

MERRY CHRISTMAS

Bob Rodriguez closed the squeaky door of the Observatory, and walked across the dusty parking lot towards his jeep, breathing in the smell of juniper.

The door of the jeep bore a circular emblem – *Los Altos Solar Observatory* – in red letters with a simplified picture of a telescope in the middle. But it was obscured now with the dust borne by the fall winds. In fact, the moan of the winter air over the side of the mountain was quite audible as Bob paused before turning on the ignition. There was also a cold edge to the still air in the vehicle's cab; and before long there would be a layer of frost between the greenish-gray cactus that dotted the hillside.

"Christmas is coming," muttered Rodriguez, as he waited for the old jeep's sputtering engine to warm.

He did not like Christmas: too much hoopla, too much pressure to buy things, and (after losing his wife Serena close to two years ago) too much *ache*.

But, Bob reminded himself, Christmas was a happy time for children. His eldest, Sam, was a too-wise child whose disavowal of Santa Claus put a notch in his otherwise considerable popularity at the local school. His youngest child, Serena, was named after her absent mother but luckily did not understand the details of death or skin cancer, and was only too happy to accept Santa Claus as a real being and look forward to his coming.

Introspecting, Rodriguez shifted the gears of the vehicle at the edge of the parking lot, so that it could coast down the mountain side in neutral. He had done the trip so often that he could negotiate the twists of the gravel road that led into town with only an occasional dab on the brakes. He belonged to that special cadre of people who worked at astronomical observatories, and whose location was such that they could drive home at the end of the day using no energy source but the Earth's gravity.

As the jeep gained speed, it entered the shadow cast by the telescope. This was not what most people understood by the term, but rather a metal box that slashed down the mountain side like an engineer's ruler discarded in the sand and mesquite of the desert. For it was basically just a square-sided tube, designed to catch the image of the Sun at its top and magnify it into a scientifically-dissectible object at its bottom. The offices and main parking lot of the Los Altos Solar Observatory were at the top end. This was mainly due to the geological accident of an

outcrop of hard limestone, which formed a kind of anchor, as if stopping the massive structure from sliding down the mountain. Also at the top end of the observatory was the cover, opening at sunrise and closing at sunset, directing the Sun's rays into the guts of the instrument. Along its lengthy trajectory down the hillside, the sunlight was purged of local contaminants – including those from the streetlights of Los Altos – and entered the scientific barrage of instruments at its lower end as pure star energy. There the machines got to work: dissecting, refracting and focusing; extracting every nuance of information from the rays of the local energy source which mankind condescendingly refers to by a simple three-letter name: the *Sun*.

There is a colossal amount of information in sunlight. And Bob Rodriguez briefly considered this as his silent jeep neared the lower end of the observatory on its way into Los Altos. There were of course the lines in the spectrum, which ran from the ultraviolet to the infrared, with much of it outside the range of the human eye. And then there was the polarization – the twisting of the electric and magnetic components which make up all light. And then again there were the “strange” things (as he liked to call them): the blips in the spectrum of sunlight which had no rational explanation. Rodriguez briefly recalled an off-the-cuff opinion by that doyen of theoretical astrophysics, Hoyle. Though a man of limited mathematical knowledge, Rodriguez had seen thousands of solar spectrograms in his short career, enough to tell him that there was a lot in them that was not understood. So he was sympathetic to Hoyle's guess: There was hidden information in sunlight.

Rodriguez yanked over the steering wheel, causing the old jeep to slew around a large boulder. The latter had not been there yesterday. But as winter increased its grip, the cliffs were fracturing. Cursing, the Director of the observatory made a memory to re-send his last email to N.A.S.A. *The Los Altos Solar Observatory is dependent on a 1-in-3 slope road. This requires regrading. In lieu of the decision not to surface the road (see previous memos), I wish to remind Administration that the Observatory can only continue to function if the gravel surface is kept in good condition. Otherwise, access will be impeded and good data, particularly on sunspots, will be lost.*

Angry, Rodriguez braked the jeep, and it came to a sliding halt in front of the building at the lower end of the observatory. This was a structure of corrugated iron, whose surface was dented by the side of the entrance, where a delivery truck had lost traction on the pebbly surface while delivering equipment some time before. It was only a small thing, but it caused the scowl

on the face of Rodriguez to settle even deeper. Administration in its financial shenanigans had given them an even million for a new coronoscope to make better views of the Sun, but would not part with a peso to fix the road on which the Observatory's operation depended.

Suddenly, Rodriguez realized he was being too serious, and gave a short sarcastic laugh. This was heard by a thin man bearing a backpack, who happened to be leaving the building at the end of his work shift. The figure sauntered over, to rest a tanned elbow on the edge of the jeep's open window and a sneaker-shod foot on its battered running-board. "What's the joke?"

"Nothing much, Lance" replied Rodriguez. "But there's a big rock in the road a ways up that'll have to be removed."

Lance Percival's close-cropped head swiveled slightly, his blonde eyebrows puckering as he looked up the mountain. He made no effort to shade his blue eyes, which seemed to be bleached by the Sun which he had spent most of his life studying. By comparison, Bob Rodriguez had deep brown eyes set in a sallow face which bore a slight but permanent squint, due to years spent looking not at the Sun itself but at its spectra as recorded in the gloom of the Observatory's laboratory. Both men knew the Sun, but in different ways – the practical and the theoretical. And on a personal level, the two men hardly knew each other at all. Rodriguez had only once been in the bachelor apartment which Percival rented in town. It had been a visit demanded by protocol, when Rodriguez as the newly-appointed Director had called on the more senior Percival to ask him to stay on, though without the promotion that had seemed to be a given. The one thing that registered in the memory of Rodriguez was (of all silly things) the collection of empty beer bottles which adorned the balustrade of Percival's balcony. However, those bottles were not the mementoes of some alcohol-fixated adolescent. Rather, they were in the nature of an experiment. For at this altitude, the unseen ultraviolet part of the Sun's radiation was intense. It was strong enough to change the colour of the bottles used by the local beer store. Arranged by age, the new ones were brown and shiny; while the old ones were white and criss-crossed by numerous tiny cracks, as if the glass was ready to fall into dust.

Framed in the vehicle's open window, Rodriguez noted that the skin of Percival's face was also criss-crossed by a maze of fine lines. But if this was due to the Sun's ultraviolet, the change must be only superficial. For the Director's second-in-command was enviously fit, as evidenced by the bicycle which stood against the wall of the building that housed the

coronoscope. Percival, with a nod of farewell, started to walk towards his chosen form of transport, which Rodriguez thought must be a joy to ride home but an agony to ride to work.

It was apparently taken for granted that the boulder in the middle of the road would be taken care of, because Percival's parting comment was about a different matter. "Bob, you should take a look sometime at the last batch of sunspot data." The saddle of the man's bicycle had been drained of colour by the high-altitude sunlight, and now matched the khaki of its owner's shorts. "They don't look completely random to me."

Rodriguez grunted an acknowledgement, and waited while Percival accelerated down the steep road, disappearing round one of its numerous switchbacks in a cloud of dust. The Director gave his vehicle a short burst of power, before slipping it into neutral and coasting downhill, his mind musing on randomness and information.

The town was noisy, with end-of-day shoppers taking advantage of the coolness of the evening air. The Avenida was packed with both locals and tourists. The former were shopping mainly for the staples – tortillas, meat and red wine. The latter were shopping mainly for the knick-knacks for which Los Altos was famous – arrow heads from bygone civilizations, and artifacts made by the modern indigenous population. Particularly popular were the constructions of rawhide and feathers known as dream-catchers, which cost almost nothing to create but sold at a premium to superstitious city-dwellers, who believed that when suspended over their harassed owners they would protect from the nightmares of a materialistic world. Most of the tourist stores also displayed over-stuffed Santa-Claus dolls made from some artificial material of a shocking red colour. Rodriguez did not care either for the dream-catchers or the Santa-Claus dolls. This even though he was $\frac{1}{4}$ Indian by descent and had been brought up in a traditional family where Christmas was the major event in the calendar. His mother had once chided him when as a nine-year old, he had ignored the Christmas presents from his immediate family in preference to one from a seldom-seen uncle: an astrolabe. It was a mystery where that iconoclastic relative had obtained this antique instrument, which has been used in bygone times to determine altitude from the objects in the heavens. But to the young Rodriguez it had been a marvel, and in middle age it was still his most valued possession, after his children.

The dusty jeep negotiated its way down the Avenida, slowly displacing the season-frenzied shoppers for whom the connection between Christmas and the Sun's place in the sky was merely an abstraction. Los Altos, as its name implied, was located high up in the mountains.

It was situated on a small plateau, which must have been a godsend to its founders, who inhabited a hostile terrain of spiky Sun-blasted peaks and deep, gloom-filled canyons. Even today, it was a difficult place to access. The plateau was too small to provide an airstrip, and the helicopter pad was only for use by the medical services or the local self-important politicians. A long, sinuous, steep-sided road notorious for accidents connected the town to the nearest city; but that represented the best part of a day's travel. Nevertheless, Los Altos flourished. Its spectacular and remote location made it a prime tourist goal; and its altitude and clear, thin air made it an exceptional place for an astronomical observatory. Sometimes, Rodriguez wished that it were possible to dispense with the first part of this deal and retain only the second.

"But you can't have everything," he sighed, as he turned from the Avenida into a narrow lane known as the Embarcadero. Why it was called this, he had no idea, since no traffic of any significance had left or come in his memory. Indeed, there were only four houses on the street. It dead-ended with a low wall, beyond which was a dizzying drop into a ravine whose sides were populated by a handful of tenacious bushes, between which skittered a variety of large-footed lizards apparently immune to vertigo.

Rodriguez eased the jeep into the narrow garage, its close walls shutting out the soaring scenery and providing a homely sense of security. Before the noise of its motor had died, the confined space was filled by another, more-welcome sound: the high-pitched cries of children over the staccato sounds of their footfalls. The side door burst open, restrained by an old lady who watched indulgently as Sam and Serena clambered into the jeep to greet their father with overlapping enthusiasm.

Sam started flipping the switches on the vehicle's control panel. Water squirted onto the windshield, turning its patina of dust into sludge that was whisked away by the wipers. The headlights went on and off, on and off; until the boy found the audio control, and the garage reverberated to the sounds of *The Who* singing at excruciating volume "*I can see for miles and miles and miles and...*"

Serena ferreted about in the jeep's interior, quietly searching its hidden recesses for the piece of candy which somehow and miraculously always appeared, day after day...

This was the start of the evening routine which usually occupied the Rodriguez family. While not rigid, it was a convenient sequence of events which maximized the time that the father and the children had to interact with each other. Marianne, the old Indian lady who had largely

taken the place of the dead mother, had made the dinner which awaited the father and kids. She was already pulling over her simple homespun dress the incongruously thick space-age anorak which protected against the cold of winter in the mountains. With a smile to Bob, she disappeared into the grey of dusk, which at this altitude rapidly became the black of night.

Dinner was taken on the low table in front of the fireplace, where mesquite branches popped and sang, encouraging conversation.

“Daddy,” said Serena as she rotated a piece of cheese between her teeth, taking an occasional bite, “are we a *boring* family?”

Rodriguez continued to chew on his mouthful of chili, refusing to fall into the cliché of the father surprised by his child’s question. Finally, he responded carefully “What do you mean?”

“Well.” Serena waited to swallow her piece of cheese, respecting the table manners she had been taught, before answering. “*Some* people say we’re something out of a book. Like, you have two kids – a girl and a boy – and that you don’t want to have any more and marry anybody else because Mommy was too good. And that she died of the cancer thing that’s from the Sun, but you look at it all day and are friends with it. And that Marianne isn’t really our grandmother. *And* you’re clever, but like most Dads you don’t believe in Santa Claus.”

Rodriguez stopped chewing, unable to act nonchalant in the face of this babbling barrage. His dark eyes became even more shadowed at the implications of his daughter’s comments. However, she did not notice.

“*And*,” she finished triumphantly, “we live in a tourist trap!”

Rodriguez put down his fork with a clatter. Outwardly he looked calm, but inwardly he was dismayed. What the *hell* was all this about? He was marshalling his thoughts for a reply, when he was cut off.

“*Stupid!*” Sam yelled at his sister. The son had noticed his father’s look of concern, and while usually quiet, now burst out with an emotional defence. “Dad’s all right. Maybe he doesn’t *like* other ladies! That cancer thing wasn’t *his* fault. And only a dumb little girl would believe in Santa Claus!”

Abruptly the boy stood up, tears pouring down his face. He bolted for his room...

Rodriguez was appalled. What was going on? What had he missed? But he did not get the opportunity to consider the matter, because his daughter was also in distress. Her lower lip

started to quiver; and her face – which so reminded of her mother – crinkled with pain. She sobbed “Sorry,” and also ran from the room.

It was some time before Rodriguez threw off his shock and stood up. Then, he began methodically to collect the dirty dinner plates. As he washed them, it occurred to him that: Yes, he was a pretty boring person...

But: he still did not believe in Santa Claus.

Next morning, the familial storm seemed less doomful. Rodriguez got up at dawn, and over a large cup of strong coffee had a long talk with Marianne while the children still slept. The old lady’s opinion was both simple and confusing: “You will find love again one day, Bob. It will hit you like a bullet, and then you will know it was meant. In the meantime, why not Santa Claus?”

Sorting through these sentences, Rodriguez directed the jeep along the deserted Avenida. He passed three hotels, behind whose shuttered windows slept the visitors who kept this “tourist trap” alive. The ancient inns sported balconies constructed from gnarled pieces of oak, whose like was no longer to be found among the denuded hills which surrounded modern Los Altos. In between the vertical members of these old balconies were stuffed, at random intervals, figures which displayed red costumes and white beards.

“Oh well,” muttered Rodriguez, smiling slightly and thinking that he could afford to lighten up a bit. After all, Christmas was imminent. On the other hand, there was work to be done; and his mind slipped into technicalities as the jeep slipped into first gear and began the long climb to the Observatory.

He parked the vehicle outside the lower of the Observatory’s two buildings. As the dust settled, he searched the passenger-side glove compartment for his sunglasses. These were not ordinary spectacles, but made of two very thick pieces of welder’s glass, so black as to be almost opaque. Carrying this instrument, he walked to the edge of the road and looked back down the mountain. The view was long and terrific: the road winding downwards into a maze of canyons which marched away into a distant jumble of sharp peaks. For a moment, the man swayed, the vista trying to suck him off the road and into the clear morning air, to join the condors which floated effortlessly in the warming atmosphere. Far, far away there was a glowing white gem wedged between two mountains: the rising Sun.

Wincing, Rodriguez donned the special sunglasses. His pinpoint pupils dilated, and he saw that the Sun was about a quarter way up – a segment of white circle, filling the vee-shape between grey hillsides. It grew in size slowly, like a blob of luminous toothpaste being extruded from some cosmic tube. When it had grown to about half, he saw that the disk was splotted with several dark areas that resembled ink blots. Percival was right: there was an unusual display of sunspots.

Rodriguez stowed the spectacles in the breast pocket of his thick shirt and walked purposefully towards the building which housed the coronoscope. The air was chilly, but he was thinking about heat.

Most of the visitors to the Observatory were not aware of it, but the Sun was really a small core of incredibly hot fusing plasma, surrounded by a large atmosphere of cooler material whose surface was at a temperature about equal to that of an industrial iron furnace. Sure the surface was hot by conventional standards, but not that high by astronomical standards. The top layer of the Sun – which the tourists saw – was underlain by a wound-up series of magnetic lines of force, something like a clock spring. At certain places, the magnetic lines poked through the surface, allowing plasma to spew out into space. The places where this happened were cooler than their surroundings and appeared dark by comparison: sunspots. Overall, however, the density of the Sun was slightly greater than that of water. Basically, it was a huge fluid blob, quivering under the strains of its own energy.

In the time it took for Rodriguez to walk from the road's edge to the laboratory's door, the Sun lost about ten times the mass of his jeep, in the form of light.

Stepping into the dark interior of the laboratory, Rodriguez reminded himself that his job was pretty unique. It consisted, basically, in monitoring an energy monster.

It was as if an ant had been appointed zoo-keeper to an elephant.

The Observatory of which he was Director was one of the best – and arguably *the* best – of the handful of such institutions on the planet. Its status was due largely to the largesse of N.A.S.A. and the new coronoscope. This hung above him in the rafters of the building, and as he turned on its controls, Rodriguez reminded himself to be careful. A mistake, and a million in money would be down the drain, as well as many years' worth of future science.

The fact that the coronoscope was so valuable often puzzled the visitors to the Observatory, which was open to the public on weekends but was only enjoyed by those with

lungs able to function in the thin mountain air. It was, to casual inspection, only a disk of metal. But its size and edges were machined to fantastic accuracy. When placed in the way of the light from the Sun, it blocked out the star's disk exactly, allowing the study of the corona, the physics-rich layer above its bright surface. Lots of things happened in the corona, but they could not be seen in the blinding light from the Sun's surface. When the Sun's disk was blotted out, there was revealed a boiling region of plasma whose study had occupied Rodriguez most of his life. It was in the corona, for example, that the solar wind was born. This stream of particles from the Sun eventually intercepted the Earth, affecting activities on it daily, in a manner of which the average person was sublimely unaware. Via the solar wind, the corona was ultimately responsible for the Northern and Southern lights, drop-outs in radio communication, and flashes in the sight of astronauts when strange bits of the Sun penetrated their eyeballs. And to study these and other phenomena, Rodriguez and his team needed the coronoscope.

It was with a certain tension, therefore, that the Director jockeyed the massive metallic disk into place. The whirr of electric motors, mounted on girders under the ceiling, echoed from the corrugated-iron walls of the laboratory. Finally satisfied, he locked the coronoscope's controls and shifted his attention to a different part of the instrument panel. After releasing the safety switches, he pressed a button and another, higher sound filled the room: that of the shutter moving aside. Suddenly, a bar of intense white light appeared on the concrete floor. The energy of the Sun was pouring down the metal conduit constructed along the side of the mountain. Light flowed into the gloomy laboratory, filling it with liquid silver. Rodriguez raised an arm to shield his eyes from the glare, but the heat pounded into the skin of his cheeks. Sweat began trickling from his armpits, but the soaring temperature was brought under control by a bank of massive fans whose artificial breeze ruffled his hair. After checking the coronoscope controls one more time, Rodriguez cut in the spectrogram, which would dissect the light of the Sun into its components and tell what was happening at the centre of the solar system.

He muttered "Okay" to himself, satisfied that the new day's observations were under way, and headed for the door.

It was already noticeably warmer outside than it had been at dawn. Rodriguez, who never used an alarm clock, noted from the position of the Sun in the sky that he was earlier at work today than usual. In confirmation of this, a man on a bicycle appeared, slogging slowly but certainly up the hill.

Lance Percival hopped lithely from his machine, leaned it against the wall of the laboratory, and lounged over. “Morning, Bob.” The fit second-in-command of the Observatory was not sweating, something which caused Rodriguez to feel slightly envious. “You’re up early.”

“Yes,” replied Rodriguez. “I wanted to get more data on the iron lines in the corona, before Christmas.”

Percival looked at Rodriguez with the bleached blue eyes which always seemed to indicate casual assurance. “More iron outside matches the increase in sunspots on the surface.” There was a pause, while both men digested this. “Did you look at the spots?”

“Yes, I did,” confirmed Rodriguez. “Though only by eye.”

It was a curious fact, that throughout the long history of astronomy, there were very few reports of naked-eye observations of sunspots. The renowned Hoyle – whose textbooks occupied a good section of the bookcase in the Rodriguez house – had commented on this, and had himself only seen one sunspot with his own eye during a long and observant life. For this paucity, Hoyle had advanced two possible explanations. One, that seeing a sunspot with the unassisted human eye required an unlikely combination of natural factors, including very large disturbances on the Sun and a thick atmosphere on the Earth – which looked through near sunrise or sunset would diminish the otherwise blinding light from the Sun’s disk and make the spots visible. Second as a possible explanation was the simpler but enigmatic one, that sunspots were only visible to the naked eye when somebody or something wished to send a message between the Sun and the Earth. This second hypothesis had never been taken seriously by astrophysicists; but then, neither had they been able to prove the first...

Rodriguez refocused his attention on Percival, realizing that he had missed a part of the other man’s conversation.

“... So, I thought it might be a good public-relations thing to have the kids from the local school up here on Christmas eve, so they can see the Sun.”

Rodriguez was slightly resentful that this idea had not been voiced earlier, but had to admit that it was a good one. After a brief hesitation, he said “All right, Lance.” Then thinking that the suggestion needed more support, added “I’ll bring *my* kids. It’s ages since Sam and Serena really saw the Sun.”

At that moment, a truck came into view around the lower bend in the road. It was packed with labourers wielding crowbars and shovels. Presumably, this was the (over-large) contingent whose job was to remove the boulder which blocked the upper part of the Observatory's road. As the truck's wheezing engine slowed, Percival walked over to negotiate the task, while Rodriguez headed back to the laboratory.

It occurred to Rodriguez – not for the first time – that it was a good circumstance that he and Percival had different scientific interests, he in spectral lines and the other in sunspots. That not only covered both sides of the Observatory's function, but also prevented the two men from stepping on each other's academic toes. The dozen or so technicians who made up the complement of the institute's staff also divided roughly into two groups, those who split the light of the Sun into its microscopic parts and those who measured the gross features of the surface. Over the years, it had evolved that on each clear day Rodriguez would use the scope for his spectra in the mornings, while Percival would use it for his spots in the afternoon. It seldom happened at this high site that the weather was cloudy or that the wind was so strong that it shook the scope and made the "seeing" bad. Hence there was an abundance of data; and shortly the rest of the staff would arrive, to carry out the routine analysis which lay behind the Observatory's monthly reports. Occasionally something special happened – like the recent transit of Mercury, when the solar system's innermost planet had passed across the Sun's disk. At such times there was frenzied activity, in which all of the staff participated and which resulted in a special publication. Writing these latter was a chore which, as Director, usually fell to Rodriguez. The result was that most of the Observatory's academic papers were authored by Rodriguez, Percival *et al.*, an order which went against the alphabetical one but which appeared to be acceptable to the laid-back observer of sunspots. To the other astronomers around the globe who read these papers, it must appear that the two main authors were bosom research buddies. In truth, not only did the two men not know each other on a personal basis, they also had little idea from day to day about each other's scientific work.

As he re-entered the laboratory the thought struck Rodriguez that being a professional astronomer was probably the most lonely of professions. He often spent the whole morning in seclusion, his only companion the massive telescope that hung over his head like some metallic god that demanded his attention to the exclusion of all else. Maybe it was the long periods of

seclusion which cause most astronomers to develop an almost anthropomorphic attachment to their telescope – like when bereaved people became obsessed by their dogs.

Rodriguez gave one of his short, sarcastic laughs. After the slow, agonizing death of his wife from the skin cancer which had burrowed ever deeper into her body, there was nothing he did not know about bereavement. With an unexpectedly vicious movement, he shifted the lever which controlled the position of the coronoscope. There was a squeal of gears set into too-sudden motion, and the massive disk of metal began to move. Ponderously, it shifted out of the beam of sunlight which had made its way down the evacuated tube that stretched along the mountainside. The pure light of the Sun – unaffected by air or dust – formed a growing yellow pool on the concrete floor. It grew in size steadily, overlapping the corner of the laboratory and climbing up the wall. The image, because of the optics involved, was larger than a man. The blob shivered spasmodically, driven by its own energy, like something from a horror movie.

But Rodriguez was not scared of the glowing blob. He fished his special black spectacles out of his pocket, and donning them, turned himself into a caricature of the mad scientist.

The sunspots Percival had mentioned were plain to see: a straggly series of blobs trailing across half of the Sun's disk in a pattern which suggested impending order. As he watched, another spot drifted into view while the Sun rotated slowly on its axis. But like an archaeologist with only a fraction of the hieroglyphs, he could not make sense of the symbols.

The circular edge of the Sun was trembling, where massive explosions were throwing matter out into space. What they contained in the way of possible information was already recorded by the coronoscope's computers. He watched through his bulbous fly-like spectacles as a burst of energy bigger than the Earth erupted from the Sun's surface. It stretched into a taut bow of plasma, and then broke – sending a flood of particles into the solar system, some destined to reach his own small planet.

Rodriguez was standing, a black stick-man in the middle of the Sun's white-hot circle, when the door of the laboratory opened.

“What the hell are you doing, Bob?”

Percival's voice was calm, but concern for the other man's health made his arm strong as he pulled Rodriguez out of the pool of radiation.

This incident, which Rodriguez admitted was out-of-character but which he regarded as unimportant, could have passed away; had it not been that it had been witnessed by one of the

rock-removal crew. That individual, despite the fact that his view over Percival's shoulder must have been minimal, apparently blew the matter out of proportion to his mates. Hence the story that the "gringo" boss had been "dancing on the Sun." Percival himself regarded the incident as a kind of bad joke – observers did not normally wade into a magnified image of the Sun, even wearing eye protection. The assistant Director suggested that Rodriguez might wish to get tested for radiation damage to his face; and expressed concern about stress, given that it was coming up to the anniversary of the death of Rodriguez's wife from skin cancer.

Rodriguez, however, was unmoved by the reaction to his experiment. It was, after all, *his* laboratory; and if he wished to try to reconnect in a primal way with the object of his lifelong interest, then that was *his* prerogative.

The only thing he noted in his own emotional state was a steady rise in his dislike of the numerous images of Santa Claus. These proliferated along the Avenida as Christmas approached, causing him to look grimmer and grimmer on his daily commute. He was, in fact, on the verge of detesting Santa Claus.

At breakfast on Christmas eve, though, things were happy at the Rodriguez home. Serena chomped dutifully through her cereal, and smiled at her father when he entered the kitchen. Sam, who was not interested in his second sausage, said self-importantly "Good morning, Dad." Marianne, their old guardian, nodded a greeting from the corner of the room, and poured Rodriguez a large cup of coffee.

It was Saturday. In the old language, it was Saturn's day, which was slightly paradoxical, because while most modern people saw it as a day for young and lively activity, in olden times it had been identified with the god of old age. Tomorrow was Christmas day or Sunday, which meant exactly what it said: the Sun's day. This would be followed by Monday, the Moon's day. And so on. Rodriguez, sipping his strong coffee, wondered why people were so ignorant of their calendar, and what it meant.

However, the feeling in the room was not academic, but distinctively festive. It was not only Christmas – it was also the day of the Open House at the Observatory. Rodriguez, though the Director, had not spent any appreciable time organizing the open day, leaving that to others. Indeed, he had spent the previous days in the dark-room at the laboratory, scrutinizing the maze of spectral lines which the coronoscope had yielded from the last run of observations. He had spent intense periods of time on this activity; but apart from confirming the over-abundance of

iron, he had not been able to detect any message in the forest of data. It was as if something with iron in it had run across the surface of the Sun but left no other trace of its nature. Percival, the assistant Director, had by comparison been out in the town, promoting the public-relations event, while also keeping track of the sunspots. He had even gone so far as to obtain a supply of welder's glass, and had distributed two hundred of the black lenses to the children of the Los Altos school, so that they could keep track of events on the Sun. The town was in a hum. Even the mayor – a swarthy, semi-corrupt individual who resented the fact that the Observatory as a federal institution was beyond the reach of his nepotism – had gone on local radio, urging the townsfolk to attend the Open House.

It was therefore no surprise to Rodriguez to find a milling mass of humanity around the usually deserted laboratory, when they arrived around noon. Sam and Serena bounced out of the back seat of the jeep as soon as it stopped, disappearing into the crowd to find their friends. Rodriguez helped Marianne out of the passenger's seat, before getting back in to find a more convenient place to park the vehicle.

The normally empty road was dense with cars, some of whose wheels were on the edge of the deep drop to the canyon. Slightly irritated by this congestion, the Director elected to drive to the end of the road, where he parked the jeep by the side of the top building. As he left on the downward walk, he noted that the cover at the Observatory's upper end was wide open. The Sun's energy was pouring into the tube which slashed down the side of the mountain, where after purification it would provide an impressive image at the lower site.

Slightly wearied by the knee-jolting walk down the hill, Rodriguez pushed his way through the chattering crowd, looking for Percival. That person had sensibly opened the other side of the laboratory door, something they only did when large equipment was being moved in or out by truck. This meant that about two thirds of the crowd was now inside the building, leaving the other third to crane their necks from the periphery.

What did these people expect to see anyway? Rodriguez was not sure, but hoped they would not be disappointed. The image of the Sun – with a size bigger than a man's – would be projected onto the wall of the laboratory. It was a crude set-up, but the best that was achievable for such an affair. At least, thought Rodriguez, those attending would get a taste of real science at the solstice – in contrast to the superficial flummery of a commercial Christmas.

The crowd went quiet as the motors in the laboratory's ceiling cut in, removing the coronoscope's disk to let the Sun's light shine into the building. There was a prolonged "Oh...!" as the upper part of the white disk was revealed. Then a muttering, as the middle section came into view. This was crossed by a straggly set of dark splotches – the sunspots – which stretched from edge to edge. Rodriguez found himself mouthing letters with the members of the throng, as everybody tried to find sense in the ill-formed symbols. There was a feeling in the crowd of puzzlement and awe – almost as if a miracle was taking place.

Suddenly, there was a pulling on his pants, and Rodriguez looked down to find his children. Serena was beaming with joy, while Sam had a small, resigned smile. He did not know where they had been, but it looked as if they had already made some inference which his adult brain had yet to comprehend. He hoisted them on each an arm, and together they watched as the last part of the image revealed itself.

The Sun was a perfect yellow circle, across whose centre there was scrawled with imperfect script a short message.

As the meaning of this seeped into the minds of the assembled people, a few cheers went up. Then some began to clap. In a short time, the crowd was in full applause.

Rodriguez, baffled, squinted and brought the rough-hewn sentence into better focus. The message, written in sunspots, was simple:

MERRY CHRISTMAS

SANTA

After a while Rodriguez turned away from the message, strongly puzzled but strangely happy. Percival passed by, trying to shoo the crowd away. He sent a wink, and called "Merry Christmas, Bob. *And*, a Happy New Year."

Rodriguez, with a smiling child on each arm, replied "Yes." And that was enough.