

Silver Specter

by
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An occasional spur of powdery iron silicates
Humping through the gravitic field
Screeching against the bottom of the sand scow
Yawing her slightly then straightening-out

"Oooff! I'd better get my foot hooked in the strap or I'm going over the side." While muttering in his helmet, Clive was letting the main sheet out a few centimeters and trimming in the jib.

With the shift in the rigging, the holo display underwent a series of flickering changes on the port side. This confirmed Clive's hypothetical instrumentation layout of the speed on the left, but he still couldn't read it. The display on the right was clearly the navigational plot, with the circle in the center representing the dome and the polar coordinate grid radiating out from it like a spider's web. The scow's position was obviously the moving red dot, but the meaning of the graphics icon in the center circle still escaped him. On the first leg it was a spiral, but with the tack it had changed to a line drawing of an insect or spider.

Not as fast as his first leg when he was a little further off the wind, but about 60 knots now and almost into the wind. It was definitely the tightest tack he had ever made. He grinned and settled back against the safety harness.

~ ~ ~

Eleven years ago, Bob Prosky had sat staring fixedly at the screen display being sent from the Mars surface by the B-4 Rover. It was an excellent, high-resolution picture, showing incredibly minute detail, and it bored him unbearably. As the Command Engineer for the B-4 Rover, he took his turn on the visual monitor four out of every twenty-four hours. He had seen endless volumes of dust, sand, gravel, and rock. He had never seen anything else, not even a new or interesting geological formation. All of those had been discovered in the first few years of the Mars Orbiting Laboratory's rover explorations of the surface.

As he sat there in the trance that usually overtook him in the fourth hour of his watch, the rover topped the last obscuring dune on its way to get close-up shots of the strange formation photographed by the new Orbiting Digital Data Mapping and Navigation camera. ODDMAN's pictures looked like there was a needle sticking out of a mound of sand, probably a lava pipe slowly wearing down in the ceaseless Martian sandblast. Like all unique geological formations, samples were the order of the day, and the B-4 rolled in to take them.

The pictures coming in from B-4 were as clear and sharp as ever, and as it got closer to its target, Bob realized he was not looking at a unique geological formation. It was definitely a huge needle sticking up through a mound of sand.

Bob sat stunned, staring at the screen with a glazed look on his eyes. His brain and his eyes were in conflict, and his body would no doubt have resolved the conflict by slipping him into shock if the rover's camera hadn't been blocked by a rock outcropping. The red Command Request light blinked steadily on the control console.

His first "My God!" was a mere croak, but they followed in rapid succession and in a crescendo until the Duty Officer, who had been yelling to no avail, grabbed him by both shoulders and shook. Bob looked up and swallowed as if about to speak, but pointed instead to the screen. The Duty Officer saw what looked like sand smoothed rock filling the entire screen. He looked back at Bob.

Bob pointed to the blinking console light and found his voice. "It's not a chimney rock. It's smooth metal, machined, and tapering to a point. It's just around that rock. Hold on while I get B-4 back on track."

Three minutes later, the Operations Room engineers and officers were clustered around the screen which showed an even closer shot of the needle. It stood about fifteen meters above the top of the dune, about a meter in diameter at the base, tapering to a small rounded point. The low sun made the left side a silver sliver.

~ ~ ~

The thin fast wind quartering in
Its gritty riders eating at the steel rigging
Frosting the vision through Clive's helmet
Rushing from cold heavy night
To hot light day

The wind still seemed to be gaining velocity as the Martian dawn approached Clive from astern. With the nearing of the terminator, the winds were whipping faster and faster out of the cold Martian night into the rapidly heating daylight - expanding and rising. The same phenomenon as the off-shore breeze Clive knew so well, except there was no "off" in this breeze. It was all "shore."

Clive leaned sharply into the wind, shifting his cramped legs, looking for better bracing for his feet. His wind slicker over his pressure suit plastered to him on the windward side, fluttering rapidly behind like a vibrator up his back and down the backs of his arms. It was a good thing the Martian atmosphere was so thin, or he would have been blown away by the wind speeds he was sailing in.

Clive blinked. He had felt the beginnings of a headache for quite awhile now, and he suddenly realized why. He was squinting hard, straining to spot spurs or quick hummocks of sand ahead. It was getting harder and harder to see.

He wiped his hand across his face plate with no effect. As the wind increased, more sand was suspended in the thin breeze. It was sandblasting the scow, the rigging, and Clive's faceplate.

To Clive, it was still like he was dreaming. The sand scow was too fantastic, too much like magic to be real; Clarke's Rule in action. The engineers had found the same black-box, power receiving unit other devices had been found with, but its output was decidedly different. They couldn't tell you exactly how it differed, or how much it differed, just that it differed. They knew that at least part of the output was a gravitic field, but within their concept of physics, while there was room for the existence of such a field, there was no mechanism or solid concept for how or why it worked.

Clive had had fun teasing the engineers, trying to get them to admit it was more like magic than science. They hadn't of course, but Clive had detected that after studying it for the last six weeks, some of them were now trying theories they would have originally classed as occult.

~ ~ ~

When the excavation had begun at the base of the spire, no one had the slightest idea what they would find. Certainly, no one had speculated on a scale grand enough to encompass the magnitude of what lay buried under the dune. Bob Prosky had been as unimaginative as any of them, but his eagerness to participate first-hand and probably the fact that he was the first human to see the needle had gotten him a slot on the engineering team and down on the surface when Excavation Base was established.

The early excavation work had been painfully slow for the orbiting crew. Rovers and even prospecting robots were not capable of efficient sand removal, at least not in the quantities required. As the work went on month-after-month, meter-after-meter of the smooth surface of the needle was exposed.

Near the end of the eighth month, one hundred meters were exposed and the needle was almost forgotten in the excitement of exposing what appeared to be the top of a dome that joined the spire at its apex. In the next month, more than a hectare of dome was uncovered, but short of explosives, nothing that was available to the rovers and robots could force an entry. No one seriously considered using explosives, so a landing team was in order.

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Bob Prosky was a metallurgical engineer practicing outside of his studied field as most engineers seemed to do, but his knowledge wasn't restricted to books. He had grown up in his

father's custom truck shop in the suburbs of Charlotte, North Carolina. He was intimate with every kind of cutting and welding tool used on earth before he went into space, and then, with great delight, became proficient with all the cutting and welding tools designed for the different environment of space. And because he was known to be the best, he got the honors to try the first high-power cut on the dome, even though he was an officer. He pulled his external shield down and fired-up the laser on low power. A satisfactory groove began to work its way across the two inch thick slab of chrome-moly machine stock he had in front of him as his test specimen.

"What was the drain on the converter, Rosie?"

About five to six percent. You're going to have more power than the laser can use, just like I told you. If you want to worry, worry about melting the torch."

The laser torch was the universal cutting and welding tool in space. Changing the focus and power switched it from cutting to welding in the hands of a skilled technician. In the vacuum of space, the techniques were very similar to the old oxy-acetylene burning and welding methods. Bob had this one focused as tightly as possible.

He was inside the sealed airlock that had been adhesively attached to the outside of the dome. Every kind of non-destructive test in the space engineering arsenal had been run on the dome and its contents. They had determined that there was an over-pressure of about one atmosphere inside the dome, but they did not know the gaseous composition. The standing orders from MOL Control, Earthside, were not to disturb anything until the exploration team got to Mars, and that included the atmosphere inside the dome.

Bob cranked the power up on the torch and started to cut. Once they determined that dome material was a metal, even though it was translucent, he had run the metallurgical tests himself. Visible and infrared light transmission through the metal was very good, even though it was optically poor. As a metal, it was nothing exceptional, but it was a little strange in terms of the trace elements it contained. There was nothing unusual enough about the chemical composition of the basically aluminum alloy that would explain its light transmission qualities, but its structure was a marvel. The metal was a more uniform crystalline structure than anything produced so far in the space labs, except for mono-crystals. It was hard, tough, and it let the light in. The perfect dome for a . . . city?

Bob cranked the power up again on the torch and went back over his previous cut. On full power and on his fifth re-cut, he saw the blow-back puff of gaseous compounds he had been creating in the intense heat at the laser's tip. "I'm through. I just saw her puff. I'm going to cut through all the way down on the left side, then the right side."

Bob completed the cut down the right side and attached the vacuum-lift cups to the cut-out section. The electric winch hung from a clip on the airlock above and behind him whirled around soundlessly as he brought up the tension on the lift cable. He went to work on the top, first and then the bottom. Bob left about an inch of metal on the left side of the bottom cut and about the same on the right. He picked up the hammer and steel wedges he had brought in with him and drove one in near each of the metal tags he had left, an old trick his dad had taught him. Without the wedges, the weight of the door would have crushed the molten metal and re-welded it just before the last of the tag was being cut through.

The top of the would-be door sagged slightly in against the cable and lifting cups as he cut through the tags. "Finished. I'm laying the door down." Bob spoke while he was working the controls of the winch. The top of the door moved slowly back until it was balanced on its bottom edge and then flopped over to put its weight again on the cable as it was lowered to the ground. The camera beside the winch caught his eye as its lens moved out to zoom in on the interior of the dome. Bob stuck his head in the opening to get his own view.

Just as he had expected, a city of sorts. Of course, the speculations had run the gamut of alien possibilities, but the majority, like Bob, expected some sort of city under glass. Bob estimated they were still about thirty meters above the ground level inside the dome, and much of his view was blocked by a large building just to the right of the airlock door he had just cut. He was startled by the touch on his shoulder as the exploration team commander motioned him aside. The first team

was lined up outside the lock as he went out carrying his torch. They all looked eager and nervous inside their suits. Bob waved and smiled at them. They ignored him.

~ ~ ~

The rudder hisses into the sand
As she comes about to her last and downwind leg

The first course change was easy, from a close port tack to a close starboard tack. Clive had put the tiller all the way over, and the scow had come about, slowly, like some of the more poorly balanced boats he had sailed, but it had come about. This time he had to come way around, almost doubling back on himself. Every minute on board the scow he felt more confident, more in tune with the hull and her rigging and the thin wind driving her silvery sails. He would use the full rudder. He still wasn't sure how it worked, but it had an increasingly greater effect on the steering direction as it was lowered into the sand. A much faster effect change than any increased friction would explain, if there had been any apparent friction on the rudder in the sand to start with, which there wasn't for some reason he hadn't yet figured out.

Clive un-cleated the main sheet and held it in his right hand. His left hand pulled the tiller up and toward him, driving the rudder blade into the sand.

The scow responded instantly. Clive felt his feet come up hard against the toe strap and the upper part of his body hinge backward, trying to move tangentially to the turn, until it snubbed on the safety harness, the straps cutting across his back.

~ ~ ~

Clive's interest in mankind's outward urge got started when he was only thirteen. As a science project he built a model of the moon base, which was then under construction, and he wrote a paper depicting the daily routine of the scientists who would man the base.

He was hooked. Right from the beginning he found that every topic he explored led his interest to two or three new topics with no end to the chain. All through high school he devoured all the books, magazine articles, and holovids he could lay his hands on. He was insatiable, mesmerized by the glamour of space hardware and adventure. He knew it was the life for him, and he drove toward it relentlessly—until his senior year in high school.

Clive had no trouble getting accepted at the National Space Sciences Academy since he was at the top of his class and had scored ninety-seven percentile on the entrance exams, but he couldn't get the curriculum he wanted. Almost every day of his high school years he had at least once drifted off on a vision that included him seated at the controls of a true space vehicle, but he had failed the physical.

Mother Nature had given Clive's ambition a kick in the groin at the same time she had given him the capabilities that made him the captain of the basketball team. Although he had practiced slumping almost round-the-clock for two months before his physical, he hadn't been able to make it under the six-four maximum. For the next six months, until college started, Clive was a classic manic-depressive. He swung rapidly and without apparent cause from "Who needs college anyway?" to "I'll be so good the first year they'll have to make an exception in my case."

And he was, but they didn't. However, he did succeed in working himself into a mellower attitude and a more rational plan. He decided to specialize in a science that would at least get him out of the gravity-well in which he was born. First it was a B.S. in Human Engineering, then an M.S. in Social Psychology, and finally a Ph.D. in Gestalt Psychology with a thesis on "The Social Dynamic Limits of Earth Dependent Space Colonies." Not exactly a best seller, but it created quite a stir in a narrow stream of academia.

Even though he traveled only as a passenger, space was magnificent, as he had known it would be, and life in the L5G colony made Clive feel he had grown up in a foreign country and had finally come home. But Clive's satisfaction with finally reaching space was short-lived. Two years after

settling into colony life, the spire was discovered on Mars, and Clive became as restless as before but this time with the specific objective of Mars. Clive built a sound scientific case for his presence at the excavation and presented it boldly to any minor or major bureaucrats that could have even the slightest influence on his selection for the excavation team—if he could get them to listen to him at all. He also pulled any strings he could find; he schemed, cajoled, pleaded, and begged, but without success.

The expedition seemed to make new discoveries every day that were covered in great detail by the news media. The buildings were filled with artifacts of all types; some were easy to functionally label, some could only be labeled decorative, and some were totally baffling. There were fixtures, walls, and ceilings obviously designed to provide light, although none were functioning. There were assorted pieces of metal and ceramic furniture, glass and ceramic drinking vessels, and miscellaneous pieces of what appeared to be electro-mechanical equipment of unknown purpose. But there were no biological remains or representational sculptures in the buildings that could provide physical information about the original inhabitants of the city.

One thing did become clear during the first few months of exploration, even to the engineers that were forced to play archaeologists while waiting for the Mars Expeditionary Team to be assembled on Earth and ferried to Mars. The size of rooms, hallways, and doors; the juxtaposition and shape of the extant furniture; the use of steps in the architectural design; the nature of what were apparently controls on the non-functioning electro-mechanical devices; and hundreds of other little things that normally go unnoticed but, when analyzed, can produce a startling number of facts about the creatures they were designed to serve; all clearly indicated a biological structure similar to man's. They were definitely bipedal with an average height of a little more than a meter and a half. They also had at least one set of upper torso manipulative limbs containing from three to six digits each and were probably very humanoid in appearance.

Even after the Mars Expeditionary Team had been on the scene for more than a year, the public was still not saturated with the unfolding story and the mystery of the Martian city. As the archaeological team dug deeper into the city, more and more technical items were discovered whose operations defied analysis. One of the more mysterious discoveries was a large warehouse-like structure under the northern edge of the dome with large doors opening to the outside. Inside the structure were orderly rows of flat, metal, ellipsoids about three by seven meters in width and length, and about fifteen centimeters thick, each resting in its own cradle-like support structure. Lying between and on top of the ellipsoids was a jumble of oval and round tubing of various sizes and lengths, none of which were attached to each other, the ellipsoids, or anything else. The archaeologists were baffled, and the engineers were able to come up with only one plausible theory after a month of study.

Grant Zimmer was the engineer that put the hypothesis together. He was young, eager, aggressive, all the things it would be easy to hate him for if he hadn't also been a charmer of the old school. That is, he charmed you genuinely, without conscious effort, and you liked it even though you knew you were being charmed. But charm hadn't gotten him his reputation at the excavation. He was bright and creative, and he had already amassed an enviable record of intuitive explanations for many of the city's mysteries when he hypothesized that the structure was a receiving warehouse and the ellipsoids were some sort of automated cargo pallets that were perhaps carried on a large, wheeled transporter. The assorted tubes could be some sort of handling gear or dunnage placed between items of cargo. The regularly spaced holes and slots scattered over the ellipsoids could have been for tie-down fittings. It was a pretty tight explanation, but the lack of a transporter, any cargo, or even a cargo container of any sort left as many skeptics as believers.

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With a rattle and flutter of shifting rigging
And the clatter of Clive's efforts to unfurl her spinnaker
Shuddering forward as it billows into place

He almost lost it. If it hadn't been for the scow's amazing steering system, he would have, but as soon as he had been thrown to the limits of his safety line and lost his grip on the tiller, it moved smoothly back to an amidships position and lifted the blade out of the sand. He had gone a little too far around though and in the excitement had pulled the sheet in even farther with his right hand. The collective errors resulted in a smooth but unplanned jibe. With luck, no one at the base camp noticed.

Clive eased the tiller over to bring the scow back on course and let the main sheet run through his fingers until the boom was almost at a right angle with the course. He pulled the sheet into the cleat slot and moved forward sliding his left hand along the lifeline from stanchion to stanchion. Leaning against the mast for stability, Clive pulled the jib halyard out of its cleat slot and gathered the sail with his right hand and foot as it descended. When he had the sail bundled under his foot, he stuffed it into the small sail bag secured to the foredeck.

Beside this bag was a larger one, and Clive fished the head of the spinnaker out and snapped the halyard in. He slipped the spinnaker pole out from its deck clamps and hooked it to the sail's clew and the fitting he had improvised on the mast.

Glancing back to check the slack he had estimated for the sheets, he hoisted the fluttering spinnaker. About two thirds of the way up it popped open and Clive could feel the sensitive little scow surge forward. He scampered aft to trim it up.

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Grant Zimmer had come to the Mars Expeditionary Team as its most junior member, only three years out of the academy. The next youngest member of the team was nine years his senior, and Grant frequently referred to himself as the "token youth." But despite his youth, or perhaps because of it, he contributed a sizable portion of imagination to the team's efforts to understand the workings of the city.

And work it did. The city was still powered, and the spire appeared to serve as an antenna for broadcasting that power throughout the city. Numerous electronic devices in the buildings still functioned with no apparent power connection, but mechanical devices would not work at all or would work poorly one or two times and stop. Grant was contemplating the latest piece of machinery to run noisily for a short while and then stop. There was little doubt about what this piece of machinery was, but no one had a clear idea what purpose it served in a systems sense. It was a vortex fan with cold and hot air bleeds that were piped off into the closed overhead to some mysterious other place. The machine had been carefully instrumented, turned on, and dutifully recorded as it died.

Grant rubbed his nose as he stared at the fan. He was alone now that the big guys had lost interest with just one more failure. They had been sampling the machinery for about three months now and failure was getting boring. Grant looked around to make sure he was alone, and picked up a wrench. He knew he was not supposed to take anything apart until the whole test program was complete, three more months, but Bob Prosky's offhand remark that last week's failure sounded like an aqua-ski engine he had when he was a teenager still buzzed around in his head. He said it ate its bearings when the engine over-reved while airborne in the surf.

The phrase "ate its bearings" kept reverberating in his mind. Grant removed the bolts to what looked like a faceplate, and carefully eased it back on the shaft. Right in front of him was a split bearing housing on the shaft, with a bearing housing that was a mess. Where the shaft went through, it looked like someone had taken a drill and wobbled it around in the hole to chew out a larger diameter. He hadn't been zapped by any strange current or fields that he could feel, so he decided to press his luck.

After he had carefully replaced the face plate on the damaged fan, Grant moved to the fan that appeared to be identical right beside it and removed its faceplate. There was the split bearing housing, but it appeared undamaged. He fumbled in the tool box for the right size wrench, the

standard hex shape but one of the regular screwy sizes found in the city, and removed the top half of the bearing housing.

There was no bearing, just the housing which had about a millimeter or two of play around the shaft. Obviously, whatever the bearing surface was originally, it no longer existed. He carefully replaced the bearing housing and the faceplate on the second fan, and went back to his quarters to think. He didn't tell anyone that he had broken the disassembly rule, not then or ever. He did, however, put forth a very plausible theory that the bearings for the machinery must have been an advanced organic material like a high-temperature, high-pressure fluorocarbon that had deteriorated completely over the thousands of years since the machinery was last run.

Special tests were devised to collect data on Grant's theory during the next two machinery tests. Chances were, Grant was right and the Chief Engineer decided to accelerate the disassembly program to avoid further damage to the city's machinery by running it without bearings. Grant was the toast of the Base Camp for the next two weeks, along with Bob Prosky, whom Grant loudly proclaimed as the real inventor of the theory.

With the proof of Grant and Bob's bearing theory, the machinery of the city was quiet while the engineering community raced to design new bearings for one piece of machinery after another. With the limited machining capabilities of the base camp and orbiter, only simple polymer and metal full-friction bearings could be made. This was obviously good enough for some of the smaller, light-load machinery, but not the big stuff. A steady stream of bearing specifications and orders went out to L3B for the next Mars mission supply ship to deliver. The engineers were overjoyed. If they could get all this exotic machinery to work, they had an excellent chance of determining its system relationships and its probable purpose.

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Clive was fascinated by the huge room full of ellipsoids. He knew he had the answer to the mystery as soon as he had seen it on the evening news, but he just couldn't quite drag it down into his conscious mind.

He ordered all the data disks and holovids on the ellipsoid discovery and went to work. For half a month's salary he had the ellipsoid data and holos converted to a machine program and a one-tenth scale, poly model produced, including an assortment of tubes and rods. While you could see every detail of the ellipsoid with the holos, and the tactile experience seemed to add another dimension, it wasn't enough to stimulate any intuitive leap on Clive's part.

Clive programmed his homeputer to project a slowly rotating hologram of the ellipsoid in his bedroom along with his wake-up music each morning. For the first ten minutes of each day, which Clive felt was his most creative period, he would immerse himself in the ellipsoid mystery.

Uncreative period or not, it was about eleven-thirty in the evening when it all came together for Clive. He was watching the late news holovid from Mars where the science commentator was excitedly describing the discovery and theory of the junior engineer on the expedition concerning bearings.

Clive didn't wait to hear it all, he had it. He raced to the study, picked up the ellipsoid model, and took a whole new look at it. While the first impression of the ellipsoid was one of uniformity and smoothness, in actuality it had numerous small depressions, grooves, slots, and holes. Clive, like everyone else, had rejected the idea that the tubes were somehow an integral part of the ellipsoids because none of the depressions or holes matched the diameters of the rods and tubes. But if you allowed for bearings . . .

Clive grabbed a handful of tubes and rods and placed them randomly on the various bosses and in the several depressions. In less than two minutes, he had confirmed his theory.

Being basically a loner, Clive had spent a great deal of his teenage summers in a little sloop off Nantucket. While he wasn't sure how it all went together yet, he knew that the rods and tubes were part of the rigging and the ellipsoid was the hull. Obviously there had once been a lake or a sea at

the edge of the city. Actually, he told himself, he should have known without the bearing clue. The oval shaped tubes should have been enough.

~ ~ ~

With the same taut snap as Clive's little sloop in Nantucket
But gobbling kilometers under her frictionless hull

Clive finished trimming the spinnaker and shifted his examination to the main. Makeshift or not, the computer had cut him a pretty fair set of sails from the data he had requested on the earth-link. It might not be the best rig for the Martian scows, but he was pleased with it.

Actually, the success of the sails was more the product of Grant Zimmer than the cutting equations. Grant spent two weeks modifying the surveying laser to cut and weld the sails, while Clive scavenged materials and laid out the rest of the rigging. That included designing the dies so the sail tracks could be extruded from the plastic stocks in the shop.

Clive noted that the icon in the navigation plot holo had changed again with the last course change. This time it looked like some kind of animal, a highly stylized dog or cat.

~ ~ ~

Clive could see the top of the spire as the ATV crested the hill separating the shuttle landing area from the city. All eight passengers in the bus were craning their necks to see the partially exposed dome covering the 10,000 year old city below them. The morning sun glinted dully off the spire and made a moonlike crescent of the dome.

Clive was finally on Mars, bouncing around and over the excavation spoil with seven other new members of the Mars Expeditionary Team. After so many months of failing to get anyone's attention, it was amazing how many offices were opened and hands were extended when he solved the ellipsoid riddle. In a week's time he had received an official invitation to join the Mars team from the program manager at the International Space Agency in Lima, Earth. Within the month, he had been outward bound.

Rocking along beside Clive was Janet Fionelli, a molecular biologist, whom Clive had gotten to know on the long months out. In all, there were twenty-seven new team members and five crew on the ship, all of whom seemed to enjoy each other's company for the first two weeks of the trip. For the next four months, there were sporadic pairs, short-lived cliques, a few short tempers and mostly, unrelieved boredom. Clive was familiar with the classic cycle of depression that had gripped the ship—inactivity, caused by disinterest, caused by anticipation, resulting in boredom, and reinforcing inactivity. Clive and Janet had been one of the sporadic pairs, but neither the understanding of the situation nor the sporadic pairing could cut through Clive's fog of boredom and lethargy.

"We're here, Clive. In less than an hour I should have a real section of fossilized plant in my hands. No more holos."

"And I'll have a handful of attenuated psycho-magnetic fluctuations, a city full of results with no known causes, and a cultural end with no apparent beginning. No wonder you scientists still resist accepting us as more than artisans."

The undulations of the bus suddenly smoothed, and both Clive and Janet again turned their attention to the window. They had rolled through one of the several sets of roadway doors through the dome and were on an ancient city street, wide and still smooth. The buildings rose on both sides, some more than 200 meters.

The architecture of the city was a sharp counterpoint of asymmetry to the dome and central spire, with the ceramic faces of the buildings flowing, curving, folding, and spanning. Each building was like the stark, simple beauty of a Brancusi sculpture and, somehow, managed to complement the adjacent buildings and the rest of the city no matter what angle of view you assumed.

The bus slowed as it moved into an open area near the center of the city. A carefully executed, but hand lettered, sign sat atop a two meter spear of plastic pipe, "Machu Picchu Park." They rolled

slowly toward an out-of-place looking, standard polydome. Several other busses and an assortment of earth-moving equipment ringed the dome. Each was connected to the polydome by extendible airlock, and shortly after stopping, Clive could feel the same connection being made with the bus.

"Okay, Janet, let's do it." Clive levered himself up by the seat back in front of him and started shuffling with the group toward the front of the bus. As he passed the luggage rack, he pulled his two personal duffels off and glanced behind him to make sure Janet had her luggage under control. They moved down the slight incline of the airlock snout and into the well-lit interior of the dome, only to wait in the usual queue.

Clive finally arrived at the head of the line, smiled twice, signed his name six times, gave four affirmative grunts, accepted a fistful of paper, and moved to a chair along the wall to examine the documents and figure out his next move. Unlike all the other new team members he had observed, there was no member of his department waiting to conduct him to his quarters in the department offices, and introduce him to all of his new associates, but for good reason. There was no Psychology Department nor anyone else on Mars trained in that discipline. The closest you could get to psychologists on the team were the archaeologists, some of whom were heavy in sociology, and the expedition's top brass, who had enough of the basics to deal with a closed society of some four hundred diverse personalities.

With the base map in hand, the only usable document he could discover in the fistful of paper, Clive had no trouble finding his two by four meter cubicle. He dumped his bag and his body on the bunk, it was too small to qualify as a bed, and opened the map again.

~ ~ ~

Closing on the base camp

A line of electron-fluorescence her herald

Teeth clenched against the headache he had forgotten, Clive strained to see in the fading twilight. He could see out of the corner of his eye that the speed indicator had stopped its steady flicker, indicating that his speed had stabilized after the rigging change for the new heading, and he made a mental note to leave his suit transmitter hooked-up on his next sail so he could calibrate his radar speed readout from the north base camp with the Martian digits on the speed indicator. His guess was that he was making about ten knots less than the last leg.

~ ~ ~

Clive had little difficulty finding the big boathouse through the combined radial and concentric street layout of the city. When he had entered the city from the landing base he had passed right by the boathouse without knowing it. He walked randomly through the maze of hulls in their cradles, touching, looking, trying to keep all his senses open but focused on the boats. He was startled by the voice not three meters to his left.

"Hello. I don't think I've seen you around before. Are you one of the group in today?"

"Yeah. Fresh this morning. I'm Clive Church." He stuck out his hand.

"Oh. Sorry. I'm Grant Zimmer. I was supposed to meet you at the check-in, but I forgot about it until just now." Grant grabbed Clive's hand and gave him a genuinely-glad-to-see-you smile.

"Well, I'm glad to meet you. It was your organic bearing theory that gave me the last piece of the ellipsoid puzzle."

Grant's face shifted to a genuinely-eager-to-help smile. "With a little bit of luck, I might be able to help you solve a few more of the puzzles surrounding the boats. I've been fussing around with them for the last six months, since your solution, and, while I admit that I don't know much about boats, I've found a few more interesting things which I've been speculating on. In a small room off to the side over there, I found a stack of what look like rudders, and today I have a new piece I want to try in the puzzle. You know the slot just off center, beside the slight twenty centimeter square depression?"

As he talked, Grant moved to the hull beside Clive and pointed to the slot he had in mind. Turning toward Clive, he unbuttoned the left pocket of his shirt and pulled out a thin piece of metal about four by ten centimeters.

"This little jewel was found four days ago in one of the little carts the city people obviously used to move about. It was the first cart we've found that would turn on. Of course it wouldn't run without any bearings, but we could tell it was receiving power and ready to go. During our examination, we removed this strip from its slot, and the whole machine shut down. We had ourselves a key at least, and if they viewed commerce in a fashion similar to ours, probably a credit card to boot. It didn't occur to me until this afternoon that there was a similar slot on the sailboat hulls. Let's see what happens."

Grant reached over and slid the metal "key" into the slot on the hull. Nothing happened to the hull, but Clive slumped visibly.

"Don't be discouraged. The carts don't run either just by sticking the key in. One of these finger sized depressions is probably a touch sensitive switch."

As he talked, Grant put his index finger in the first of the six small depressions next to the slot. The hull moved when Grant's finger went into the third depression. It rose straight up off the cradle about twenty centimeters and stopped. It didn't buzz, it didn't hum, it didn't do anything but hover there.

"Jesus!" Clive couldn't think of anything else to say. He dropped to both knees and looked at the underside of the hull. It was as smooth as ever. There was nothing connecting it to its cradle.

Clive leaned over on his left knee and reached out for one of the myriad rigging tubes lying on the floor beside the cradle. "Stand back. I'm going to pass this tube under the hull."

There was no shock, vibration, or resistance as Clive passed the tube between the hull and the cradle. "I don't feel a thing. See if you can push the hull away from the cradle."

Grant stepped closer and put both hands on the side of the hull. He started gently and built up to pushing so hard that his feet started slipping. As he was about to give up, he thought he could see that the hull had moved a little—not sideways but along its longitudinal axis. Grant shifted his feet as he was straightening up and pushed more toward the bow. The bow moved forward but still without lateral movement.

"Well, you moved it a little." Clive scuttled around to the stern of the hull and sighted along its bottom. "But only forward, not a millimeter sideways for all the effort." Clive reached up with his right hand to pull himself erect and almost went sprawling as the hull moved effortlessly away from him in line with its long axis. As he shuffled his feet to keep from falling, Clive gave the hull even more of a shove, and it shot over the hull in front of it. While both Grant and Clive watched, too amazed to react, it zipped over the other three hulls in racks in front of it with an undulating movement and stopped with a reverberating clunk as it hit metal doors at the far side of the room. The hull slowly settled to within the same twenty centimeters off the floor.

"Jesus!" Clive still couldn't think of anything to say.

Grant stood there with a curious expression for a while and then walked to the hull and removed its key. The hull dropped sharply to the floor. "Let's get some coffee and a bite while we think about this." Clive was still stunned and followed blindly while Grant led him to the cafeteria.

As they walked into the room, Clive's consciousness returned with the prod of seeing Janet sitting alone at a table in the corner, a cup of coffee in front of her. He grabbed Grant's elbow and steered him in her direction. "Janet, this is Grant Zimmer. The Grant Zimmer. Grant, Janet Fionelli, also fresh this morning."

Janet smiled a hello and Grant had on his genuinely-glad-to-meet-you smile again. Clive immediately launched into a narrative of his and Grant's latest discovery on the sailboats. "And now we're trying to figure out just what the Hell the significance of this is."

Janet looked perplexed, first at Clive, then at Grant. "Grant, have you seen the latest reports from Biology?"

Grant smiled sheepishly. "Well, to be honest, I don't follow a lot of the regular reports coming out of the excavation because I don't understand the technical jargon most of them are buried in. I gave up right after I got here."

"I was getting the standard computer review of past biological findings at the site and a more in-depth update of all the recent findings. About a week ago, there was a report that detailed conclusive evidence that there was not a body of water here during the time of the city. In fact, there has probably never been a body of water in this area. The first thing I thought about was Clive's sailboat theory. Where does the report leave that?"

Grant looked at Clive. Clive was staring straight ahead. It had been a stunning day. It looked now like his world was about to collapse around him, but he knew he was right. What was missing?

Grant jerked upright. "I've got it! It fits. My turn, Clive. The boats sail on sand, not on water. That's why they float when they turn on. They don't need water."

Clive smiled and added his own twist. "And that's why they moved along the long axis of the hull with no apparent friction but couldn't be budged at right angles to that axis. Lateral resistance is normally a keel function on a sailboat, but in this case, you don't need a keel and you don't need any water to stick it in. You're right, Cal."

~ ~ ~

The men turned-to to see this ship
Again splayed-out in full-blown splendor

Clive heaved the tiller sharply to miss a sand hump at the top of the small dune he was cresting. As the scow veered to port, the right-side holo flicked and Clive got a glimpse of one of the same icons he had spotted on previous evasive maneuvers. This one looked like a bird, with a very long beak. They were damned strange icons for a navigation program.

Through his frosted faceplate Clive could make out a string of fuzzy figures emerging from the vehicle bay airlock of the base camp. They were forming a line along the edge of his obvious route back to the excavated doors of the boathouse.

Clive glanced up at the rigging. The telltales sewn into the mainsail hung limply as the frictionless scow was making almost wind speed. The big main stretched all the way out to starboard with the spinnaker set to port. Through his suit, Clive couldn't even feel the slight wind from astern.

He hadn't lost his touch, the racer's eye for selecting the most efficient combination of headings from the start to the finish, no matter what the direct course's relationship to wind direction. When he had rounded the last mark he was far enough away so that, even with a good lens, no one could have seen how poorly he had handled the unfamiliar rigging. With a little luck he could take her all the way in without touching the sheets again; one hand on the tiller, one hand waving to the crowd. Magnificent grand-standing for the holo cameras grinding away on top of the base camp.

~ ~ ~

Bob Prosky watched intently through his safety glasses as the last coils of aluminum spun off the lathe tool. "Done, as soon as I un-chuck it." Bob had gravitated toward a friendship with Grant early on in the excavation effort, since Grant seemed to have more imagination and drive than any other three or four people put together on Mars; except for himself, of course, because that was the way he lived and worked too. Plodding wasn't his style.

When Clive had shown up on the scene, Bob had quickly added him to his clutch of activists. There were only six or seven of them at any one time, with the rotations back to the orbiting station and to Earth, but they had all pitched in to help with some element of fitting-out the sailboat. It was amazing what assorted pieces of knowledge and skill a small group could harbor.

Both Clive and Grant took a begrudging half-step backward out of Bob's way. They waited silently as he loosened the chuck jaws and pulled out the finished masthead fitting. This fitting, like

all the others, was a combination of Clive's experience as a small boat sailor and Grant's engineering creativity.

For the last six weeks they had been designing the rigging, wheedling supplies out of Logistics, buying drinks at night for half of Maintenance Engineering, working twenty-hour days, and loving every minute of it.

Even with all the work they had put into it, they knew the rigging was at best a jerry-rig, compared to the original design. In fact, it was a pyramid of jerry-rigging: metalized polyceramic film for the sails, cut and welded with a salvaged navigation laser; the original spars with machined bearings and end fittings; and sheets, blocks, and shackles "borrowed" from the cargo bay of last week's supply shuttle.

Grant could barely restrain himself from snatching the fitting from Bob's hand and dashing out the door. But he kept the adrenaline in check, waited for the fitting to drop in his hand, mumbled a thanks, and left the shop at a conservative pace. Clive was one step behind.

Thankfully, they only had to go about fifty paces to the center of the adjacent warehouse dome. Early in their reconstruction they had seen the advantages of proximity to the maintenance shop and had moved the scow with a lift truck.

Grant walked to the top of the mast, which was lying down over the stern of the scow, and stuck the fitting into the end. "Hand me those lock pins on the bench and the stays hanging on the wall."

Clive scooped up the pins, passed them to Grant, and sorted the four stays so he could proffer the proper one as Grant attached them to the masthead fitting. "Okay, Clive, let's get her up again and see if she swivels better. You pull, I'll guide to keep her going up straight."

Clive let the forestay slide through his fingers until the terminal fitting was in his hand. He tied a bowline through the fitting on the forestay with the length of line he had running through a sheave mounted high on the curving dome wall and back through the winch on the boat, which was firmly strapped to the floor of the building so it wouldn't slide when pressure from the winch was applied. The base of the mast was butted against a strapped-on poly block, and the mast pivoted slowly into an upright position as Clive, with the winch doing all of the work, steadily pulled the mast upright. A little fishing around to seat the pin fitting, and the mast was stepped. Clive slid the forestay lock pin into place, and started tightening the turnbuckle. "Got it, Grant. See how she swivels."

Grant stretched over to the mast with both hands and swiveled it back and forth. "That's got it. If you're sure those bay doors are tall enough, we'll just leave her stepped and roll her out on a lift truck. She flies today."

~ ~ ~

It was the winches that had been the only serious problem they had in refitting the scow. Winches are complicated pieces of machinery and it would be impossible to make them in the maintenance shop, even with the design being sent up from earth, but with a twenty-meter mast, there was no other way of handling the halyards and sheets. At least, human arms and hands couldn't do it.

The solution had been both simple and inexplicable. Simple, because the solution was accidental and as complicated as "place the red peg in the red hole." Inexplicable, because no one could explain how or why it worked. Clive had no trouble visualizing the numerous holes as attachment points for the many fittings that dot the hull of any sailboat – presumably, even a sand scow. And Grant had had little trouble designing a spring loaded spread pin that would lock the assorted fittings firmly in place.

But some of the holes were different. Even though they were about the same size, they started curving just through the skin of the scow, turned 180 degrees, and came back through the skin about ten centimeters away. Grant discovered the curved holes when his screwdriver jammed as he was checking the hole depths, and he replaced the screwdriver with the end of a piece of the braided polyceramic lying nearby. He kept stuffing it in the hole and wasn't really surprised when it

came out the adjacent hole. He grabbed the line with hands on either side of the holes and pulled it back and forth a few times. A tie-off fitting was about all he could think to use it for.

Later, when he and Clive were getting ready to run a few power-on tests of the steering system, he had noticed the line running across the floor still sticking through the looping hole in the boat. He and Clive had the same idea at the same time, but Clive had the aft end and Grant had the forward end.

Each pulled about the same time and the line yanked Grant's arm with a jerk and slid through his grip.

Grant fell against the side of the boat and looked at Clive wondering why he pulled a dumb trick like that. Clive had dropped the line when he saw what happened to Grant and was looking at his hand when Grant again grabbed the line and yanked it through.

"Hold on, Grant. Give me that line back."

Grant, still a bit peeved, reached down for the line and gave it back to Clive. Clive threaded it back through the holes and again gave Grant the forward end. Grant took the line, wrapped it twice around his hand, and braced his feet against the hull. If Clive wanted to play games, it wouldn't be so easy when he was ready.

Clive, looking like he was making no effort at all, pulled the line through the looped hole while a sweat broke out on Grant's forehead as he strained against the moving line. As his wrapped hand was almost at the holes, Clive let the line slide through his open hand and Grant flopped back to his previous position, sitting on the floor. Before Grant could say anything, Clive took the line between thumb and forefinger and again pulled Grant straining off the floor.

Grant sat there with a perplexed look on his face, but Clive was smiling. Clive knew what he had found and wasn't worried about the mechanics of how it worked. He had a power winch.

Clive pulled the aft line again. Even though the line was pulling across the edge of the hole and the rim of the hull, there was almost no resistance. With a hand on the line on both sides of the U-hole, Grant pulled the line back and forth. When he pulled with his left hand, the line slid out of the aft hole with the slightest of pressure. In fact, with the slightest effort of his left hand, his right hand, with the greatest of effort, couldn't resist. If his left hand backed off to about a half kilo of pressure, the right hand would begin to be able to pull the line back through the forward hole. As the left hand pressure continued to lessen, the resistance to the right hand dropped off to nothing.

It was definitely a power winch, and was only one of six onboard. The test gear they brought in indicated that the pull pressure on the forward side varied exponentially with the pull pressure on the aft side. Clive delighted in demonstrating it to all comers by lifting a thousand kilo pallet of prefabricated dome panels with a simple pulley, a twenty-five meter piece of polyceram, and a flex of his elbow.

~ ~ ~

A silver specter of the past
Ghosting by the present

While lost in the reverie of speculation on his magnificent appearance to spectators at the base camp, the scow had moved over the first of the two slow dunes between him and the camp, down into the trough between them, and up the gentle incline of the last. The red beacon light on the roof of the base camp popped-up ahead of him as the scow crested the dune.

There before him on the stretching Martian desert was the expedition base camp, dwarfed by the domed city being reclaimed from the sand. About thirty figures had strung themselves out in front of the camp, a silvery line of pressure suits and helmets pointing back to the ramp cleared from the doors of the boathouse. Clive again had that feel of racing, of closing on the finish line. He could almost hear the crowd cheering him on.

A red blinking light in the right holo display caught his eye, and flicking his eyes away from the crowd momentarily, he saw that the icon had changed again. This time it was a flashing red face,

fierce but abstractly human. He had seen it before. In fact, he suddenly knew he had seen them all before, and he couldn't believe the message his eyes were giving to his brain. He was certain he had seen them all in aerial photos of the plains of Nazca. If he was right, he'd sure knock the socks off some of the stodgy and softer sciences.

Lots of the "un-scientific" theories about the purpose of the Nazca images revolved around them being some kind of navigation symbols for spaceships, and it seems like they had been right, as far as they had gone. What they hadn't figured out was why a technology with spaceships would need visual navigation aids dug into the ground.

The images that had bewildered scientists for two hundred years were not there to guide descending spaceships. They were probably there only as copies of the icons from navigational computers. Probably from the artifacts left behind by the space-farers. Artifacts that gradually took on a religious importance to the more primitive and earth-bound culture of the Nazca plains. The icons must have been a greeting, a message, a plea for the Gods to return.

All the clues were there. They had been there for a long time: the dating of the city, the sum of deduced Martian physical characteristics, subtleties of the architecture, the pattern of luxury devices, and many more. It just hadn't focused before. It needed a lens. It was mirrored on the scene before him. Reflected to his eyes and focused, through the icon, into his brain.

No wonder so many of the city's features seemed human-like. There is, at least, a cultural link to the Martians. He wasn't sure just how or how much, but he was sure. The chances of a parallel culture, in total isolation, down to the same leisure time and spectator sport activity had to have a lot of zeros following the decimal point. Behind the glaze of his eyes, his mind grabbed speculation after speculation, spinning them around, examining them again and again from new perspectives. We could be the genetic descendents of the survivors of this city, or the result of their cultural infusion, or the product of their guided development, or an unsuccessful and abandoned experiment.

Clive chuckled to himself. What a subconscious thrust the unknown writer of that hand-lettered sign had had when he named the central open area of the dome "Machu Picchu Park." The possibilities kept stringing-out, but the link was solid, and the answer was in the city. Still to be uncovered, understood, or deciphered.

Clive didn't think it was possible for his body to put out more adrenaline after the last hour, but he could feel the surge of excitement, taking him beyond the exhilaration of his accomplishment with the scow to a keen expectation of the challenge ahead.

As Clive reefs her glory
Slips her down the gentle slope of the excavation
And berths her again in her ancient crypt.