

Gregory Benford - The Fire This Time

SCIENCE was invented once, and only once.

This is a singularly striking fact of human history. There were many opportunities for science to emerge, in the sense that we know it -- the reasonably dispassionate search for objective, checkable truths about the physical world. The Egyptians and Babylonians had lots of rule-of-thumb engineering and geometry. The Romans could build magnificently. The Chinese invented paper, gunpowder, rockets, the great sailing vessels of the Ming era.

Yet none devised the rather abstract rules which govern scientific discourse. No rival to Euclid's Elements. No deductive mathematics. No Chinese or Indian or African theorems or proofs before they learned from Euclid.

Indeed, truly modern science emerged only half a millennium ago. The term "science," from the Latin, "to know," is less than two centuries old. Before that science existed but was called "natural philosophy." Science as we know it came at the hands of William of Ockham, Francis Bacon, and then the great experimenters, Galileo and his contemporaries. The crowning jewel was the systematic, mathematical description of the most classically serene part of the world, celestial dynamics, by Newton.

They all built on the Greeks, who invented the basic idea of the method. Along the shore of that rough peninsula, over two thousand years ago, the methods of careful reasoning, always braced by consultation with the facts of the matter, evolved and won through.

Not that all Greeks held to it, of course. Aristotle lusted after the great intellectual leaps. He was impatient with facts and seldom checked his many assertions. Simple enough, one would think, to see if a heavy ball of the same size as a light one fell to earth at a different rate. But it was nearly two thousand years before Galileo looked to see, and found the truth.

I loved Greece and was immediately drawn to it. My first visit there led to an entire novel about Mycenaean archeology, *Artifact*. I grew up on a warm sea's edge, and live in Laguna Beach, California now because I simply love the rub and scent of the sea. More, I admire the cutting clarity of the air--sharper than the Gulf coast where I grew up, but sharing a smell of brine and eternal organic consequence.

I sometimes think that the Greeks developed their Euclidean certainties, their sharp visions of cause and circumscribed effect, because they lived in an air of razor clarity. The dry, lucid accuracies of Athenian air may have kindled in the ancient mind some vision of a realm beyond the raw rub of the day, a province of the eternal which obeyed finer laws, more graceful dynamics.

I thought this particularly because I was preparing, in late October of 1993, the notes for a course in ethics which I would soon teach in the honors humanities program at the University of California, Irvine. (Usually ethics is strictly a matter for the humanists, but for the past five years I have served as the token scientist in the honors courses.) It struck me how strongly Plato believed in smooth certainties lying behind our rude world, the famous shadows on the cave wall analogy. Socrates believed in higher ethical laws, too, which men could but crudely glimpse and try to copy. Idealism emerged in the sharp air of civilization's morning.

Somehow that city-state of a quarter million population produced an immense flowering in art, literature, philosophy- and science. Many cultures yield up art, music, and higher thought generally. But only the Greeks put together science. I wondered why.

I saw the smoke as I went to my one PM lecture on a blustery Wednesday, October 27. The spire of oily black smoke was about seven miles inland, I judged, near the freeway, far from my home in Laguna Beach. Dry winds off the desert called the Santa Anas brought an eerie, skin-prick-ling apprehension to the sharp air.

By the time I had held forth on turbulence theory for an hour and a half, a dark cloud loomed across all the southern horizon. The brush fire had swept to the sea. On the telephone my wife Joan said the smell was already heavy and asked me to come home.

I tried to reach Laguna Beach by the Pacific Coast Highway, only to be turned back by a policeman at the campus edge. So I went south, looping the long way around, leaving the freeway and threading through surface streets. When I had bought my Mercedes 560 SL my son had deplored its excess power, quite ecologically unsound, and I had replied lightly that I wanted to "seize opportunities." Here was the chance: I cut through traffic, hoping to get ahead of the predictable wedge wanting the only access to town.

I failed, of course. Traffic was chaotic. I took two hours to reach Monarch Bay, the community immediately south of Laguna Beach. At Monarch Bay the police stopped everyone. Smoke glowered across the entire horizon now.

I left my car at 5:30 and hiked north, striking up a conversation with a man, Dave Adams, who was walking to his nearby home. I stopped there for a drink and heard that the high school had burned. Our house sits three hundred meters above the school. On the other hand, this was media wisdom, instantly discounted. I went on, hitchhiking and walking the five miles to central Laguna by seven PM. Police were turning everyone back but the acrid flavor in the air alarmed me, and the dark clouds blowing thickly out to sea seemed to come from our hill. The police stopped me several times. I always retreated, then worked my way around to another street and went on.

I knew that Joan must have evacuated by then, but I had set out to come home and just kept at it, through the gathering pall. Maybe there was something I could do -fight the fire, water down the yard, rescue some precious memories...

On Wendt Street, near the high school, a police car came cruising down, herding the few homeowners left. I ducked behind a stone wall. "Get out of my driveway!" a man wearing a headphone radio shouted at me. He waved a pistol wildly -- a part of me noted, \$2 revolver, finger on the trigger guard, probably knows how to handle it -- and I realized he perhaps mistook me for a looter. I ran behind the police car and down a street, following the narrow windings toward our hill. Night had fallen.

I sprinted on -- excited, oblivious to choking smoke, sirens and hoarse cries. At the high school -untouched, of course -- I met fire teams and more police. Chaos. Flames leapt from our hill, a steady popping roar. Homes exploded in orange as their roofs burst open. Yellows and reds traced out the dark discords of walls collapsing, brush crackling, cinders churning up in cyclonic winds, orange motes in a fountain of air -then falling, bright tumbling fireworks. Ash swept through the streets like gray snow. Above it all a cowl of black smoke poured out to sea.

I crossed the street and climbed up onto a high ledge and still could not see far enough up Mystic Canyon to make out our house. But all around it homes burned furiously. Our street, Skyline Drive, was a flaming artery both above and below our house.

A fire warden shouted at me to get out. I hesitated, he shouted again, and I realized it was all over. At

last I gave up our house and turned away. I had been rushing forward for several hours, intent on reaching home. That was impossible. I could do nothing in this inferno. I had not gotten in anybody's way, but I hadn't done any good, either. Working my way this close to the fires was risky, if only from the smoke I inhaled. Slowly I realized that I had been running on automatic, and all this was quite foolish.

I retreated through deserted streets. I hitchhiked partway back out and a few miles south found a 7-Eleven open. An incongruous sight, bright beacon beside the exodus. I was parched, sagging. I went in and straight to the back to get a big container of cold tea.

The store owner was in a heated argument with two men who wanted to get gasoline. Police had come by and ordered the pumps closed. Excited, the owner started rattling off Korean and one of the men grabbed him by the shin collar and pulled him halfway across the counter. More shouting. The owner got free and backed away and the rest of us in the store yelled at the two men. They swore at the owner but made no more moves.

Plenty of talk then, accusations and retorts and barks of angry egos. I judged it was not going to get any worse so I left money on the counter and walked out with the tea. A block further south six motorcycle police from Newport Beach sat on their machines and watched people still leaving along the Coast Highway, their uniforms pressed and neat. They weren't interested in the 7-Eleven.

I finished the tea before I reached the Adams home. They all watched the television news and I drank some more. My thirst would not go away. I sat and listened to the announcer declare that all homes in the Mystic Hills were lost. All. Confirmation sent me into a daze.

I called friends, who reported that Joan had indeed evacuated town and come to them, and then went on to the refugee center. Dave Adams drove me to the center and I found Joan. She was in better shape mentally and physically than I. I sat on a curb and ate my first fast food burger ever, from a free canteen run by In 'n Out. It was improbably delicious.

Joan had evacuated as flames marched over the ridge line of the hill across the street, coming as fast as a person walks. She had stuffed her Volvo with financial documents, vital but small items like safety deposit keys, passports and telephone directories, plus our photo albums, the oldest of our Japanese woodblock prints, jewelry, and cherished oddments of our accumulated history.

She had been putting the pets in the car when a guy walked up and asked if she needed help loading things in the car. She suspected he was in fact interested in getting into the house, so said no thanks. He ambled away. Just as she was ready to slam the trunk closed, our postman pulled up, looking rather anxious. She took the day's mail, jumped into the car, and headed downhill. People were barreling down at high speed. The postman followed her out, stopping to deliver to homes which were soon to burn, flames approaching behind him. At the time, she said, it did not occur to her to laugh. Later, she did.

A police chaplain came by and we talked about losing the house. I couldn't seem to get my mind around the concept. We were leaving the center to go back to the friends when a neighbor called to us. He had lost his house, his classic car collection included. But he had seen our house standing at nine PM, he was pretty sure. It was hard to tell in the darkness, though, without street lights. This heartened us greatly but I had severe doubts that anything could have survived the furnace I had seen.

We reached friends, an Episcopal minister and wife, at midnight. We slept solidly until six PM. Up, talk, news on TV -- which I found oddly uninteresting, and distrusted. Breakfast out. I always eat a lot in the morning, having grown up in farm country, and this time ordered double. The restaurant seemed eerie in its calm. Pancakes and omelettes, the fire only a rank smell from distant hills.

Back to the center, where we wore away the day vainly seeking news. Nobody released any information on homes burned. News programs dwelt infuriatingly on the spectacular wasteland at the top of our hill, never letting the helicopter camera angle descend to take in lower Skyline Drive. Reports continued that everything had burned on Skyline. I was inclined to believe them, though I kept saying encouraging things to all I talked to, including our daughter Alyson, by cellular phones supplied free. I distracted myself by searching for clothes in the immense piles donated by charitable groups. I was still wearing the shorts and short-sleeved shirt I had been lecturing in, what seemed a year ago.

At four PM word came that since all fires were out we could go back into town. We left, I picked up my car, and we edged our way into Laguna. Behind me, out of my sight, Joan's Volvo overheated, stranding her for nearly two hours on Coast Highway.

Dusk fell as I reached the high school again, only to be blocked by police. Nobody allowed on the hill. Nope, not even residents. They were trying to prevent looting. Grim warnings.

I simply could not turn back. This was my neighborhood and I knew the short cuts. I slipped around the police lines, over ash-covered tennis courts, along a path and up through several burned homes, on to Skyline. Several news teams were arrayed among the ruins with portable gear, shooting interviews under their bright lights. Media okay, but homeowners keep out.

Melted cars and ashy gray debris littered Skyline. Cables down, charred palm trees. A heavy acrid stench made me cough. I walked uphill and around a curve. Amid the black ruins our house stood untouched. I approached in a daze. The battle to save it was visible only in fire hoses left in the street, boot prints in the yard and minor damage to plants.

Two doors were unlocked, one ajar. Inside, the smoky stink could not blanket my immediate reaction: home. Safe. Numbly I collected some floppy disk backups from my study. Pointless, but automatic. Our fireproof safe stood with both drawers yawning open. I took it all in but wasn't thinking much.

I departed in the gathering gloom. The street outside was covered with ash and burnt scraps. Somehow I didn't want to leave the hill, even in the gloom. I could not comprehend the enormity of others' loss, and of our luck. A German TV crew interviewed me when they found I could speak German. Crisis surrealism; a foreign tongue that recalled war zone damage.

Still dazed, I wondered where Joan was. Turned out she had been exhausted by the overheated car and traffic, and stopped at a friend's. She was quite wrung out. We finally linked up again and spent the night at a nearby friend's house. The next day, Friday, we even got into our house. About eighty percent of the neighborhood was gone, 199 homes, probably \$200 million lost. In the whole town over 350 burned, with losses around \$500 million.

The water had run out again and again through the long fight. Fire-men had been forced to abandon whole blocks to the swift flames. Around our group of a dozen homes they had drawn a perimeter and defended, using the hydrant across the street from us, which had high pressure. They worked around the houses, trampled vegetation, got the job done. The flames had come down our hill and the firefighters had stopped them at the curb across the street from our house.

Then the fire worked south, burning all the homes downhill from us, and leaped Skyline. It burned a dozen more homes below and then crawled up our canyon to within thirty meters of our house. The fire-men hit the flames with a 500 gallon-per-minute, precision high-velocity cannon. After several hours that did it. Our canyon was a black pit.

Apparently the initial small fire far inland was set by someone, the media said. I didn't care much for these larger views; my focus had narrowed to the local, intense present. Time to clean up. Our unlocked doors apparently were the firemen's work, checking for people unable to get out. Joan had left our safe closed, but not locked. A looter had come through and checked it, finding only financial papers. He took nothing. That must have been while the police cordon kept out homeowners, but not entrepreneurs ready for the quick take.

Wildlife had suffered enormously. Dead birds littered the canyon. In the hills beyond a walk through the black slopes came to a twisted wire fence. Against it was a line of white bones, the lizards and rabbits and snakes and rats and deer that had run in blind panic into it and turned to face the onrushing wall of heat.

I trapped a two-pound rat in our tool shed, and saw rats the size of cats jumping between palm trees. From our deck we watched hawks diving at mice as they scampered for shelter on the bare hillsides. We put out seed and water and birds flocked -- gnatcatchers, hummingbirds, red-tailed hawks, crows, brilliantly hued mountain bluebirds.

Two Dalmatians were found roaming, having somehow escaped their burning house. Boaters three miles offshore saw an exhausted mule deer doe swimming out to sea, away from the blighted canyons where she usually foraged. They hauled her in and brought her back for care. On the canyons, gray tree frogs turned spontaneously black, closely matching the charred ground. Somewhere in their genes lies the memory of many other fires, and a honed response to give them protection from predators, somehow triggered by the sight or smell of the flames.

All this seemed very distant, in the immense relief at being among the survivors. Our house was not particularly expensive, but what really matters, I came to feel, was how much of yourself you had put into your home. Neighbors recently moved in walked away from their ruins with apparently some aplomb. Oldtimers were more devastated.

We both slept poorly for several nights, chased by phantom flames in repeating dream dramas. Those who had lost everything were forlorn, adrift. When the Santa Ana winds picked up again, one woman who had been evacuated in the fire began automatically loading her car with cherished photographs. Some elderly couples developed the habit of taking their dearest possessions with them everywhere they went.

Counselors at the Community Clinic spoke of "post traumatic stress disorder" and of conducting "critical incident stress debriefings" but the phenomena they tried to capture with such jargon was real. I kept going over how close it had been, with the unsettled mind of one who has been shot at and barely missed.

As a scientist I habitually saw cause and effect, but the random nature of the world had asserted itself here. Much of our culture devotes itself obsessively to the comfy human world, our gossip and relationships and destinies. Now we had all been reminded that the world itself neither likes nor dislikes us; worse, in a way, it is indifferent. The fire had no point, no target in itself-- though whoever started it probably did. However much I believed as a scientist in an objective, unconcerned universe out there, which we study to understand, my emotions veered away from that.

The calamity had missed us by a hair. We had fireproofed the roof with concrete tile five years before, recoated with thick fire-resistant paint in 1992, and the morning of the fire had a garden crew clearing out the volatile underbrush. They had fled only when the flames danced above the ridgeline, just behind Joan.

We had been prepared, sure, but we were hugely lucky, too.

We had already been through the slide and burning in our little canyon in January 1993, which took out the three homes immediately below us. The immensely larger ferocity of this catastrophe was numbing. A week later, a sudden rain flooded out the five surviving homes across the street. Sandbags in our driveway deflected the ash-laden streams from us. The big storms of winter were worse.

I missed no classes and got back to research soon. But my thinking was unsettled and in reading Plato I found a curious dislocation.

An unbroken tradition stretches from Pythagoras and his theorems to Copernicus and his planetary circles. But for most of the 1300 years between them, astrology dominated civilization's attitude toward the heavens. Astrology takes a more warm, comfy view of the sky, makes it human-centered.

Greek geometry and deductive thought were unique inventions, never duplicated by other cultures. The very notion that the cosmos is ultimately open to reason comes naturally only to minds who see how general deductive reasoning is. Greek patterns of thinking barely escaped the turmoil of intervening millennia, and if lost would probably never have been reinvented.

Did Euclidean certainties come in part from an unconscious association with the clarity of air and sea and crisp, dry land? I had noted the similar feel to California and Greece, and to the Egyptian city of Alexandria, where Euclid wrote his Elements. Did they see sharp visions of cause and effect because they lived in air of razor clarity? Did it hint of a realm beyond the clutter of detail, accident, emotion? In a pristine world it is easier to imagine a province of the eternal which obeyed finer, more lofty and graceful laws.

The fire impressed me with the sheer raw power of nature. It disoriented my thinking and made difficult a return to the calculations I was doing in turbulence theory. Some part of me could not settle down to the neat, clean equations, precise markings for exact quantities; the world outside was too rife with emotion, friction, brutal forces, malicious intent. The universe seemed to be threatening, not standing at an abstract distance.

If science was such an unlikely event, one time only, perhaps we should be more mindful that its habits of mind persist in our own time. We cannot rely on clear air to insure our trust in abstract reasoning.

Further, think of the assumptions behind the Search for Extraterrestrial Intelligence. Will intelligent life develop deductive reasoning? And then build radios? If it was a singular event for us, how might the raw edge of alien environments blot out those analytical habits which have led us up from darkness? Unsettling thoughts.

There is great relief in this aftermath, of course. Still, sometimes it felt as if the world would keep trying until it got us. I suppose in a way it will.

The End

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