

The Unabomber and David Gelertner

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David Gelernter's second communication from the Unabomber killer arrived last month. Like the first, it came in the morning mail addressed to him at the Arthur K. Watson computer sciences building at Yale University. It found the 40-year-old professor of computer science at an interesting time in his career. Gelernter has been consistently, almost arrogantly, extending the breadth of his writings beyond the technical, veering toward sociology, psychology, even Biblical studies. He is bracing now for the reaction to his latest book, "1939," a study of that year's New York World's Fair, to be published next month. Gelernter thinks that event was important in part because it embodied what was then an overwhelmingly optimistic view of technology and the future. "In 1939," he writes, "technology was not remote and esoteric . . . its achievements were heroic." In contrast, Gelernter believes, it is now common to consider technology as an enemy.

The letter he received on April 24 was a grim confirmation of that observation. "Dr. Gelernter," it began, "People with advanced degrees aren't as smart as they think they are. If you'd had any brains you would have realized that there are a lot of people out there who resent bitterly the way techno-nerds like you are changing the world." It went on to blame computers for a litany of woes, including invasion of privacy, genetic engineering and "environmental degradation through excessive economic growth."

The letter scornfully mentioned Gelernter's first book, "Mirror Worlds," an optimistic view of the technological future. The developments Gelernter predicted, wrote the Unabomber, "are inevitable only because techno-nerds like you make them inevitable. If there were no computer scientists there would be no progress in computer science."

The letter was among several Unabomber mailings that week. Two letters went to prominent Massachusetts scientists, Richard J. Roberts of New England Biolabs and Phillip A. Sharp of the Massachusetts Institute of Technology, who shared the 1993 Nobel Prize in Medicine for their contributions to genetic research. Another parcel, opened by Gilbert B. Murray, a lobbyist for the California Forestry Association, was deadly. Murray was the unknown bomber's third fatality in 16 explosions, spaced over a 17-year period. Twenty-three people have been injured, some seriously.

David Gelernter is among the latter. On the morning of June 24, 1993, just having completed a vacation, he hardly noticed an unfamiliar package with a Sacramento, Calif., return address. "It was a package like millions of packages I've opened in the past," he recalls. Unlike all those other packages, however, this one contained a sophisticated explosive device, which detonated in his hands.

The blast shook the fifth floor of the Watson building, injured Gelernter severely and set his office on fire. Bleeding profusely, he dodged the flames, walked down five flights, cut through the parking lot and staggered up a small hill toward the university clinic. Once inside the clinic door, he collapsed. Doctors later told him that, had he dialed 911 and waited for help, he would not have survived.

For the next several weeks, Gelernter had several operations, first to save his life and later to attempt to reconstruct shattered body parts. His lungs and other internal

organs were damaged; his right ear required surgical repair. He lost almost all the vision in his right eye, and would eventually undergo a corneal transplant that restored partial vision. Some muscles in his right arm were lost forever. And most of his right hand was destroyed.

Sometime during these weeks, the F.B.I. informed him that he was the most recent prey of a terrorist who, since 1978, has engaged in a series of vicious mail bombings. Law-enforcement officials call him Unabomber because his earlier victims were associated with universities and airlines. In recent years he has expanded his interests to scientists, advertising executives and lobbyists. Two days before Gelernter became a victim, a geneticist at the University of California at San Francisco opened a parcel at his home and suffered similar, though less severe, injuries. On the day of Gelernter's injury, The New York Times received a letter from someone claiming to represent a group called "FC"; the letter promised both more bombs and an eventual explanation for them. The explanation finally came on April 24, when the Times received a lengthy missive from FC setting forth an anarchist agenda for "the destruction of the worldwide industrial system." (Though the letters claim to originate from a group of terrorists, officials strongly believe the bombs are the work of a loner.)

In the summer of 1993, focusing on his own survival, David Gelernter could have not have cared less about FC, or even what the mysterious initials meant. Although his body was under reconstruction, as soon as his mind cleared Gelernter wanted to get back to work. "That is David's characteristic behavior," says his editor, Susan Arellano. "Very goal-driven, very clear and direct."

"The doctor was worried that he was taking too much pain medicine," his wife, Jane Gelernter, says. "He said that if someone gets overly reliant on the medication, he might never return to work. I told him: 'You're missing the point. He's taking the pain medication so he can do his work. He simply cannot turn off his brain.'"

In the nearly two years since the bombing neither Gelernter's brain nor the body he has rehabilitated has slowed. He published one book, wrote another and reassumed his duties at Yale. He is now working on three new books. His agenda does not include looking back in anger. He never even read the Unabomber's note to him, sending it unopened to the F.B.I.

"I made a point of not reading it," he explains. "If this guy has a message for me I don't give a damn what it is." When he later heard that the day's mail had deadly consequences for yet another victim, he mourned quietly. But he refuses to dwell on the nature of the man who nearly killed him. "I don't care what his motives are," says Gelernter. "I'm not willing to describe him as insane, either, merely as evil in the unreconstructed sense."

Says David's father, Herbert Gelernter: "There aren't many people who could go through what he did and be as he is. He has always been a very optimistic person. He won't let some nameless jerk stop his career."

TODAY, THE ONLY OBVIOUS REMINDER OF THE day Gelernter "got blown up," as he puts it, is a gauze-like glove around the remains of his right hand. We are in

the living room of his house in a suburb of New Haven. There is a view of the surrounding woods. On the walls hang paintings (some done by Gelernter), posters and framed fragments of medieval manuscripts. The coffee table between two sofas is stacked with books – novels, art catalogues, histories. Two lecterns hold thick dictionaries and other reference books. There is a piano that he played almost daily before he got blown up. He still composes music, although now he notes that musical imagery has dropped from his conversations. The piano serves as an easel for the paintings he has determinedly continued to produce, using a two-fisted approach that he has developed by necessity. Side by side are two pastels. One is a depiction of Fiorello La Guardia. The other is a self-portrait – also easily identifiable (the round face, the scraggly beard, the severe wire-rims) but notable for a pensive quality not present in the physical Gelernter, who is an engaging and restless conversationalist.

In short, the contents of the room are ample evidence that Gelernter is anything but the smug "techno-nerd" imagined by his would-be destroyer. In fact, Gelernter professes ambivalence about computers, and considers himself as much a humanist as anything else. "I have a lot of respect for computer science and for computer scientists," he explains. "I'm happy in the field. But it would just be untenable to be a full-time computer scientist and not do other things. That would be an intellectual death sentence for me."

The struggle to combine computers with "other things" – the arts, the humanities, religious studies – began early for Gelernter. His father was a scientist at I.B.M. and a pioneer in the field of artificial intelligence. David himself enjoyed computers and mathematics but loved the arts as well. And following the example of his maternal grandfather, a respected rabbi, he also was drawn to Jewish scholarship.

He entered Yale in 1972, intending to concentrate almost entirely on the sciences. "I never took an English course at Yale, because I had the undergraduate chutzpah point of view that I didn't want anybody at Yale telling me how to read Wordsworth, because I could bloody well read Wordsworth better than anybody." But he became drawn to religious studies. He still took courses in the sciences, and he was particularly inspired by a computer course in his junior year. Nonetheless, in 1976, after graduating with a B.A. in religious studies, he entered Yale's doctoral program in the same department. A year later, he left Yale to study Talmud in a Manhattan yeshiva.

The pendulum soon swung back, mainly because "I was worried about how I was ever going to make a living," he admits. He entered the graduate program at the State University of New York at Stony Brook, where his father was then a professor. Gelernter's preference was to work in artificial intelligence, but pursuing this at Stony Brook would have meant having his father as an adviser. So he joined another group, which was working on a strange, though much talked-about, concept in computer science: a machine with multiple processors, all operating at the same time. The idea fascinated Gelernter.

"From the very first, parallelism seemed to me a powerful conceptual tool – it is always the way that hard problems are solved," he says. "That is, it's always the natural

human response to a difficult problem. If you want to build a house, it's better to have a whole bunch of guys working simultaneously than to have one guy working serially."

But no one had figured out how to institute parallelism effectively. One approach was to assign pieces of a task to the individual processors, as if they were farm workers getting assignments to pick certain rows of strawberries. This courted inefficiency, since some processors might complete their tasks and have nothing left to do while some were still completing the equivalent of a long strawberry row. Other solutions allowed for communication between the processors by complicated "message-passing" schemes. While this kept the processors busy, it added a layer of complexity.

Gelernter invented a new language for parallel processing, one that allowed the processors to simultaneously harvest a single area in the computer memory. You can picture this area, called the tuple-space (the term is derived from the suffix in words like quintuple, sextuple), as sort of an information commons. Individual processors cruise the space looking for tuples – data chunks in need of computation. They process the chunks and come back for more. The program stops running when all the chunks have been chosen and the calculations completed.

Collaborating with a graduate student, Nick Carriero, Gelernter got his system to work, and people were impressed. Eventually the time came to name this new computer language. The Defense Department had recently dubbed a language Ada, in honor of Ada Lovelace, the daughter of Lord Byron, who supposedly wrote programs for Charles Babbage's fabled Analytical Engine. So Gelernter, with an insouciance he now regrets, also chose a Lovelace as a namesake – Linda, the lead actress in "Deep Throat."

The extraordinary success of Linda and an offshoot, called Piranha, has helped make Gelernter a brand name in computer science, and he has capitalized on it. He and Carriero wrote a textbook on parallel programming, and Gelernter published his own book on what he considered the most significant offshoot of all that computer power – what he calls mirror worlds. He describes them as "software models of some chunk of reality, some piece of the real world going on outside your window . . . scooping up so much information that the model can mimic the reality's every move, moment by moment." He takes pains to differentiate this from virtual reality. "It's a little hard to conceive of in engineering terms, but it's supposed to mirror reality rather than being a sort of parallel reality or cyberworld as distinct from the regular world. The whole point of a mirror world is that it's wired in real time and place."

In other words, a surrogate that, when tweaked, yields consequences in the original. Just as when you stick a pin into a voodoo doll, the real-life person lets out a yelp. A relatively modest example would be a mirror world of a hospital that not only maintained the duty roster (past, present and future) but monitored the status and medical history of every patient. If someone doesn't give Mr. Johnson his medication, the mirror world will take notice and alert a human nurse. Eventually, we will see mirror worlds of entire cities, and people will be able to conduct a lot of their activities simply by interacting through the mirror world.

"Mirror Worlds" is written in a punchy urban vernacular spiked with flat proclamations. "Mirror worlds mark a new era in mankind's relationship to the man-made world," is the conclusion. "They change that relationship for good."

It is this assertion that apparently incited the Unabomber – but in conversation, Gelernter turns out to have considerable reservations about computers. Yes, he likes them and understands them, but his relationship with them is a rocky one.

"David as a general rule doesn't like computers all that much," explains Nick Carriero. "He finds them disappointing in some sense. He has a strong internal image of what they could be, what they should be, what he wants them to be. But they never seem to live up to that image."

DAVID GELERNTER'S OFFICE IN WATSON HALL, unlike his home, reflects the scientific, logical component of his nature. It is almost a hacker's lair. Nothing hangs on the walls, though a stained-glass Hebrew chai leans against the window. The furniture is institutional – a sofa, a table that does for a desk but is actually so covered with papers, manuals, magazines and books that it is more a stockpile than a work space. The overflow has wound up on the floor. Stacked almost ceiling high are towers of blue plastic milk cartons filled with files and papers, some of them severely charred by the Unabomb explosion. Strewn around the room are empty cans of Diet Sprite. Overseeing the rubble from the back of the room are the unblinking monitors of a Sun work station and a Macintosh II.

Gelernter now drives to work, a quietly triumphant result of his lengthy rehabilitation. He is emphatic that he not be seen as a victim. Only when prodded will he enumerate the extent of his injuries. The major one is the disfigurement of his right hand. "After the second major operation, an all-day thing, the surgeon was very enthusiastic," says Gelernter. "At the time, I didn't quite see what he was so excited about. I said, 'So I have a piece of hand, what the hell good is that?' Now, I more properly appreciate that – it's a lot better than having nothing."

Gelernter does say that a single silver lining has emerged from this incident: an indelible realization that anything worth doing should be done immediately. He says this epiphany gave him the courage to embark on "1939," which he took up immediately after finishing the risky and harshly criticized "The Muse in the Machine," a book he was working on before the bombing. In it he had postulated a theory of creativity based on the degree to which people focus their attention. "High focus," or direct concentration on a problem, is useful but doesn't yield innovations, Gelernter says. These come in moments of "low focus," when attention is wandering or emotions interfere with rationality. That insight, he thought, might be useful in making computers come up with original ideas: if we give them emotions and let their artificial minds ramble, they might surprise us.

With a few exceptions, the response was unenthusiastic. The psychologist Stuart Sutherland, writing in *Nature*, simply called the theory wrong. Steven Pinker, director of the Center for Cognitive Neuroscience at M.I.T., also dismissed it. "Gelernter assumes that creativity comes from this low-focus daydreaming state," he says. "It

makes a great story, but if you look at the contemporary records and autobiographies, it doesn't work that way."

Undaunted – and emboldened by his close brush with death – Gelernter is not playing it safe with another computer book. Instead, he has written a book that combines history, social commentary and even some fantasy in the form of an imaginary framing narrative that at times threatens to overwhelm the book – or turn it into fiction. "I'm comfortable calling it history," says Gelernter. "But you might call it a novel with an index." The main character is the 1939 World's Fair, which he considers the most significant exposition ever held.

Gelernter intends to deliver a moral message, too. Not many people would argue with his opening insight – that in 1939 people attending the World's Fair gobbled up the optimistic view of the future offered in Flushing Meadows, while people now, in much palmier times than in the late Depression, with World War II looming, are generally pessimistic. How did we lose the future? Gelernter's answer may raise some eyebrows. He believes that the United States realized the fair's predictions of a technological and economic utopia – and the country subsequently imploded with its own success.

"We don't have a direction anymore, because we've gotten where American society was supposed to go," he says. "We stopped driving forward because we had no place else to drive. The American dream was a good life for the middle class and the working class. You didn't have to worry about where your next meal was coming from, you didn't have to worry about starving in your old age, you could afford a car, you had such a thing as a vacation.

"When can it ever be said before that society mapped out a goal and over a period of decades actually achieved it? It's never happened on the scale that it's happened in this country, and when you look at the processes that have accompanied our reaching the goal, you are reminded again and again of the second law of thermodynamics in the sense that the entropy of American society has increased enormously, and we can't put things back together again."

THOUGH GELERNTER INSISTS THAT LIFE IN 1995 is overall far superior to life 56 years ago, his descriptions of the fair and its time are intensely nostalgic (interesting, considering that the author was not born until over a decade of dust had settled on the Trylon and Perisphere). What Gelernter seems to miss most is the well-behaved nature of the citizenry. He yearns for the days when people, for reasons of the commonweal, did what they were told. He is endlessly impressed that pictures of the fair depict almost all the males, even boys, wearing ties, and the women in dresses.

It was an "ought culture," he says, "where the idea of doing as you ought was an ever-present superego." The concept that people should simply do what they wanted to do was unheard of. There were rules for everything, from sex and divorce down to the most insignificant social gestures – rules of etiquette, complex styles of dress, elaborate protocols of service between yourself and a gas station attendant or a porter on the train. People could and did flout these rules, but there were prices to pay.

"A society with some notion of authority, where children had respect for policemen, let's say, or for a teacher, was probably not such a bad thing to have," he says. "I think we realize now that a society in which civility was valued as an attribute had some important advantages. I think it's clear that people had much higher expectations for what society would deliver to them. Certain social values that we believe are important thrived in 1939, and are on the rocks today."

Gelernter's views on the sorry disintegration of the "ought culture" place him in the unlikely company of right-wing commentators like Alan Bloom and William Bennett. (He calls himself a Roosevelt Democrat with a conservative streak – "in other words, a Republican," he says.) Yet he cannot hide the fact that he is indignant, if not outraged, about the decline of American civilization, and particularly concerned with the effect of crime. And this feeling antedated his getting blown up.

Street crime and burglaries in New Haven were a factor in his reluctant move to the suburbs. And not long ago, in support of law-enforcement authorities, Gelernter wrote an Op-Ed piece in favor of the Clinton Administration's proposed "Clipper Chip" (which would enable the Government, under certain conditions, to eavesdrop on digitally scrambled telephone conversations). It took some guts to write this, since the digital community loathes Clipper as a gross invasion of privacy.

Sure enough, Gelernter's E-mail was full of flaming rejoinders. Reading them was a sobering experience; it convinced him that even the most technologically literate people in the country are, in a profound sense, uninformed. Most of all, he bemoans, they know nothing of history. He thinks it bodes ill for the most eagerly awaited public works project in the information age.

"The information highway is going to be planned and built by obsessive software builders who are tremendously valuable in their productivity," he says. "But I'm suspicious of them as a group. Their push is to build software. I have a push to read Keats and I don't think they read Keats. I think schools today are so lousy that people can graduate from high school and graduate from college and never have heard of Keats, and I think those are the wrong individuals to build public works.

"In those messages I see assertions about McCarthy, for example, or about Nixon, or about the nature of the United States political system, that are wildly naive. These people never read 10 pages about what the McCarthy era was like! These are people who don't have any conception of the development of the American political tradition. And I think that when you do something in the public sphere, it behooves you to know something about what the public sphere is like. How did this country get this way? What was the history of the relationship between technology and the public? What's the history of political exchange? The problem is, hackers don't tend to know any of that. And that's why it worries me to have these people in charge of public policy. Not because they're bad, just because they're uneducated."

Confronting this sort of ignorance increases the urgency with which Gelernter broadcasts his message in "1939." Early in the book, he writes of a speech that would occur in the waning days of the fair's second season – Winston Churchill's rallying cry to "fight

on the beaches” to defeat the Nazi threat. Gelernter calls these the ”most memorable and defining words of the 20th century.”

It pains him that some younger people hardly know who Winston Churchill is. And he’s even more uncomfortable to find himself identified more with the technocrats than with the humanists. But that is the paradox of Gelernter: an arts-and-religion person who finds himself an avatar of the digital age, where expression resides not in poetry or metaphor but strings of ones and zeros that can be permanently wiped off the face of the earth by a single stroke of a keyboard. Digits are ephemeral but sonnets, paintings, scenes from our childhood, scents of a summer evening and the images of history lodge in the mind. Gelernter believes that computers and their mirror-world capabilities will usher in a Renaissance of the human spirit. At the same time, he sees our current society, where computers are ascendant, as lacking authority. The resulting ignorance and lack of direction could lead us to abuse our technical skills and install a digital infrastructure that oppresses rather than nourishes.

For most of us, the pessimistic vision is the more convincing one. After all, we need look no further than Gelernter’s shattered hand and snaking scars, grim evidence of the Unabomber’s mastery of technology. But David Gelernter presses towards the sunny side. Knowledge and understanding can overwhelm the dark side, he believes. And history, rather than dampen our aspirations, can inspire us to exceed our limitations. He does not have to stray far to cite an example: his own experience, on the day he got blown up.

”It seemed to me my minutes were numbered, and I needed something to help me concentrate and make it possible to get to the hospital. This building is not very far from the one across the street, but it seemed like a very long walk at the time. I was mainly thinking about Jane and my two children, but then my mind came up with something appropriate for the circumstance.

”I had been in Israel a few weeks before and driven with a colleague and her father from a rural kibbutz into Jerusalem, through a mountainous area. And my friend’s father was talking about the War of Independence. He was a person like many people I know and respect, a scholarly, thoughtful, philosophical sort of guy. I was struck that people like him had picked up rifles and fought. And so, as I was dragging myself over to the clinic, I recalled a Zionist song from that time called ’March of the Palmach,’ playing it in my head along with this image of the struggle for the hills of Jerusalem.”

It was this song that accompanied David Gelernter down five flights of steps and across the street to the clinic. And the experience obviously infused the tone of ”1939.”

Says Gelernter: ”Granted, most people will never be in a situation like that. But when you deprive people of history, you deprive them of something that has real value. It used to be regarded as obvious that you studied history to build your character. You studied the lives of famous men and thereby you learned to behave yourself.

”You became a better person. We now regard this attitude as a sort of Victorian mustiness. But I think it’s true, and have experienced it, in a literal sense. History isn’t just an intellectual pursuit. It can literally be a life-saving inspiration.”

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