Singh said excitedly. "We have the events! More all the time."

Patil said precisely, "We would not have suggested

that your National Science Foundation send an observer to confirm our findings unless we believed them to be of the highest importance."

"You've seen proton decay?"

Patil beamed. "Without doubt."

"Damn."

"Exactly."

"What mode?"

"The straightforward pion and positron decay products."

Clay smiled, reserving judgment. Something about Patil's almost prissy precision made him wonder if this small, beleaguered team of Indian physicists might actually have brought it off. An immense long shot, of course, but possible. There were much bigger groups of particle physicists in Europe and the U.S. who had tried to detect proton decay using underground swimming pools of pure water. Those experiments had enjoyed all the benefits of the latest electronics. Clay had worked on the big American project in a Utah salt mine, before lean budgets and lack of results closed it down. It would be galling if this lone, underfunded Indian scheme had finally done it. Nobody at the NSF believed the story coming out of India.

Patil smiled at Clay's silence, a brilliant slash of white in the murk. Their headlights picked out small panes of glass stuck seemingly at random in nearby hovels, reflecting quick glints of yellow back into the van. The night seemed misty; their headlights forked ahead. Clay thought a soft rain had started outside, but then he saw that thousands of tiny insects darted into their headlights. Occasionally big ones smacked against the windshield.

Patil carefully changed the subject. "I... believe you will pass unnoticed, for the most part."

"I look Indian?"

"I hope you will not take offense if I remark that you do not. We requested an Indian, but your NSF said they did not have anyone qualified."

"Right. Nobody who could hop on a plane, anyway."

Or would, he added to himself.

"I understand. You are a compromise. If you will put this on..." Patil handed Clay a floppy khaki hat. "It will cover your curly hair. Luckily, your nose is rather more narrow than I had expected when the NSF cable announced they were sending a Negro."

"Got a lot of white genes in it, this nose," Clay said evenly.

"Please, do not think I am being racist. I simply wished to diminish the chances of you being recognized as a Westerner in the countryside."

"Think I can pass?"

"At a distance, yes."

"Be tougher at the site?"

"Yes. There are 'celebrants,' as they term themselves, at the mine."

"How'll we get in?"

"A ruse we have devised."

"Like that getaway back there? That was pretty slick."

Singh sent them jouncing along a rutted lane. Withered trees leaned against the pale stucco two-story buildings that lined the lane like children's blocks lined up not quite correctly. "Men in customs, they would give word to people outside. If you had gone through with the others, a different reception party would have been waiting for you."

"I see. But what about my bags?"

Patil had been peering forward at the gloomy jumble of buildings. His head jerked around to glare at Clay. "You were not to bring more than your carry-on bag!"

"Look, I can't get by on that. Chrissake, that'd give me just one change of clothes--"

"You left bags there?"

"Well, yeah, I had just one--"

Clay stopped when he saw the look on the two men's faces.

Patil said with strained clarity, "Your bags, they had identification tags?"

"Sure, airlines make you--"

"They will bring attention to you. There will be inquiries. The devotees will hear of it, inevitably, and know you have entered the country." Clay licked his lips. "Hell, I didn't think it was so important."

The two lean Indians glanced at each other, their faces taking on a narrowing, leaden cast. "Dr. Clay," Patil said stiffly, "the 'celebrants' believe, as do many, that Westerners deliberately destroyed our crops with their biotechnology."

"Japanese companies' biologists did that, I thought," Clay said diplomatically.

"Perhaps. Those who disturb us at the Kolar gold mine make no fine distinctions between biologists and physicists. They believe that we are disturbing the very bowels of the earth, helping to further the destruction, bringing on the very end of the world itself. Surely you can see that in India, the mother country of religious philosophy, such matters are important."

"But your work, hell, it's not a matter of life or death or anything."

"On the contrary, the decay of the proton is precisely an issue of death."

Clay settled back in his seat, puzzled, watching the silky night stream by, cloaking vague forms in its shadowed mysteries.

Clay insisted on the telephone call. A wan winter sun had already crawled partway up the sky before he awoke, and the two Indian physicists wanted to leave immediately. They had stopped while still in Bangalore, holing up in the cramped apartment of one of Patil's graduate students. As Clay took his first sip of tea, two other students had turned up with his bag, retrieved at a cost he never knew.

Clay said, "I promised I'd call home. Look, my family's worried. They read the papers, they know the trouble here."

Shaking his head slowly, Patil finished a scrap of curled brown bread that appeared to be his only breakfast. His movements had a smooth liquid inertia, as if the sultry morning air oozed like jelly around him.

They were sitting; at a low table that had one leg too short; the already rickety table kept lurching, slopping tea into their saucers. Clay had looked for something to prop up the leg, but the apartment was bare, as though no one lived here. They had slept on pallets beneath a single bare bulb. Through the open windows, bare of frames or glass, Clay had gotten fleeting glimpses of the neighborhood-rooms of random clutter, plaster peeling off slumped walls, revealing the thin steel cross-ribs of the buildings, stained windows adorned with gaudy pictures of many-armed gods, already sun-bleached and frayed. Children yelled and cried below, their voices reflected among the odd angles and apertures of the tangled streets, while carts rattled by and bare feet slapped the stones. Students had apparently stood guard last night, though Clay had never seen more than a quick motion in the shadows below as they arrived.

"You ask much of us," Patil said. By morning light his walnut-brown face seemed gullied and worn. Lines radiated from his mouth toward intense eyes.

Clay sipped his tea before answering. A soft, strangely sweet smell wafted through the open window. They sat well back in the room so nobody could see in from the nearby buildings. He heard Singh tinkering downstairs with the van's engine.

"Okay, it's maybe slightly risky. But I want my people to know I got here all right."

"There are few telephones here."

"I only need one."

"The system, often it does not work at all."

"Gotta try."

"Perhaps you do not understand--"

"I understand damn well that ill can't even reach my people, I'm not going to hang out here for long. And if I don't see that your experiment works right, nobody'll believe you."

"And your opinion depends upon ... ?"

Clay ticked off points on his fingers. "On seeing the apparatus Checking your raw data. Running a trial case to see your system response. Then a null experiment--"

to verify your threshold level on each detector." He held up five fingers. "The works."

Patil said gravely, "Very good. We relish the opportunity to prove ourselves."

"You'll get it." Clay hoped to himself that they were wrong, but he suppressed that. He represented the faltering forefront of particle physics, and it would be embarrassing if a backwater research team had beaten the world. Still, either way, he would end up being the expert on the Kolar program, and that was a smart career move in itself.

"Very well. I must make arrangements for the call, then. But I truly--"

"Just do it. Then we get down to business." The telephone was behind two counters and three doors at a Ministry for Controls office. Patil did the bribing and cajoling inside and then brought Clay in from the back of the van. He had been lying down on the back seat so he could not be seen easily from the street.

The telephone itself was a heavy black plastic thing with a rotary dial that clicked like a sluggish insect as it whirled. Patil had been on it twice already, clearing international lines through Bombay. Clay got two false rings and a dead line. On the fourth try he heard a faint, somehow familiar buzzing. Then a hollow, distant click.

"Daddy, is that you?" Faint rock music in the background "Sure, I just wanted to let you know I got to India okay."

"Oh, Mommy will be so glad! We heard on the TV last night that there's trouble over there."

Startled, Clay asked, "What? Where's your mother?"

"Getting groceries. She'll be so mad she missed your call!"

"You tell her I'm fine, okay? But what trouble?"

"Something about a state leaving India. Lots of fighting, John Trimble said on the news."

Clay never remembered the names of news announcers; he regarded them as faceless nobodies reading prepared scripts, but for his daughter they were

the voice of authority. "Where?"

"Uh, the lower part."

"There's nothing like that happening here, honey. I'm safe. Tell Mommy."

"People have ice cream there?"

"Yeah, but I haven't seen any. You tell your mother what I said, remember?' About being safe?"

"Yes, she's been worried."

"Don't worry, Angy. Look, I got to go." The line popped and hissed ominously.

"I miss you, Daddy."

"I miss you double that. No, squared."

She laughed merrily. "I skinned my knee today at recess. It bled so much I had to go to the nurse."

"Keep it clean, honey. And give your mother my love."

"She'll be so mad."

"I'll be home soon."

She giggled and ended with the joke she had been using lately. "G'bye, Daddy. It's been real."

Her light laugh trickled into the static, a grace note from a bright land worlds away. Clay chuckled as he replaced the receiver. She cut the last word of "real nice" to make her good-byes hip and sardonic, a mannerism she had heard on television somewhere. An old joke; he had heard that even "groovy" was coming back in.

Clay smiled and pulled his hat down further and went quickly out into the street where Patil was waiting. India flickered at the edge of his vision, the crowds a hovering presence.

They left Bangalore in two vans. Graduate students drove the green Tochat from the previous night. He and Patil and Singh took the blue one, Clay again keeping out of sight by lying on the back seat. The day's raw heat rose around them like a shimmering lake of light.

They passed through lands leached of color. Only gray stubble grew in the fields. Trees hung limply, their limbs bowing as though exhausted. Figures in rags

huddled for shade. A few stirred, eyes white in the shadows, as the vans ground past. Clay saw that large boles sat on the branches like gnarled knots with brown sheaths wrapped around the underside.

"Those some of the plant diseases I heard about?" he asked.

Singh pursed his lips. "I fear those are the pouches like those of wasps, as reported in the press." His watery eyes regarded the withered, graying trees as Patil slowed the car.

"Are they dangerous?" Clay could see yellow sap dripping from the underside of each.

"Not until they ripen," Singh said. "Then the assassins emerge."

"They look pretty big already."

"They are said to be large creatures, but of course there is little experience." Patil downshifted and they accelerated away with an occasional sputtering misfire. Clay wondered whether they had any spare spark plugs along. The fields on each side of the road took on a dissolute and shredded look. "Did the genetech experiments cause this?" he asked.

Singh nodded. "I believe this emerged from the European programs. First we had their designed plants, but then pests found vulnerability. They sought strains which could protect crops from the new pests. So we got these wasps.

I gather that now some error or mutation has made them equally excellent at preying on people and even cows."

Clay frowned. "The wasps came from the Japanese aid, didn't they?" Patil smiled mysteriously. "You know a good deal about our troubles, sir." Neither said anything more. Clay was acutely conscious that his briefing in Washington had been detailed technical assessments, without the slightest mention of how the Indians themselves saw their problems. Singh and Patil seemed either resigned or unconcerned; he could not tell which. Their sentences refracted from some unseen nugget, like seismic waves warping around the earth's core.

"I would not worry greatly about these pouches,"

Singh said after they had ridden in silence for a while. "They should not ripen before we are done with our task. In any case, the Kolar fields are quite barren, and afford few sites where the pouches can grow."

Clay pointed out the front window. "Those round things on the walls, more pouches?"

To his surprise, both men burst into merry laughter. Gasping, Patil said, "Examine them closely, Doctor Clay. Notice the marks of the species which made them."

Patil slowed the car and Clay studied the round, circular pads on the whitewashed vertical walls along the road. They were brown and matted and marked in a pattern of radial lines. Clay frowned and then felt enormously stupid: the thick lines were handprints.

"Drying cakes, they are," Patil said, still chuckling.

"Of what?"

"Dung, my colleague. We use the cow here, not merely slaughter it."

"What for?"

"Fuel. After the cakes dry, we stack them--see?" They passed a plastic-wrapped tower. A woman was adding a circular, annular tier of thick dung disks to the top, then carefully folding the plastic over it. "In winter they burn nicely."

"For heating?"

"And cooking, yes."

Seeing the look on Clay's face, Singh's eyes narrowed and his lips drew back so that his teeth were bright stubs. His eyebrows were long brush strokes that met the deep furrows of his frown. "Old ways are still often preferable to the new."

Sure, Clay thought, the past of cholera, plague, infanticide. But he asked with neutral politeness, "Such as?"

"Some large fish from the Amazon were introduced into our principal river three years ago to improve fishing yields."

"The Ganges? I thought it was holy."

"What is more holy than to feed the hungry?"

"True enough. Did it work?"

"The big fish, yes. They are delicious. A great delicacy."

"I'll have to try some," Clay said, remembering the thin vegetarian curry he had eaten at breakfast.

Singh said, "But the Amazon sample contained some minute eggs which none of the proper procedures eliminated. They were of a small species-the candiru, is that not the name?" he inquired politely of Patil.

"Yes," Patil said, "a little being who thrives mostly on the urine of larger fish. Specialists now believe that perhaps the eggs were inside the larger species, and so escaped detection."

Patil's voice remained calm and factual, although while he spoke he abruptly swerved to avoid a goat that spontaneously ambled onto the rough road. Clay rocked hard against the van's door, and Patil then corrected further to stay out of a gratuitous mudhole that seemed to leap at them from the rushing foreground. They bumped noisily over ruts at the road's edge and bounced back onto the tarmac without losing speed. Patil sat ramrod straight, hands turning the steering wheel lightly, oblivious to the wrenching effects of his driving.

"Suppose, Professor Clay, that you are a devotee," Singh said. "You have saved to come to the Ganges for a decade, for two. Perhaps you even plan to die there."

"Yeah, okay." Clay could not see where this was leading.

"You are enthused as you enter the river to bathe. You are perhaps profoundly affected. An intense spiritual moment. It is not uncommon to merge with the river, to inadvertently urinate into it."

Singh spread his hands as if to say that such things went without saying. "Then the candiru will be attracted by the smell. It mistakes this great bountiful largess, the food it needs, as coming from a very great fish indeed. It excitedly swims up the stream of uric acid. Coming to your urethra, it swims like a snake into its burrow, as far up as it can go. You will see that the uric flow velocity will increase as the candiru makes its way upstream, inside you. When this tiny fish can make no

further progress, some trick of evolution tells it to protrude a set of sidewise spines. So intricate!"

Singh paused a moment in smiling tribute to this intriguing facet of nature. Clay nodded, his mouth dry.

"These embed deeply in the walls and keep the candiru close to the source of what it so desires." Singh made short, delicate movements, his fingers jutting in the air. Clay opened his mouth, but said nothing.

Patil took them around a team of bullocks towing a wooden wagon and put in. The pain is intense. Apparently there is no good treatment. Women--forgive this indelicacy--must be opened to get at the offending tiny fish before it swells and blocks the passage completely, having gorged itself insensate. Some men have an even worse choice. Their bladders are already engorged, having typically not been much emptied by the time the candiru enters. They must decide whether to attempt the slow procedure of poisoning the small thing and waiting for it to shrivel and withdraw its spines.

However, their bladders might burst before that, flooding their abdomens with urine and of course killing them. If there is not sufficient time . . ."

"Yes?" Clay asked tensely.

"Then the penis must be chopped off," Singh said, "with the candiru inside."

Through a long silence Clay rode, swaying as the car wove through limitless flat spaces of parched fields and ruined brick walls and slumped whitewashed huts. Finally he said hoarsely, "I... don't blame you for resenting the ... well, the people who brought all this on you. The devotees--"

"They believe this apocalyptic evil comes from the philosophy which gave us modern science."

"Well, look, whoever brought over those fish--"

Singh's eyes widened with surprise. A startled grin lit his face like a sunrise. "Oh no, Professor Clay! We do not blame the errors, or else we would have to blame equally the successes!"

To Clay's consternation, Patil nodded sagely.

He decided to say nothing more. Washington had warned him to stay out of political discussions, and though he was not sure if this was such, or if the lighthearted way Singh and Patil had related their story told their true attitude, it seemed best to just shut up. Again Clay had the odd sensation that here the cool certainties of Western biology had become diffused, blunted, crisp distinctions rendered into something beyond the constraints of the world outside, all blurred by the swarming, dissolving currents of India. The tin-gray sky loomed over a plain of ripe rot. The urgency of decay here was far more powerful than the abstractions that so often filled his head, the digitized iconography of sputtering, splitting protons.

The Kolar gold fields were a long, dusty drive from Bangalore. The sway of the van made Clay sleepy in the back, jet lag pulling him down into fitful, shallow dreams of muted voices, shadowy faces, and obscure purpose. He awoke frequently amid the dry smells, lurched up to see dry farmland stretching to the horizon, and collapsed again to bury his face in the pillow he had made by wadding up a shirt.

They passed through innumerable villages that, after the first few, all seemed alike with their scrawny children, ramshackle sheds, tin roofs, and general air of sleepy dilapidation. Once, in a narrow town, they stopped as rickshaws and carts backed up. An emaciated cow with pink paper tassels on its horns stood square in the middle of the road, trembling. Shouts and honks failed to move it, but no one ahead made the slightest effort to prod it aside. Clay got out of the van to stretch his legs, ignoring Patil's warning to stay hidden, and watched. A crowd collected, shouting and chanting at the cow but not touching it. The cow shook its head, peering at the road as if searching for grass, and urinated powerfully. A woman in a red sari rushed into the road, knelt, and thrust her hand into the full stream. She made a formal motion with her other hand and splashed some urine on her forehead and cheeks. Three other women had already lined up behind her, and each did the same. Disturbed, the cow waggled its head and shakily walked away. Traffic

started up, and Clay climbed back into the van. As they ground out of the dusty town, Singh explained that holy bovine urine was widely held to have positive health effects.

"Many believe it settles stomach troubles, banishes headaches, even improves fertility," Singh said.

"Yeah, you could sure use more fertility." Clay gestured at the throngs that filled the narrow clay sidewalks.

"I am not so Indian that I cannot find it within myself to agree with you, Professor Clay," Singh said.

"Sorry for the sarcasm. I'm tired."

"Patil and I are already under a cloud simply because we are scientists, and therefore polluted with Western ideas."

"Can't blame Indians for being down on us. Things're getting rough."

"But you are a black man. You yourself were persecuted by Western societies."

"That was a while back."

"And despite it you have risen to a professorship."

"You do the work, you get the job." Clay took off his hat and wiped his brow. The midday heat pressed sweat from him.

"Then you do not feel alienated from Western ideals?" Patil put in. "Hell no. Look, I'm not some sharecropper who pulled himself up from poverty. I grew up in Falls Church, Virginia. Father's a federal bureaucrat. Middle class all the way."

"I see," Patil said, eyes never leaving the rutted road. "Your race bespeaks an entirely different culture, but you subscribe to the program of modern rationalism."

Clay looked at them quizzically. "Don't you?"

"As scientists, of course. But that is not all of life."

"Um," Clay said.

A thousand times before he had endured the affably condescending attention of whites, their curious eyes searching his face. No matter what the topic, they somehow found a way to inquire indirectly after his *true*

feelings, his *natural* emotions. And if he waved away these intrusions, there remained in their heavy-lidded eyes a subtle skepticism, doubts about his authenticity. Few gave him space to simply be a suburban man with darker skin, a man whose interior landscape was populated with the same icons of Middle America as their own. Hell, his family name came from slaves, given as a tribute to Henry Clay, a nineteenth-century legislator. He had never expected to run into stereotyping in India, for chrissakes.

Still, he was savvy enough to lard his talk with some homey touches, jimmy things up with collard greens and black-eyed peas and street jive. It might put them at ease.

"I believe a li'l rationality could help," he said.

"Um." Singh's thin mouth twisted doubtfully. "Perhaps you should regard India as the great chessboard of our times, Professor. Here we have arisen from the great primordial agrarian times, fashioned our gods from our soil and age. Then we had orderly thinking, with all its assumptions, thrust upon us by the British. Now they are all gone, and we are suspended between the miasmatic truths of the past, and the failed strictures of the present."

Clay looked out the dirty window and suppressed a smile. Even the physicists here spouted mumbo jumbo. They even appeared solemnly respectful of the devotees, who were just crazies like the women by the cow. How could anything solid come out of such a swamp? The chances that their experiment was right dwindled with each lurching, damp mile.

They climbed into the long range of hills before the Kolar fields. Burnedtan grass shimmered in the prickly heat. Sugarcane fields and rice paddies stood bone dry. In the villages, thin figures shaded beneath awnings, canvas tents, lean-tos, watched them pass. Lean faces betrayed only dim, momentary interest, and Clay wondered if his uncomfortable disguise was necessary outside Bangalore.

Without stopping they ate their lunch of dried fruit

and thin, brown bread. In a high hill town, Patil stopped to refill his water bottle at a well. Clay peered out and saw down an alley a gang of stick-figure boys chasing a dog. They hemmed it in, and the bedraggled hound fled yapping from one side of their circle to the other. The animal whined at each rebuff and twice lost its footing on the cobblestones, sprawling, only to scramble up again and rush on. It was a cruel game, and the boys were strangely silent, playing without laughter. The dog was tiring; they drew in their circle.

A harsh edge to the boys' shouts made Clay slide open the van door. Several men were standing beneath a rust-scabbed sheet-metal awning nearby, and their eyes widened when they saw his face. They talked rapidly among themselves. Clay hesitated. The boys down the alley rushed the dog. They grabbed it as it yapped futilely and tried to bite them. They slipped twine around its jaws and silenced it. Shouting, they hoisted it into the air and marched off.

Clay gave up and slammed the door. The men came from under the awning. One rapped on the window. Clay just stared at them. One thumped on the door. Gestures, loud talk.

Patil and Singh came running, shouted something. Singh pushed the men away, chattering at them while Patil got the van started. Singh slammed the door in the face of a man with wild eyes. Patil gunned the engine and they ground away.

"They saw me and--"

"Distrust of outsiders is great here," Singh said. "They may be connected with the devotees, too."

"Guess I better keep my hat on."

"It would be advisable."

"I don't know, those boys--I was going to stop them pestering that dog. Stupid, I guess, but--"

"You will have to avoid being sentimental about such matters," Patil said severely.

"Uh--sentimental?"

"The boys were not playing."

"I don't--"

"They will devour it," Singh said.

Clay blinked. "Hindus eating meat.?"

"Hard times. I am really quite surprised that such an animal has survived this long," Patil said judiciously. "Dogs are uncommon. I imagine it was wild, living in the countryside, and ventured into town in search of garbage scraps."

The land rose as Clay watched the shimmering heat bend and flex the seemingly solid hills.

They pulled another dodge at the mine. The lead green van veered off toward the main entrance, a cluster of concrete buildings and conveyer assemblies. From a distance, the physicists in the blue van watched a ragtag group envelop the van before it had fully stopped.

"Devotees," Singh said abstractedly. "They search each vehicle for evidence of our research."

"Your graduate students, the mob'll let them pass?"

Patil peered through binoculars. "The crowd is administering a bit of a pushing about," he said in his oddly cadenced accent, combining lofty British diction with a singsong lilt.

"Damn, won't the mine people get rid--"

"Some mine workers are among the crowd, I should imagine," Patil said.

"They are beating the students."

"Well, can't we--"

"No time to waste." Singh waved them back into the blue van. "Let us make use of this diversion."

"But we could--"

"The students made their sacrifice for you. Do not devalue it, please."

Clay did not take his eyes from the nasty knot of confusion until they lurched over the ridgeline. Patil explained that they had been making regular runs to the main entrance for months now, to establish a pattern that drew devotees away from the secondary entrance.

"All this was necessary, and insured that we could bring in a foreign inspector," Patil concluded. Clay

awkwardly thanked him for the attention to detail. He wanted to voice his embarrassment at having students roughed up simply to provide him cover, but something in the offhand manner of the two Indians made him hold his tongue.

The secondary entrance to the Kolar mine was a wide, tin-roofed shed like a low aircraft hangar. Girders crisscrossed it at angles that seemed to Clay dictated less by the constraints of mechanics than by the whims of the construction team. Cables looped among the already rusting steel struts and sang low notes in the rot-tinged wind that brushed his hair.

Monkeys chattered and scampered high in the struts. The three men walked into the shed, carrying cases. The cables began humming softly. The weave above their heads tightened with pops and sharp cracks. Clay realized that the seemingly random array was a complicated hoist that had started to pull the elevator up from miles beneath their feet. The steel lattice groaned as if it already knew how much work it had to do.

When it arrived, he saw that the elevator was a huge rattling box that reeked of machine oil. Clay lugged his cases in. The walls were broad wooden slats covered with chicken wire. Heat radiated from them. Patil stabbed a button on the big control board and they dropped quickly. The numbers of the levels zipped by on an amber digital display. A single dim yellow bulb cast shadows onto the wire. At the fifty-third level the bulb went out. The elevator did not stop.

In the enveloping blackness Clay felt himself lighten, as if the elevator was speeding up.

"Do not be alarmed," Patil called. "This frequently occurs."

Clay wondered if he meant the faster box or the light bulb. In the complete dark, he began to see blue phantoms leaping out from nowhere.

Abruptly he became heavy--and thought of Einstein's *Gedanken* experiment, which equated a man in an accelerating elevator to one standing on a planet. Unless Clay could see outside, check that the massive

earth raced by beyond as it clasped him further into its depths, in principle he could be in either situation. He tried to recall how Einstein had reasoned from an imaginary elevator to deduce that matter curved space-time, and could not.

Einstein's elegant proof was impossibly far from the pressing truth of *this* elevator. Here Clay plunged in thick murk, a weight of tortured air prickling his nose, making sweat pop from his face. Oily, moist heat climbed into Clay's sinuses.

And he was not being carried aloft by this elevator, but allowed to plunge into heavy, primordial darkness--Einstein's vision in reverse. No classical coolness separated him from the press of a raw, random world. That European mindscape--Galileo's crisp cylinders rolling obediently down inclined planes, Einstein's dispassionate observers surveying their smooth geometrics like scrupulous bank clerks--evaporated here like yesterday's stale champagne. Sudden anxiety filled his throat. His stomach tightened and he tasted acrid gorge. He opened his mouth to shout, and as if to stop him, his own knees sagged with suddenly returning weight, physics regained.

A rattling thump--and they stopped. He felt Patil slam aside the rattling gate. A sullen glow beyond bathed an ornate brass shrine to a Hindu god. They came out into a steeped room of carved rock. Clay felt a breath of slightly cooler air from a cardboard-mouthed conduit nearby.

"We must force the air down from above." Patil gestured. "Otherwise this would read well over a hundred and ten Fahrenheit." He proudly pointed to an ancient battered British thermometer, whose mercury stood at ninetyeight.

They trudged through several tunnels, descended another few hundred feet on a ramp, and then followed gleaming railroad tracks. A white bulb every ten meters threw everything into exaggerated relief, shadows stabbing everywhere. A brown cardboard sign proclaimed from the ceiling:

FIRST EVER COSMIC RAY NEUTRINO INTERACTION
RECORDED HERE IN APRIL 1965

For over forty years, teams of devoted Indian physicists had labored patiently inside the Kolar gold fields. For half a century, India's high mountains and deep mines had made important cosmic-ray experiments possible with inexpensive instruments. Clay recalled how a joint Anglo-Indian-Japanese team had detected that first neutrino, scooped it from the unending cosmic sleet that penetrated even to this depth. He thought of unsung Indian physicists sweating here, tending the instruments and tracing the myriad sources of background error. Yet they themselves were background for the original purpose of the deep holes: Two narrow cars clunked past, full of chopped stone.

"Some still work this portion," Patil's clear voice cut through the muffled air. "Though I suspect they harvest little."

Pushing the rusty cars were four wiry men, so sweaty that the glaring bulbs gave their sliding muscles a hard sheen like living stone. They wore filthy cloths wrapped around their heads, as if they needed protection against the low ceiling rather than the heat. As Clay stumbled on, he felt that there might be truth to this, because he sensed the mass above as a precarious judgment over them all, a sullen presence. Einstein's crisp distinctions, the clean certainty of the *Gedanken* experiments, meant nothing in this blurred air.

They rounded an irregular curve and met a niche neatly cut off by a chainlink fence.

PROTON STABILITY EXPERIMENT
TATA INSTITUTE OF FUNDAMENTAL RESEARCH, BOMBAY
80th Level Heathcote Shaft, KFG
2300 meters depth

These preliminaries done, the experiment itself began abruptly. Clay had expected some assembly rooms, an office, refrigerated 'scope cages. Instead, a

few meters ahead the tunnel opened in all directions. They stood before a huge bay roughly cleaved from the brown rock.

And filling the vast volume was what seemed to be a wall as substantial as the rock itself. It was an iron grid of rusted pipe. The pipes were square, not round, and dwindled into the distance. Each had a dusty seal, a pressure dial, and a number painted in white. Clay estimated them to be at least a hundred feet long. They were stacked Lincoln-log fashion. He walked to the edge of the bay and looked down. Layers of pipe tapered away below to a distant floodlit floor and soared to meet the gray ceiling above. "Enormous," he said.

"We expended great effort in scaling up our earlier apparatus," Singh said enthusiastically.

"As big as a house."

Patil said merrily, "An American house, perhaps. Ours are smaller."

A woman's voice nearby said, "And nothing lives in this iron house, Professor Clay."

Clay turned to see a willowy Indian woman regarding him with a wry smile. She seemed to have come out of the shadows, a brown apparition in shorts and a scrupulously white blouse, appearing fullblown where a moment before there had been nothing. Her heavy eyebrows rose in amuseincur. "Ah, this is Mrs. Buli," Patil said.

"I keep matters running here, while my colleagues venture into the world," she said.

Clay accepted her coolly offered hand. She gave him one quick, well defined shake and stepped back. "I can assist your assessment, perhaps."

"I'll need all your help," he said sincerely. The skimpy surroundings already made him wonder if he could do his job at all. "Labor we have," she said. "Equipment, little,"

"I brought some cross-check programs with me," he said.

"Excellent," Mrs. Buli said. "I shall have several of my graduate students assist you, and of course I offer my full devotion as well."

Clay smiled at her antique formality. She led him down a passage into the soft fluorescent glow of a large data-taking room. It was crammed with terminals and a bank of disk drives, all meshed by the usual cable spaghetti. "We keep our computers cooler than our staff, you see," Mrs. Buli said with a small smile.

They went down a ramp, and Clay could feel the rock's steady heat. They came out onto the floor of the cavern. Thick I-beams roofed the stone box.

"Over a dozen lives, that was the cost of this excavation," Singh said.

"That many?"

"They attempted to save on the cost of explosives," Patil said with a stern look.

"Not that such will matter in the long run," Singh said mildly. Clay chose not to pursue the point.

Protective bolts studded the sheer rock, anchoring cross-beams that stabilized the tower of pipes. Scaffolding covered some sections of the block and rusty pile. Blasts of compressed air from the surface a mile above swept down on them from the ceiling, flapping Clay's shirt.

Mrs. Buli had to shout, the effort contorting her smooth face. "We obtained the pipes from a government program that attempted to improve the quality of plumbing in the cities. A failure, I fear. But a godsend for us."

Patil was pointing out electrical details when the air conduits wheezed into silence. "Hope that's temporary," Clay said in the sudden quiet. "A minor repair, I am sure," Patil said. "These occur often," Singh agreed earnestly.

Clay could already feel prickly sweat oozing from him. He wondered how often they had glitches in the circuitry down here, awash in pressing heat, and how much that could screw up even the best diagnostics.

Mrs. Buli went on in a lecturer's singsong. "We hired engineering students, there are many such, an oversupply--to thread a single wire down the bore of each pipe. We sealed each, then welded them together to make lengths of a hundred feet. Then we filled them

with argon and linked them with a high-voltage line. We have found that a voltage of 280 khz ..."

Clay nodded, filing away details, noting where her description differed from that of the NSF. The Kolar group had continuously modified their experiment for decades, and this latest enormous expansion was badly documented. Still, the principle was simple. Each pipe was held at high voltage, so that when a charged particle passed through, a spark leaped. A particle's path was followed by counting the segments of triggered pipes. This mammoth stack of iron was a huge Geiger counter.

He leaned back, nodding at Buli's lecture, watching a team of men at the very top. A loud clang rang through the chasm. Sparks showered, burnt orange and blue. The garish plumes silhouetted the welders and sent cascades of sparks down through the lattice of pipes. For an instant Clay imagined he was witnessing cosmic rays sleeting down through the towering house of iron, illuminating it with their short, sputtering lives.

"--and I am confident that we have seen well over fifty true events," Mrs. Buli concluded with a jaunty upward tilt of her chin.

"What?" Clay struggled back from his daydreaming. "That many?"

She laughed, a high tinkling. "You do not believe!"

"Well, that is a lot."

"Our detecting mass is now larger," Mrs. Buli said.

"Last we heard it was five hundred tons," Clay said carefully. The claims wired to the NSF and the Royal Society had been skimpy on details.

"That was years ago," Patil said. "We have redoubled our efforts, as you can see."

"Well, to see that many decays, you'd have to have a hell of a lot of observing volume," Clay said doubtfully.

"We can boast of five *thousand* tons, Professor Clay," Mrs. Buli said.

"Looks it," Clay said laconically to cover his surprise. It would not do to let them think they could overwhelm him with magnitudes. Question was, did they have the

telltale events?

The cooling air came on with a thump and *whoosh*. Clay breathed it in deeply, face turned up to the iron house where protons might be dying, and sucked in swarming scents of the parched countryside miles above.

He knew from the start that there would be no eureka moment. Certainty was the child of tedium.

He traced the tangled circuitry for two days before he trusted it. "You got to open the sack 'fore I'll believe there's a cat in there," he told Mrs. Buli, and then had to explain that he was joking.

Then came a three-day trial run, measuring the exact sputter of decay from a known radioactive source. System response was surprisingly good. He found their techniques needlessly Byzantine, but workable. His null checks of the detectors inside the pipes came up goose-egg clean.

Care was essential. Proton decay was rare. The Grand Unified Theories which had enjoyed such success in predicting new particles had also sounded a somber note through all of physics. Matter was mortal. But not very mortal, compared with the passing flicker of a human lifetime.

The human body had about 10^{29} neutrons and protons in it. If only a tiny fraction of them decayed in a human lifetime, the radiation from the disintegration would quickly kill everyone of cancer. The survival of even small life-forms implied that the protons inside each nucleus had to survive an average of nearly a billion billion years.

So even before the Grand Unified Theories, physicists knew that protons lived long. The acronym for the theories was GUTs, and a decade earlier graduate students like Clay had worn T-shirts with insider jokes like IT TAKES GUTS TO DO PARTICLE PHYSICS. But proving that there was some truth to the lame nerd jests took enormous effort.

The simplest of the GUTs predicted a proton lifetime of about 10^{31} years, immensely greater than the limit set by the existence of life. In fact, it was far longer

even than the age of the universe, which was only a paltry 2×10^{10} years old.

One could check this lifetime by taking one proton and watching it for

10^{31} years. Given the short attention span of humans, it was better to assemble

10^{31} protons and watch them for a year, hoping one would fizzle. Physicists in the United States, Japan, Italy, and India had done that all through the 1980s and 1990s. And no protons had died.

Well, the theorists had said, the mathematics must be more complicated. They discarded certain symmetry groups and thrust others forward. The lifetime might be 10^{32} years, then.

The favored method of gathering protons was to use those in water. Western physicists carved swimming pools six stories deep in salt mines and eagerly watched for the characteristic blue pulse of dying matter. Detecting longer lifetimes meant waiting longer, which nobody liked, or adding more protons. Digging bigger swimming pools was easy, so attention had turned to the United States and Japan... but still, no protons died. The lifetime exceeded 10^{32} years.

The austerity of the 1990s had shut down the ambitious experiments in the West. Few remembered this forlorn experiment in Kolar, wedded to watching the cores of iron rods for the quick spurt of decay. When political difficulties cut off contact, the already beleaguered physicists in the West assumed the Kolar effort had ceased.

But Kolar was the deepest experiment, less troubled by the hail of cosmic rays that polluted the Western data. Clay came to appreciate that as he scrolled through the myriad event-plots in the Kolar computer cubes.

There were 9×10^9 recorded decays of all types. The system rejected obvious garbage events, but there were many subtle enigmas. Theory said that protons died because the quarks that composed them could change their identities. A seemingly capricious alteration of quark states sent the proton asunder,

spitting forth a zoo of fragments. Neutrons were untroubled by this, for in free space they decayed anyway, into a proton and electron. Matter's end hinged, finally, on the stability of the proton alone.

Clay saw immediately that the Kolar group had invested years in their software. They had already filtered out thousands of phantom events that imitated true proton decay. There were eighteen ways a proton could die, each with a different signature of spraying light and particle debris.

The delicate tracteries of particle paths were recorded as flashes and sparkles in the house of iron outside. Clay searched through endless graphic printouts, filigrees woven from digital cloth.

"You will find we have pondered each candidate event," Mrs. Buli said mildly on the sixth day of Clay's labors.

"Yeah, the analysis is sharp," he said cautiously. He was surprised at the high level of the work but did not want to concede anything yet. "If any ambiguity arose, we discarded the case."

"I can see that."

"Some pions were not detected in the right energy range, so of course we omitted those."

"Good."

Mrs. Buli leaned over to show him a detail of the cross-checking program, and he caught a heady trace of wildflowers. Her perfume reminded him abruptly that her sari wrapped over warm, ample swells. She had no sagging softness, no self-indulgent bulgings. The long oval of her face and her ample lips conveyed a fragile sensuality...

He wrenched his attention back to physics and stared hard at the screen. Event vertices were like time-lapse photos of traffic accidents, intersections exploding, screaming into shards. The crystalline mathematical order of physics led to riots of incandescence. And Clay was judge, weighing testimony after the chaos.

He had insisted on analyzing the several thousand preliminary candidates himself, as a double blind against the Kolar group's software. After nine days, he had isolated sixty-seven events that looked like the genuine article.

Sixty-five of his agreed with Mrs. Buli's analysis. The two holdouts were close, Clay had to admit.

"Nearly on the money," he said reflectively as he stared at the Kolar software's array.

"You express such values," Mrs. Buli said. "Always a financial analogy."

"Just a way of speaking."

"Still, let us discard the two offending events."

"Well, I'd be willing--"

"No, uh, we consider only the sixty-five." Her almond eyes gave no hint of slyness.

"They're pretty good bets, I'd say." Her eyebrows arched. "Only a manner of speech."

"Then you feel they fit the needs of theory."

Her carefully balanced way of phrasing made him lean forward, as if to compensate for his judge's role. "I'll have to consider all the other decay modes in detail. Look for really obscure processes that might mimic the real thing."

She nodded. "True, there is need to study such."

Protons could die from outside causes, too. Wraithlike neutrinos spewed forth by the sun penetrated even here, shattering protons. Murderous muons lumbered through as cosmic rays, plowing furrows of exploding nuclei.

Still, things looked good. He was surprised at their success, earned by great labor. "I'll be as quick about it as I can."

"We have prepared a radio link that we can use, should the desire come."

"Huh? What?"

"In case you need to reach your colleagues in America."

"Ah, yes."

To announce the result, he saw. To get the word out.
But why the rush?

It occurred to him that they might doubt whether he himself would get out at all.

They slept each night in a clutch of tin lean-tos that cowered down a raw ravine. Laborers from the mine had slept there in better days, and the physicists had gotten the plumbing to work for an hour each night. The men slept in a long shed, but gave Clay a small wooden shack. He ate thin, mealy gruel with them each evening, carefully dropping purification tablets in his water, and was rewarded with untroubled bowels. He lost weight in the heat of the mine, but the nights were cool and the breezes that came then were soft with moisture.

The fifth evening, as they sat around a potbellied iron stove in the men's shed, Patil pointed to a distant corrugated metal hut and said, "There we have concealed a satellite dish. We can knock away the roof and transmit, if you like."

Clay brightened. "Can I call home?"

"If need be."

Something in Patil's tone told him a frivolous purpose was not going to receive their cooperation. "Maybe tomorrow?"

"Perhaps. We must be sure that the devotees do not see us reveal it."

"They think we're laborers?"

"So we have convinced them, I believe."

"And me?"

"You would do well to stay inside."

"Um. Look, got anything to drink?"

Patil frowned. "Has the water pipe stopped giving?"

"No, I mean, you know--a drink. Gin and tonic, wasn't that what the Brits preferred?"

"Alcohol is the devil's urine," Patil said precisely.

"It won't scramble my brains."

"Who can be sure? The mind is a tentative instrument."

"You don't want any suspicion that I'm unreliable, that it?"

"No, of course not," Singh broke in anxiously.

"Needn't worry," Clay muttered. The heat below and the long hours of tedious work were wearing him down. "I'll be gone soon's I can get things wrapped up."

"You agree that we are seeing the decays?"

"Let's say things're looking better."

Clay had been holding back even tentative approval. He had expected some show of jubilation. Patil and Singh simply sat and stared into the flickering coals of the stove's half-open door.

Slowly Patil said, "Word will spread quickly."

"Soon as you transmit it on that dish, sure." Singh murmured, "Much shall change."

"Look, you might want to get out of here, go present a paper--"

"Oh no, we shall remain," Singh said quickly.

"Those devotees could give you trouble if they find--"

"We expect that this discovery, once understood, shall have great effects," Patil said solemnly. "I much prefer to witness them from my home country."

The cadence and mood of this conversation struck Clay as odd, but he put it down to the working conditions. Certainly they had sacrificed a great deal to build and run this experiment amid crippling desolation.

"This result will begin the final renunciation of the materialistic worldview," Singh said matter-of-factly.

"Huh?"

"In peering at the individual lives of mere particles, we employ the reductionist hammer," Patil explained. "But nature is not like a salamander, cut into fragments."

"Or if it were," Singh added, "once the salamander is so sliced, try to make it do its salamander walk again. A broad white grin split the gloom of nightfall."

"The world is an implicate order, Dr. Clay. All parts are hinged to each other."

Clay frowned. He vaguely remembered a theory of

quantum mechanics which used that term-"implicate order," meaning that a deeper realm of physical theory lay beneath the uncertainties of wave mechanics. Waves that took it into their heads to behave like particles, and the reverse--these were supposed to be illusions arising from our ignorance of a more profound theory. But there was no observable consequence of such notions, and to Clay such mumbo jumbo from theorists who never got their hands dirty was empty rhapsodizing. Still, he was supposed to be the diplomat here.

He gave a judicial nod. "Yeah, sure--but when the particles die, it'll all be gone, right?"

"Yes, in about 10^{34} years," Patil said. "But the *knowledge* of matter's mortality will spread as swiftly as light, on the wind of our transmitter."

"You are an experimentalist, Dr. Clay, and thus--if you will forgive my putting it so--addicted to cutting the salamander." Patil made a steeple of his fingers, sending spindly shadows rippling across his face. "The world we study is conditioned by our perceptions of it. The implied order is partially from our own design."

"Sure, quantum measurement, uncertainty principle, all that." Clay had sat through all the usual lectures about this stuff and didn't feel like doing so again. Not in a dusty shed with his stomach growling from hunger. He sipped at his cup of weak Darjeeling and yawned.

"Difficulties of measurement reflect underlying problems," Patil said.

"Even the Westerner Plato saw that we perceive only imperfect modes of the true, deeper world."

"What deeper world?" Clay sighed despite himself. "We do not know. We *cannot* know."

"Look, we make our measurements, we report. Period." Amused, Singh said, "And that is where matters end?"

Patil said, "Consensual reality, that is your 'real' world, Professor Clay. But our news may cause that bland, unthinking consensus to falter."

Clay shrugged. This sounded like late-night college bullshit sessions among boozed up science nerds. Patty-cake pantheism, quantum razzle-dazzle, garbage philosophy. It was one thing to be open-minded and another to let your brains fall out. Was everybody on this wrecked continent a boogabooga type? He had to get out.

"Look, I don't see what difference--"

"Until the curtain of seeming surety is swept away," Singh put in.

"Surety?"

"This world--this universe--has labored long under the illusion of its own permanence." Singh spread his hands, animated in the flickering yellow glow. "We might die, yes, the sun might even perish--but the universe went on. Now we prove otherwise. There cannot help but be profound reactions."

He thought he saw what they were driving at. "A Nobel Prize, even."

To his surprise, both men laughed merrily. "Oh no," Patil said, arching his eyebrows. "No such trifles are expected!"

The boxy meeting room beside the data bay was packed. From it came a subdued mutter, a fretwork of talk laced with anticipation.

Outside, someone had placed a small chalky statue of a grinning elephant. Clay hesitated, stroked it. Despite the heat of the mine, the elephant was cool.

"The workers just brought it down," Mrs. Buli explained with a smile. "Our Hindu god of auspicious beginnings."

"Or endings," Patil said behind her. "Equally."

Clay nodded and walked into the trapped, moist heat of the room. Everyone was jammed in, graduate students and laborers alike, their dhotis already showing sweaty crescents. Clay saw the three students the devotees had beaten and exchanged respectful bows with them.

Perceiving some need for ceremony, he opened with lengthy praise for the endless hours they had labored,

exclaiming over how startled the world would be to learn of such a facility. Then he plunged into consideration of each candidate event, his checks and counter-checks, vertex corrections, digital array flaws, mean free paths, ionization rates, the artful programming that deflected the myriad possible sources of error. He could feel tension rising in the room as he cast the events on the inch-thick wall screen, calling them forth from the files in his cubes. Some he threw into 3-D, to show the full path through the cage of iron that had captured the death rattle of infinity.

And at the end, all cases reviewed, he said quietly, "You have found it. The proton lifetime is very nearly 10^{34} years."

The room burst into applause, wide grins and wild shouts as everyone pressed forward to shake his hand.

Singh handled the message to the NSF. Clay also constructed a terse though detailed summary and sent it to the International Astronomical Union for release to the worldwide system of observatories and universities.

Clay knew this would give a vital assist to his career. With the Kolar team staying here, he would be their only spokesman. And this was very big, media-mesmerizing news indeed.

The result was important to physicists and astronomers alike, for the destiny of all their searches ultimately would be sealed by the faint failures of particles no eye would ever see. In 10^{34} years, far in the depths of space, the great celestial cities, the galaxies, would be ebbing. The last red stars would flicker, belch, and gutter out. Perhaps life would have clung to them and found a way to persist against the growing cold. Cluttered with the memorabilia of the ages, the islands of mute matter would turn at last to their final conqueror--not entropy's still hand, but this silent sputter of protons.

Clay thought of the headlines: UNIVERSE TO END. What would *that* do to harried commuters on their way to work?

He watched Singh send the stuttering messages via the big satellite dish, the corrugated tin roof of the shed

pulled aside, allowing him to watch burnt gold twilight seep across the sky. Clay felt no elation, as blank as a drained capacitor. He had gone into physics because of the sense it gave of grasping deep mysteries. He could look at bridges and trace the vectored stability that ruled them. When his daughter asked why the sky was blue, he actually knew, and could sketch out a simple answer. It had never occurred to him to fear flying, because he knew the Bernoulli equation for the pressure that held up the plane.

But this result...

Even the celebratory party that evening left him unmoved. Graduate students turned out in their best khaki. Sitar music swarmed through the scented air, ragas thumping and weaving. He found his body swaying to the refractions of tone and scale.

"It is a pity you cannot learn more of our country," Mrs. Buli remarked, watching him closely.

"Right now I'm mostly interested in sleep."

"Sleep is not always kind." She seemed wry and distant in the night's smudged humidity. "One of our ancient gods, Brahma, is said to sleep and we are what he dreams."

"In that case, for you folks maybe he's been having a nightmare lately."

"Ah yes, our troubles. But do not let them mislead you about India. They pass."

"I'm sure they will," Clay replied, dutifully diplomatic.

"You were surprised, were you not, at the outcome?" she said piercingly. "Uh, well, I had to be skeptical."

"Yes, for a scientist certainty is built on deep layers of doubt."

"Like my daddy said, in the retail business deal with everybody, but count your change."

She laughed. "We have given you a bargain, perhaps!"

He was acutely aware that his initial doubts must have been obvious. And what unsettled him now was not just the hard-won success here, but their strange attitude toward it.

The graduate students came then and tried to teach him a dance. He did a passable job and a student named Venkatraman slipped him a glass of beer, forbidden vice. It struck Clay as comic that the Indian government spent much energy to suppress alcohol but did little about the population explosion. The students all laughed when he made a complicated joke about booze, but he could not be sure whether they meant it. The music seemed quicken, his heart thumping to keep up with it. They addressed him as Clay, a term of respect, and asked his opinion of what they might do next with the experiment. He shrugged, thinking *'Nother job, sahib?* and suggested using it as a detector for neutrinos from supernovas. That had paid off when the earlier generation of neutrino detectors picked up the 1987 supernova.

The atom bomb, the 1987 event, now this--particle physics, he realized uncomfortably, was steeped in death. The sitar slid and rang, and Mrs. Buli made arch jokes to go with the spicy salad. Still, he turned in early.

To be awakened by a soft breeze. A brushing presence, sliding cloth... He sensed her sari as a luminous fog. Moonlight streaming through a lopsided window cast shimmering auras through the cloth as she loomed above him. Reached for him. Lightly flung away his sticky bedclothes.

A soft hand covered his mouth, bringing a heady savor of ripe earth. His senses ran out of him and into the surrounding dark, coiling in air as he took her weight. She was surprisingly light, though thick-waisted, her breasts like teacups compared with the full curves of her hips. His hands slid and pressed, finding a delightful slithering moisture all over her, a sheen of vibrancy. Her sari evaporated. The high planes of her face caught vagrant blades of moonlight, and he saw a curious tentative, expectant expression there as she wrapped him in soft pressures. Her mouth did not so much kiss his as enclose it, formulating an argument of sweet rivulets that trickled into his porous self. She slipped into place atop him, a slick clasp that melted him up into her, a perfect fit, slick with dark insistence.

He closed his eyes, but the glow diffused through his eyelids, and he could see her hair fanning through the air like motion underwater, her luxuriant weight bucking, trembling as her nails scratched his shoulders, musk rising smoky from them both. A silky muscle milked him at each heart-thump. Her velvet mass orbited above their fulcrum, bearing down with feathery demands, and he remembered brass icons, gaudy Indian posters, and felt above him Kali strumming in fevered darkness. She locked legs around him, squeezing him up into her surprisingly hard muscles, grinding, drawing forth, pushing back. She cried out with great heaves and lungfuls of the thickening air, mouth going slack beneath hooded eyes, and he shot sharply up into her, a convulsion that poured out all the knotted aches in him, delivering them into the tumbled steamy earth--

-and next, with no memories between, he was stumbling with her down a gully... beneath slanting silvery moonlight. "What--what's--"

"Quiet!" She shushed him like a schoolmadr.

He recognized the rolling countryside near the mine. Vague forms flitted in the distance. Wracked cries cut the night.

"The devotees," Mrs. Buli whispered as they stumbled on. "They have assaulted the mine entrance."

"How'd we--"

"You were difficult to rouse," she said with a sidelong glance.

Was she trying to be amusing? The sudden change from mysterious supercharged sensuality back to this clipped, formal professionalism disoriented him.

"Apparently some of our laborers had a grand party. It alerted the devotees to our presence, some say. I spoke to a laborer while you slept, however, who said that the devotees knew of your presence. They asked for you."

"Why me?"

"Something about your luggage and a telephone call home."

Clay gritted his teeth and followed her along a path

that led among the slumped hills, away from their lodgings. Soon the mine entrance was visible below. Running figures swarmed about it like black gnats. Ragged chants erupted from them. A *waarrk waarrk* sound came from the hangar, and it was some moments until Clay saw long chains of human bodies hanging from the rafters, swinging themselves in unison.

"They're pulling down the hangar," he whispered.

"I despair for what they have done inside."

He instinctively reached for her and felt the supple warmth he had embraced seemingly only moments before. She turned and gave him her mouth again.

"We--back there--why'd you come to me?"

"It was time. Even we feel the joy of release from order, Professor Clay."

"Well, sure ..." Clay felt illogically embarrassed, embracing a woman who still had the musk of the bed about her, yet who used his title. "But... how'd I get here? Seems like--"

"You were immersed. Taken out of yourself."

"Well, yeah, it was good, fine, but I can't remember anything."

She smiled. "The best moments leave no trace. That is a signature of the implicate order."

Clay breathed in the waxy air to help clear his head. More mumbo jumbo, he thought, delivered by her with an open, expectant expression. In the darkness it took a moment to register that she had fled down another path. "Where'll we go?" he gasped when he caught up.

"We must get to the vans. They are parked some kilometers away."

He hesitated a moment, then followed her. There was nothing irreplaceable. It certainly wasn't worth braving the mob below for the stuff.

They wound down through bare hillsides dominated by boulders. The sky rippled with heat lightning. Puffy clouds scurried quickly in from the west, great ivory flashes working among them. The ground surged slightly. "Earthquake?" he asked.

"There were some earlier, yes. Perhaps that has excited the devotees further tonight, put their feet to running."

There was no sign of the physics team. Pebbles squirted from beneath his boots--he wondered how he had managed to get them on without remembering it--and recalled again her hypnotic sensuality. Stones rattled away down into narrow dry washes on each side. Clouds blotted out the moonglow, and they had to pick their way along the trail.

Clay's mind spun with plans, speculations, jittery anxiety. Mrs. Buli was now his only link to the Western fragment of India, and he could scarcely see her her??? the shadows. She moved with liquid grace, her sari trailing, sandals slapping. Suddenly she crouched down. "More."

Along the path came figures bearing lanterns. They moved silently in the fitful silvery moonlight. There was no place to hide, and the party had already seen them.

"Stand still," she said. Again the crisp Western diction, yet her ample hips swayed slightly, reminding him of her deeper self.

Clay wished he had a club, a knife, anything. He made himself stand beside her, hands clenched. For once his blackness might be an advantage.

The devotees passed, eyes rapt. Clay had expected them to be singing or chanting mantras or rubbing beads--but not shambling forward as if to their doom. The column barely glanced at him. In his baggy cotton trousers and formless shirt, he hoped he was unremarkable. A woman passed nearby, apparently carrying something across her back. Clay blinked. Her hands were nailed to the ends of a beam, and she carried it proudly, palms bloody, half crucified. Her face was serene, eyes focused on the roiling sky. Behind her was a man bearing a plate. Clay thought the shambling figure carried marbles on the dish until he peered closer and saw an iris, and realized the entire plate was packed with eyeballs. He gasped and faces turned toward him. Then the man was gone along the path, and Clay waited, holding his breath against a gamy

stench he could not name. Some muttered to themselves, some carried religious artifacts, beads and statuettes and drapery, but none had the fervor of the devotees he had seen before. The ground trembled again.

And out of the dark air came a humming. Something struck a man in the line and he clutched at his throat, crying hoarsely. Clay leaped forward without thinking. He pulled the man's hands away. Lodged in the narrow of the throat was something like an enormous cockroach with fluttering wings. It had already embedded its head in the man. Spiky legs furiously scrabbled against the soiled skin to dig deeper. The man coughed and shouted weakly, as though the thing was already blocking his throat.

Clay grabbed its hind legs and pulled. The insect wriggled with surprising strength. He saw the hind stinger too late. The sharp point struck a hot jolt of pain into his thumb. Anger boiled in him. He held on despite the pain and yanked the thing free. It made a sucking sound coming out. He hissed with revulsion and violently threw it down the hillside.

The man stumbled, gasping, and then ran back down the path, never even looking at them. Mrs. Buli grabbed Clay, who was staggering around in a circle, shaking his hand. "I will cut it!" she cried.

He held still while she made a precise cross cut and drained the blood. "What... what was that?"

"A wasp-thing from the pouches that hang on our trees."

"Oh yeah. One of those bio tricks."

"They are still overhead."

Clay listened to the drone hanging over them. Another devotee shrieked and slapped the back of his neck. Clay numbly watched the man run away. His hand throbbed, but he could feel the effects ebbing. Mrs. Buli tore a strip from her sari and wrapped his thumb to quell the bleeding.

All this time, devotees streamed past them in the gloom. None took the slightest notice of Clay. Some spoke to themselves.

"Western science doesn't seem to bother 'em much now," Clay whispered wryly.

Mrs. Buli nodded. The last figure to pass was a woman who limped, sporting an arm that ended not in a hand but in a spoon, nailed to a stub of cork.

He followed Mrs. Buli into enveloping darkness. "Who were they?"

"I do not know. They spoke seldom and repeated the same words. Dharma and samsara, terms of destiny."

"They don't care about us?"

"They appear to sense a turning, a resolution." In the fitful moonglow her eyes were liquid puzzles.

"But they destroyed the experiment."

"I gather that knowledge of your Western presence was like the wasp-things. Irritating, but only a catalyst, not the cause."

"What *did* make them--"

"No time. Come."

They hurriedly entered a thin copse of spindly trees that lined a streambed. Dust stifled his nose and he breathed through his mouth. The clouds raced toward the horizon with unnatural speed, seeming to flee from the west. Trees swayed before an unfelt wind, twisting and reaching for the shifting sky.

"Weather," Mrs. Buli answered his questions. "Bad weather."

They came upon a small crackling fire. Figures crouched around it, and Clay made to go around, but Mrs. Buli walked straight toward it. Women squatted, poking sticks into flames. Clay saw that something moved on the sticks. A momentary shaft of moonlight showed the oily skin of snakes, tiny eyes crisp as crystals, the shafts poking from yawning white mouths that still moved. The women's faces of stretched yellow skin anxiously watched the blackening, sizzling snakes, turning them. The fire hissed as though raindrops fell upon it, but Clay felt nothing wet, just the dry rub of a fresh abrading wind. Smoke wrapped the women in gray wreaths, and Mrs. Buli hurried on.

So much, so fast. Clay felt rising in him a leaden

conviction born of all he had seen in this land. So many people, so much pain--how could it matter? The West assumed that the individual was important, the bedrock of all. That was why the obliterating events of the West's own history, like the Nazi Holocaust, by erasing humans in such numbing numbers, cast grave doubt on the significance of any one. India did something like that for him. Could a universe which produced so many bodies, so many minds in shadowed torment, care a whir about humanity? Endless, meaningless duplication of grinding pain . . .

A low mutter came on the wind, like a bass theme sounding up from the depths of a dusty well.

Mrs. Buli called out something he could not understand. She began running, and Clay hastened to follow. If he lost her in these shadows, he could lose all connection.

Quickly they left the trees and crossed a grassy field rutted by ancient agriculture and prickly with weeds. On this flat plain he could see that the whole sky worked with twisted light, a colossal electrical discharge leathering into more branches than a gnarled tree. The anxious clouds caught blue and burnt-yellow pulses and seemed to relay them, like the countless transformers and capacitors and voltage drops that made a worldwide communications net, carrying staccato messages laced with crackling punctuations. "The vans," she panted.

Three brown vans crouched beneath a canopy of thin trees, further concealed beneath khaki tents that blended in with the dusty fields. Mrs. Buli yanked open the door of the first one. Her fingers fumbled at the ignition. "The key must be concealed," she said quickly.

"Why?" he gasped, throat raw.

"They are to be always with the vans."

"Uh-huh. Check the others."

She hurried away. Clay got down on his knees, feeling the lip of the van's undercarriage. The ground seemed to heave with inner heat, dry and rasping, the pulse of the planet. He finished one side of the van and crawled under, feeling along the rear axle. He heard a

distant plaintive cry, as eerie and forlorn as the call of a bird lost in fog. "Clay? None in the others."

His hand touched a small slick box high up on the axle. He plucked it from its magnetic grip and rolled out from under.

"If we drive toward the mine," she said, "we can perhaps find others."

"Others, hell. Most likely we'll run into devotees."

Figures in the trees. Flitting, silent, quick.

"But--"

He pushed her in and tried to start the van. Running shapes in the field. He got the engine started on the third try and gunned it. They growled away. Something hard shattered the back window into a spiderweb, but then Clay swerved several times and nothing more hit them.

After a few minutes his heart-thumps slowed, and he turned on the headlights to make out the road. The curves were sandy and he did not want to get stuck. He stamped on the gas.

Suddenly great washes of amber light streamed across the sky, pale lances cutting the clouds. "My God, what's happening?"

"It is more than weather."

Her calm, abstracted voice made him glance across the seat. "No kidding."

"No earthquake could have collateral effects of this order."

He saw by the dashboard lights that she wore a lapis lazuli necklace. He had felt it when she came to him, and now its deep blues seemed like the only note of color in the deepening folds of night. "It must be something far more profound."

"What?"

The road now arched straight through a tangled terrain of warped trees and oddly shaped boulders. Something rattled against the windshield like hail, but Clay could see nothing.

"We have always argued, some of us, that the central dictate of quantum mechanics is the

interconnected nature of the observer and the observed."

The precise, detached lecturer style again drew his eyes to her. Shadowed, her face gave away no secrets.

"We always filter the world," she said with dreamy momentum, "and yet are linked to it. How much of what we see is in fact taught us, by our bodies, or by the consensus reality that society trains us to see, even before we can speak for ourselves?"

"Look, that sky isn't some problem with my eyes. It's *real*. Hear that?" Something big and soft had struck the door of the van, rocking it.

"And we here have finished the program of materialistic science, have we not? We flattered the West by taking it seriously. As did the devotees."

Clay grinned despite himself. It was hard to feel flattered when you were fleeing for your life.

Mrs. Buli stretched lazily, as though relaxing into the clasp of the moist night. "So we have proven the passing nature of matter. What fresh forces does that bring into play?"

"Huh!" Clay spat back angrily. "Look here, we just sent word out, reported the result. How--"

"So that by now millions, perhaps billions of people know that the very stones that support them must pass."

"So what? Just some theoretical point about subnuclear physics, how's that going to--"

"Who is to say? What avatar? The point is that we were believed. Certain knowledge, universally correlated, surely has some impact--"

The van lurched. Suddenly they jounced and slammed along the smooth roadway. A bright plume of sparks shot up behind them, brimming firefly yellow in the night.

"Axle's busted!" Clay cried. He got the van stopped. In the sudden silence, it registered that the motor had gone dead.

They climbed out. Insects buzzed and hummed in the hazy gloom. The roadway was still straight and

sure, but on all sides great blobs of iridescent water swelled up from the ground, making colossal drops. The trembling half-spheres wobbled in the frayed moonlight. Silently, softly, the bulbs began to detach from the ^{foggy} ground and gently loft upward. Feathery luminescent clouds above gathered on swift winds that sheared their edges. These billowing, luxuriant banks snagged the huge teardrop shapes as they plunged skyward.

"I . . . I don't. . ."

Mrs. Buli turned and embraced him. Her moist mouth opened a redolent interior continent to him, teeming and blackly bountiful, and he had to resist falling inward, a tumbling silvery bubble in a dark chasm.

"The category of perfect roundness is fading," she said calmly.

Clay looked at the van. The wheels had become ellipses. At each revolution they had slammed the axles into the roadway, leaving behind long scratches of rough tar. He took a step.

She said, "Since we can walk, the principle of pivot and lever, of muscles pulling bones, survives."

"How... this doesn't..."

"But do our bodies depend on roundness? I wonder." She carefully lay down on the blacktop.

The road straightened precisely, like joints in an aged spine popping as they realigned.

Angles cut their spaces razor-sharp, like axioms from Euclid. Clouds merged, forming copious tinkling hexagons.

"It is good to see that some features remain. Perhaps these are indeed the underlying Platonic beauties."

"What?" Clay cried.

"The undying forms," Mrs. Buli said abstractly. "Perhaps that one Western idea was correct after all."

Clay desperately grasped the van. He jerked his arm back when the metal skin began flexing and reshaping itself.

Smooth glistening forms began to emerge from the rough, coarse earth. Above the riotous, heaving land

the moon was now a brassy cube. Across its face played enormous black cracks like mad lightning.

Somewhere far away his wife and daughter were in this, too. *G'bye, Daddy. It's been real.*

Quietly the land began to rain upward. Globbs dripped toward the pewter, filmy continent swarming freshly above. Eons measured out the evaporation of ancient sluggish seas.

His throat struggled against torpid air. "Is ... Brahma ... ?"

"Awakening?" came her hollow voice, like an echo from a distant gorge.

"What happens... to... us?"

His words diffracted away from him. He could now see acoustic waves, wedges of compressed, mute atoms crowding in the exuberant air. Luxuriant, inexhaustible riches burst from beneath the ceramic certainties he had known.

"Come." Her voice seeped through the churning ruby air.

Centuries melted between them as he turned. A being he recognized without conscious thought spun in liquid air.

Femina, she was now, and she drifted on the new wafting currents. He and she were made of shifting geometric elements, molecular units of shape and firm thrust. A wan joy spread through him.

Time that was no time did not pass, and he and she and the impacted forces between them were pinned to the forever moment that cascaded through them, all of them, the billions of atomized elements that made them, all, forever.