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MAGAZINE DESK

The Odds of That

By Lisa Belkin (NYT) 8159 words

When the Miami Police first found Benito Que, he was slumped on a desolate side street, near the empty spot where he had habitually parked his Ford Explorer. At about the same time, Don C. Wiley mysteriously disappeared. His car, a white rented Mitsubishi Galant, was abandoned on a bridge outside of Memphis, where he had just had a jovial dinner with friends. The following week, Vladimir Pasechnik collapsed in London, apparently of a stroke.

The list would grow to nearly a dozen in the space of four nerve-jangling months. Stabbed in Leesburg, Va. Suffocated in an air-locked lab in Geelong, Australia. Found wedged under a chair, naked from the waist down, in a blood-splattered apartment in Norwich, England. Hit by a car while jogging. Killed in a private plane crash. Shot dead while a pizza delivery man served as a decoy.

What joined these men was their proximity to the world of bioterror and germ warfare. Que, the one who was car-jacked, was a researcher at the University of Miami School of Medicine. Wiley, the most famous, knew as much as anyone about how the immune system responds to attacks from viruses like Ebola. Pasechnik was Russian, and before he defected, he helped the Soviets transform cruise missiles into biological weapons. The chain of deaths -- these three men and eight others like them -- began last fall, back when emergency teams in moonsuits were scouring the Capitol, when postal workers were dying, when news agencies were on high alert and the entire nation was afraid to open its mail.

In more ordinary times, this cluster of deaths might not have been noticed, but these are not ordinary times. Neighbors report neighbors to the F.B.I.; passengers are escorted off planes because they make other passengers nervous; medical journals debate what to publish, for fear the articles will be read by evil eyes. Now we are spooked and startled by stories like these -- all these scientists dying within months of one another, at the precise moment when tiny organisms loom as a gargantuan threat. The stories of these dozen or so deaths started out as a curiosity and were transformed rumor by rumor into the specter of conspiracy as they circulated first on the Internet and then in the mainstream media. What are the odds, after all?

What are the odds, indeed?

For this is not about conspiracy but about coincidence -- unexpected connections that are both riveting and rattling. Much religious faith is based on the idea that almost nothing is coincidence; science is an exercise in eliminating the taint of coincidence; police work is often a feint and parry between those trying to prove coincidence and those trying to prove complicity. Without coincidence, there would be few movies worth watching ("Of all the gin joints in all the towns in all the world, she walks into mine"), and literary plots would come grinding to a disappointing halt. (What if Oedipus had not happened to marry his mother? If Javert had not happened to arrive in the town where Valjean was mayor?)

The true meaning of the word is "a surprising concurrence of events, perceived as meaningfully related, with no apparent causal connection." In other words, pure happenstance. Yet by merely noticing a coincidence, we elevate it to something that transcends its definition as pure chance. We are discomforted by the idea of a random universe. Like Mel Gibson's character Graham Hess in M. Night Shyamalan's new movie "Signs," we want to feel that our lives are governed by a grand plan.

The need is especially strong in an age when paranoia runs rampant. "Coincidence feels like a loss of control perhaps," says John Allen Paulos, a professor of mathematics at Temple University and the author of "Innumeracy," the improbable best seller about how Americans don't understand numbers. Finding a reason or a pattern where none actually exists "makes it less frightening," he says, because events get placed in the realm of the logical. "Believing in fate, or even conspiracy, can sometimes be more comforting than facing the fact that sometimes things just happen."

In the past year there has been plenty of conspiracy, of course, but also a lot of things have "just happened." And while our leaders are out there warning us to be vigilant, the statisticians are out there warning that patterns are not always what they seem. We need to be reminded, Paulos and others say, that most of the time patterns that seem stunning to us aren't even there. For instance, although the numbers 9/11 (9 plus 1 plus 1) equal 11, and American Airlines Flight 11 was the first to hit the twin towers, and there were 92 people on board (9 plus 2), and Sept. 11 is the 254th day of the year (2 plus 5 plus 4), and there are 11 letters each in "Afghanistan," "New York City" and "the Pentagon" (and while we're counting, in George W. Bush), and the World Trade towers themselves took the form of the number 11, this seeming numerical message is not actually a pattern that exists but merely a pattern we have found. (After all, the second flight to hit the towers was United Airlines Flight 175, and the one that hit the Pentagon was American Airlines Flight 77, and the one that crashed in a Pennsylvania field was United Flight 93, and the Pentagon is shaped, well, like a pentagon.)

The same goes for the way we think of miraculous intervention. We need to be told that those lucky last-minute stops for an Egg McMuffin at McDonald's or to pick up a watch at the repair shop or to vote in the mayoral primary -- stops that saved lives of people who would otherwise have been in the towers when the first plane hit -- certainly looked like miracles but could have been predicted by statistics. So, too, can the most breathtaking of happenings -- like the sparrow that happened to appear at one memorial service just as a teenage boy, at the lectern eulogizing his mom, said the word "mother." The tiny bird lighted on the boy's head; then he took it in his hand and set it free.

Something like that has to be more than coincidence, we protest. What are the odds? The mathematician will answer that even in the most unbelievable situations, the odds are actually very good. The law of large numbers says that with a large enough denominator -- in other words, in a big wide world -- stuff will happen, even very weird stuff. "The really unusual day would be one where nothing unusual happens," explains Persi Diaconis, a Stanford statistician who has spent his career

collecting and studying examples of coincidence. Given that there are 280 million people in the United States, he says, "280 times a day, a one-in-a-million shot is going to occur."

Throw your best story at him -- the one about running into your childhood playmate on a street corner in Azerbaijan or marrying a woman who has a birthmark shaped like a shooting star that is a perfect match for your own or dreaming that your great-aunt Lucy would break her collarbone hours before she actually does -- and he will nod politely and answer that such things happen all the time. In fact, he and his colleagues also warn me that although I pulled all examples in the prior sentence from thin air, I will probably get letters from readers saying one of those things actually happened to them.

And what of the deaths of nearly a dozen scientists? Is it really possible that they all just happened to die, most in such peculiar, jarring ways, within so short a time? "We can never say for a fact that something isn't a conspiracy," says Bradley Efron, a professor of statistics at Stanford. "We can just point out the odds that it isn't."

I first found myself wondering about coincidence last spring when I read a small news item out of the tiny Finnish town of Raahe, which is 370 miles north of Helsinki. On the morning of March 5, two elderly twin brothers were riding their bicycles, as was their habit, completing their separate errands. At 9:30, one brother was struck by a truck along coastal Highway 8 and killed instantly. About two hours later and one mile down the same highway, the other brother was struck by a second truck and killed.

"It was hard to believe this could happen just by chance," says Marko Salo, the senior constable who investigated both deaths for the Raahe Police Department. Instead, the department looked for a cause, thinking initially that the second death was really a suicide.

"Almost all Raahe thought he did it knowing that his brother was dead," Salo says of the second brother's death. "They thought he tried on purpose. That would have explained things." But the investigation showed that the older brother was off cheerfully getting his hair cut just before his own death.

The family could not immediately accept that this was random coincidence, either. "It was their destiny," offers their nephew, who spoke with me on behalf of the family. It is his opinion that his uncles shared a psychic bond throughout their lives. When one brother became ill, the other one fell ill shortly thereafter. When one reached to scratch his nose, the other would often do the same. Several years ago, one brother was hit and injured by a car (also while biking), and the other one developed pain in the same leg.

The men's sister had still another theory entirely. "She worried that it was a plot to kill both of them," the nephew says, describing his aunt's concerns that terrorists might have made their way to Raahe. "She was angry. She wanted to blame someone. So she said the chances of this happening by accident are impossible."

Not true, the statisticians say. But before we can see the likelihood for what it is, we have to eliminate the distracting details. We are far too taken, Efron says, with superfluous facts and findings that have no bearing on the statistics of coincidence. After our initial surprise, Efron says that the real yardstick for measuring probability is "How surprised should we be?" How surprising is it, to use this example, that two 70-year-old men in the same town should die within two hours of each other?

Certainly not common, but not unimaginable. But the fact that they were brothers would seem to make the odds more astronomical. This, however, is a superfluous fact. What is significant in their case is that two older men were riding bicycles along a busy highway in a snowstorm, which greatly increases the probability that they would be hit by trucks.

Statisticians like Efron emphasize that when something striking happens, it only incidentally happens to us. When the numbers are large enough, and the distracting details are removed, the chance of anything is fairly high. Imagine a meadow, he says, and then imagine placing your finger on a blade of grass. The chance of choosing exactly that blade of grass would be one in a million or even higher, but because it is a certainty that you will choose a blade of grass, the odds of one particular one being chosen are no more or less than the one to either side.

Robert J. Tibshirani, a statistician at Stanford University who proved that it was probably not coincidence that accident rates increase when people simultaneously drive and talk on a cellphone, leading some states to ban the practice, uses the example of a hand of poker. "The chance of getting a royal flush is very low," he says, "and if you were to get a royal flush, you would be surprised. But the chance of any hand in poker is low. You just don't notice when you get all the others; you notice when you get the royal flush."

When these professors talk, they do so slowly, aware that what they are saying is deeply counterintuitive. No sooner have they finished explaining that the world is huge and that any number of unlikely things are likely to happen than they shift gears and explain that the world is also quite small, which explains an entire other type of coincidence. One relatively simple example of this is "the birthday problem." There are as many as 366 days in a year (accounting for leap years), and so you would have to assemble 367 people in a room to absolutely guarantee that two of them have the same birthday. But how many people would you need in that room to guarantee a 50 percent chance of at least one birthday match?

Intuitively, you assume that the answer should be a relatively large number. And in fact, most people's first guess is 183, half of 366. But the actual answer is 23. In Paulos's book, he explains the math this way: "[T]he number of ways in which five dates can be chosen (allowing for repetitions) is $(365 \times 365 \times 365 \times 365 \times 365)$. Of all these 365^5 ways, however, only $(365 \times 364 \times 363 \times 362 \times 361)$ are such that no two of the dates are the same; any of the 365 days can be chosen first, any of the remaining 364 can be chosen second and so on. Thus, by dividing this latter product $(365 \times 364 \times 363 \times 362 \times 361)$ by 365^5, we get the probability that five persons chosen at random will have no birthday in common. Now, if we subtract this probability from 1 (or from 100 percent if we're dealing with percentages), we get the complementary probability that at least two of the five people do have a birthday in common. A similar calculation using 23 rather than 5 yields 1/2, or 50 percent, as the probability that at least 2 of 23 people will have a common birthday."

Got that?

Using similar math, you can calculate that if you want even odds of finding two people born within one day of each other, you only need 14 people, and if you are looking for birthdays a week apart, the magic number is seven. (Incidentally, if you are looking for an even chance that someone in the room will have your exact birthday, you will need 253 people.) And yet despite numbers like these, we are constantly surprised when we meet a stranger with whom we share a birth date or a hometown or a middle name. We are amazed by the overlap -- and we conveniently ignore the countless things we do not have in common.

which brings us to the death of Benito Que, who was not, despite reports to the contrary, actually a microbiologist. He was a researcher in a lab at the University of Miami Sylvester Cancer Center, where he was testing various agents as potential cancer drugs. He never worked with anthrax or any infectious disease, according to Dr. Bach Ardalan, a professor of medicine at the University of Miami and Que's boss for the past three years. "There is no truth to the talk that Benito was doing anything related to microbiology," Ardalan says. "He certainly wasn't doing any sensitive kind of work that anyone would want to hurt him for."

But those facts got lost amid the confusion -- and the prevalence of very distracting details -- in the days after he died. So did the fact that he had hypertension. On the afternoon of Monday, Nov. 19, Que attended a late-afternoon lab meeting, and as it ended, he mentioned that he hadn't been feeling well. A nurse took Que's blood pressure, which was 190/110. "I wanted to admit him" to the hospital, Ardalan says, but Que insisted on going home.

Que had the habit of parking his car on Northwest 10th Avenue, a side street that Ardalan describes as being "beyond the area considered to be safe." His spot that day was in front of a house where a young boy was playing outside. Four youths approached Que as he neared his car, the boy later told the police, and there might have been some baseball bats involved. When the police arrived, they found Que unconscious. His briefcase was at his side, but his wallet was gone. His car was eventually found abandoned several miles from the scene. He was taken to the hospital, the same one at which he worked, where he spent more than a week in a coma before dying without ever regaining consciousness.

The mystery, limited to small items in local Florida papers at first, was "What killed Benito Que?" Could it have been the mugging? A CAT scan showed no signs of bony fracture. In fact, there were no scrapes or bruises or other physical signs of assault. Perhaps he died of a stroke? His brain scan did show a "huge intracranial bleed," Ardalan says, which would have explained his earlier headache, and his high blood pressure would have made a stroke likely.

In other words, this man just happened to be mugged when he was a stroke waiting to be triggered. That is a jarring coincidence, to be sure. But it is not one that the world was likely to have noticed if Don Wiley had not up and disappeared.

Don C. Wiley was a microbiologist. He did some work with anthrax, and a lot of work with H.I.V., and he was also quite familiar with Ebola, smallpox, herpes and influenza. At 57, he was the father of four children and a professor of biochemistry and biophysics in the department of molecular and cellular biology at Harvard.

On Nov. 15, four days before the attack on Benito Que, Wiley was in Memphis to visit his father and to attend the annual meeting of the scientific advisory board of St. Jude's Research Hospital, of which he was a member. At midnight, he was seen leaving a banquet at the Peabody Hotel in downtown Memphis. Friends and colleagues say he had a little to drink but did not appear impaired, and they remember him as being in a fine mood, looking forward to seeing his wife and children, who were about to join him for a short vacation.

Wiley's father lives in a Memphis suburb, and that is where Wiley should have been headed after the banquet. Instead, his car was found facing in the opposite direction on the Hernando DeSoto Bridge, which spans the Mississippi River at the border of Tennessee and Arkansas. When the police found the car at 4 a.m., it was unlocked, the keys were in the ignition and the gas tank was full. There was a

scrape of yellow paint on the driver's side, which appeared to come from a construction sign on the bridge, and a right hubcap was missing on the passenger side, where the wheel rims were also scraped. There was no sign, however, of Don Wiley.

The police trawled the muddy Mississippi, but they didn't really expect to find him. Currents run fast at that part of the river, and a body would be quickly swept away. At the start of the search, they thought he might have committed suicide; others had jumped from the DeSoto Bridge over the years. Detectives searched Wiley's financial records, his family relationships, his scientific research -- anything for a hint that the man might have had cause to take his own life.

Finding nothing, the investigation turned medical. Wiley, they learned, had a seizure disorder that he had hidden from all but family and close friends. He had a history of two or three major episodes a year, his wife told investigators, and the condition was made worse when he was under stress or the influence of alcohol. Had Wiley, who could well have been tired, disoriented by bridge construction and under the influence of a few drinks, had a seizure that sent him over the side of the bridge?

That was the theory the police spoke of in public, but they were also considering something else. The week that Wiley disappeared coincided with the peak of anthrax fear throughout the country. Tainted letters appeared the month before at the Senate and the House of Representatives. Two weeks earlier, a New York City hospital worker died of inhaled anthrax. Memphis was not untouched by the scare; a federal judge and two area congressmen each received hoax letters. Could it be mere chance that this particular scientist, who had profound knowledge of these microbes, had disappeared at this time?

"The circumstances were peculiar," says George Bolds, a spokesman for the Memphis bureau of the F.B.I., which was called in to assist. "There were questions that had to be asked. Could he have been kidnapped because his scientific abilities would have made him capable of creating anthrax? Or maybe he'd had some involvement in the mailing of the anthrax, and he'd disappeared to cover his tracks? Did his co-conspirators grab him and kill him?

"We were in new territory," Bolds continued. "Just because something is conceivable doesn't mean it's actually happened, but at the same time, just because it's never happened before doesn't mean it can't happen. People's ideas of what is possible definitely changed on Sept. 11. People feel less secure and less safe. I'm not sure that they're at greater risk than they were before. Maybe they're just more aware of the risk they are actually at."

As a species, we appear to be biologically programmed to see patterns and conspiracies, and this tendency increases when we sense that we're in danger. "We are hard-wired to overreact to coincidences," says Persi Diaconis. "It goes back to primitive man. You look in the bush, it looks like stripes, you'd better get out of there before you determine the odds that you're looking at a tiger. The cost of being flattened by the tiger is high. Right now, people are noticing any kind of odd behavior and being nervous about it."

Adds John Allen Paulos: "Human beings are pattern-seeking animals. It might just be part of our biology that conspires to make coincidences more meaningful than they really are. Look at the natural world of rocks and plants and rivers: it doesn't offer much evidence for superfluous coincidences, but primitive man had to be alert to all anomalies and respond to them as if they were real."

For decades, all academic talk of coincidence has been in the context of the mathematical. New work by scientists like Joshua B. Tenenbaum, an assistant professor in the department of brain and cognitive sciences at M.I.T., is bringing coincidence into the realm of human cognition. Finding connections is not only the way we react to the extraordinary, Tenenbaum postulates, but also the way we make sense of our ordinary world. "Coincidences are a window into how we learn about things," he says. "They show us how minds derive richly textured knowledge from limited situations."

To put it another way, our reaction to coincidence shows how our brains fill in the factual blanks. In an optical illusion, he explains, our brain fills the gaps, and although people take it for granted that seeing is believing, optical illusions prove that's not true. "Illusions also prove that our brain is capable of imposing structure on the world," he says. "One of the things our brain is designed to do is infer the causal structure of the world from limited information."

If not for this ability, he says, a child could not learn to speak. A child sees a conspiracy, he says, in that others around him are obviously communicating and it is up to the child to decode the method. But these same mechanisms can misfire, he warns. They were well suited to a time of cavemen and tigers and can be overloaded in our highly complex world. "It's why we have the urge to work everything into one big grand scheme," he says. "We do like to weave things together.

"But have we evolved into fundamentally rational or fundamentally irrational creatures? That is one of the central questions."

We pride ourselves on being independent and original, and yet our reactions to nearly everything can be plotted along a predictable spectrum. When the grid is coincidences, one end of the scale is for those who believe that these are entertaining events with no meaning; at the other end are those who believe that coincidence is never an accident.

The view of coincidence as fate has lately become something of a minitrend in the New Age section of bookstores. Among the more popular authors is SQuire Rushnell (who, in the interest of marketing, spells his first name with a capital Q). Rushnell spent 20 years producing such television programs as "Good Morning America" and "Schoolhouse Rock." His fascination with coincidence began when he learned that both John Adams and Thomas Jefferson died on the same July 4, 50 years after the ratification of the Declaration of Independence.

"That stuck in my craw," Rushnell says, "and I couldn't stop wondering what that means." And so Rushnell wrote "When God Winks: How the Power of Coincidence Guides Your Life." The book was published by a small press shortly before Sept. 11 and sold well without much publicity. It will be rereleased with great fanfare by Simon & Schuster next month. Its message, Rushnell says, is that "coincidences are signposts along your universal pathway. They are hints that you are going in the right direction or that you should change course. It's like your grandmother sitting across the Thanksgiving table from you and giving you a wink. What does that wink mean? 'I'm here, I love you, stay the course.'"

During my interview with Rushnell, I told him the following story: On a frigid December night many years ago, a friend dragged me out of my warm apartment, where I planned to spend the evening in my bathrobe nursing a cold. I had to come with her to the movies, she said, because she had made plans with a pal from her office, and he was bringing a friend for me to meet. Translation: I was expected to show up for a last-minute blind date. For some reason, I agreed to go, knocking back a

decongestant as I left home. We arrived at the theater to find that the friend who was supposed to be my "date" had canceled, but not to worry, another friend had been corralled as a replacement. The replacement and I both fell asleep in the movie (I was sedated by cold medicine; he was a medical resident who had been awake for 36 hours), but four months later we were engaged, and we have been married for nearly 15 years.

Rushnell was enthralled by this tale, particularly by the mystical force that seemed to have nudged me out the door when I really wanted to stay home and watch "The Golden Girls." I know that those on the other end of the spectrum -- the scientists and mathematicians -- would have offered several overlapping explanations of why it was unremarkable.

There are, of course, the laws of big numbers and small numbers -- the fact that the world is simultaneously so large that anything can happen and so small that weird things seem to happen all the time. Add to that the work of the late Amos Tversky, a giant in the field of coincidence theory, who once described his role in this world as "debugging human intuition." Among other things, Tversky disproved the "hot hand" theory of basketball, the belief that a player who has made his last few baskets will more likely than not make his next. After examining thousands of shots by the Philadelphia 76ers, he proved that the odds of a successful shot cannot be predicted by the shots that came before.

Tversky similarly proved that arthritis sufferers cannot actually predict the weather and are not in more pain when there's a storm brewing, a belief that began with the ancient Greeks. He followed 18 patients for 15 months, keeping detailed records of their reports of pain and joint swelling and matching them with constantly updated weather reports. There was no pattern, he concluded, though he also conceded that his data would not change many people's beliefs.

We believe in such things as hot hands and arthritic forecasting and predestined blind dates because we notice only the winning streaks, only the chance meetings that lead to romance, only the days that Grandma's hands ache before it rains. "We forget all the times that nothing happens," says Ruma Falk, a professor emeritus of psychology at the Hebrew University in Jerusalem, who studied years ago with Tversky. "Dreams are another example," Falk says. "We dream a lot. Every night and every morning. But it sometimes happens that the next day something reminds you of that dream. Then you think it was a premonition."

Falk's work is focused on the question of why we are so entranced by coincidence in the first place. Her research itself began with a coincidence. She was on sabbatical in New York from her native Israel, and on the night before Rosh Hashana she happened to meet a friend from Jerusalem on a Manhattan street corner. She and the friend stood on that corner and marveled at the coincidence. What is the probability of this happening? she remembers wondering. What did this mean?

"How stupid we were," Falk says now, "to be so surprised. We related to all the details that had converged to create that moment. But the real question was what was the probability that at some time in some place I would meet one of my circle of friends? And when I told this story to others at work, they encoded the events as two Israelis meeting in New York, something that happens all the time."

Why was her experience so resonant for her, Falk asked herself, but not for those around her? One of the many experiments she has conducted since then proceeded as follows: she visited several large university classes, with a total of 200 students, and asked each student to write his or her birth date

on a card. She then quietly sorted the cards and found the handful of birthdays that students had in common. Falk wrote those dates on the blackboard. April 10, for instance, Nov. 8, Dec. 16. She then handed out a second card and asked all the students to use a scale to rate how surprised they were by these coincidences.

The cards were numbered, so Falk could determine which answers came from respondents who found their own birth date written on the board. Those in that subgroup were consistently more surprised by the coincidence than the rest of the students. "It shows the stupid power of personal involvement," Falk says.

The more personal the event, the more meaning we give it, which is why I am quite taken with my story of meeting my husband (because it is a pivotal moment in my life), and why SQuire Rushnell is also taken with it (because it fits into the theme of his book), but also why Falk is not impressed at all. She likes her own story of the chance meeting on a corner better than my story, while I think her story is a yawn.

The fact that personal attachment adds significance to an event is the reason we tend to react so strongly to the coincidences surrounding Sept. 11. In a deep and lasting way, that tragedy feels as if it happened to us all.

Falk's findings also shed light on the countless times that pockets of the general public find themselves at odds with authorities and statisticians. Her results might explain, for instance, why lupus patients are certain their breast implants are the reason for their illness, despite the fact that epidemiologists conclude there is no link, or why parents of autistic children are resolute in their belief that childhood immunizations or environmental toxins or a host of other suspected pathogens are the cause, even though experts are skeptical. They might also explain the outrage of all the patients who are certain they live in a cancer cluster, but who have been told otherwise by researchers.

Let's be clear: this does not mean that conspiracies do not sometimes exist or that the

environment never causes clusters of death. And just as statistics are often used to show us that we should not be surprised, they can also prove what we suspect, that something is wrong out there.

"The fact that so many suspected cancer clusters have turned out to be statistically insupportable does not mean the energy we spent looking for them has been wasted," says Dr. James M. Robins, a professor of epidemiology and biostatistics at Harvard and an expert on cancer clusters. "You're never going to find the real ones if you don't look at all the ones that don't turn out to be real ones."

Most often, though, coincidence is a sort of Rorschach test. We look into it and find what we already believe. "It's like an archer shooting an arrow and then drawing a circle around it," Falk says. "We give it meaning because it does mean something -- to us."

Vladimir Pasechnik was 64 when he died. His early career was spent in the Soviet Union working at Biopreparat, the site of that country's biological weapons program. He defected in 1989 and spilled what he knew to the British, revealing for the first time the immense scale of Soviet work with anthrax, plague, tularemia and smallpox.

For the next 10 years, he worked at the Center for Applied Microbiology and Research, part of

Britain's Department of Health. Two years ago, he left to form Regma Biotechnologies, whose goal was to develop treatment for tuberculosis and other infectious disease. In the weeks before he died, Pasechnik had reportedly consulted with authorities about the growing anthrax scare. Despite all these intriguing details, there is nothing to suggest that his death was caused by anything other than a stroke.

Robert Schwartz's death, while far more dramatic and bizarre, also appears to have nothing to do with the fact that he was an expert on DNA sequencing and analysis. On Dec. 10 he was found dead on the kitchen floor of his isolated log-and-fieldstone farmhouse near Leesburg, Va., where he had lived alone since losing his wife to cancer four years ago and his children to college. Schwartz had been stabbed to death with a two-foot-long sword, and his killer had carved an X on the back of his neck.

Three friends of Schwartz's college-age daughter were soon arrested for what the prosecutor called a "planned assassination"; two of the trials for first-degree murder are scheduled for this month. A few weeks later, police arrested the daughter as well. One suspect has a history of mental illness, and their written statements to police talk of devil worship and revenge. There is no talk, however, of microbiology.

On the same day that Schwartz died, Set Van Nguyen, 44, was found dead in an air-locked storage chamber at the Australian Commonwealth's Scientific and Industrial Research Organization's animal diseases facility in Geelong. A months-long internal investigation concluded that a string of equipment failures had allowed nitrogen to build up in the room, causing Nguyen to suffocate. Although the center itself dealt with microbes like mousepox, which is similar to smallpox, Nguyen himself did not. "Nguyen was in no way involved in research into mousepox," says Stephen Prowse, who was the acting director of the Australian lab during the investigation. "He was a valued member of the laboratory's technical support staff and not a research scientist."

Word of all these deaths (though not the specific details) found its way to Ian Gurney, a British writer. Gurney is the author of "The Cassandra Prophecy: Armageddon Approaches," a book that uses clues from the Bible to calculate that Judgment Day will occur in or about the year 2023. He is currently researching his second book, which is in part about the threat of nuclear and biological weapons, and after Sept. 11 he entered a news alert request into Yahoo, asking to be notified whenever there was news with the key word "microbiologist."

First Que, then Wiley, then Pasechnik, Schwartz and Nguyen popped up on Gurney's computer. "I'm not a conspiracy theorist," says the man who has predicted the end of the world, "but it certainly did look suspicious." Gurney compiled what he had learned from these scattered accounts into an article that

he sent to a number of Web sites, including Rense.com, which tracks U.F.O. sightings worldwide. "Over the past few weeks," Gurney wrote, "several world-acclaimed scientific researchers specializing in infectious diseases and biological agents such as anthrax, as well as DNA sequencing, have been found dead or have gone missing."

The article went on to call Benito Que, the cancer lab technician, "a cell biologist working on infectious diseases like H.I.V.," and said that he had been attacked by four men with a baseball bat but did not mention that he suffered from high blood pressure. It then described the disappearance of Wiley without mentioning his seizure disorder and the death of Pasechnik without saying that he had suffered a stroke. It gave the grisly details of Schwartz's murder, but said nothing of the arrests of his

daughter's friends. Nguyen, in turn, was described as "a skilled microbiologist," and it was noted that he shared a last name with Kathy Nguyen, the 61-year-old hospital worker who just happened to be the one New Yorker to die of anthrax.

Of course, there have always been rumors based on skewed historical fact. Recall, for example, the list of coincidences that supposedly linked the deaths of Presidents Lincoln and Kennedy. It goes, in part, like this: The two men were elected 100 years apart; their assassins were born 100 years apart (in fact, 101 years apart); they were both succeeded by men named Johnson; and the two Johnsons were born 100 years apart. Their names each contain seven letters; their successors' names each contain 13 letters; and their assassins' names each contain 15 letters. Lincoln was shot in a theater and his assassin ran to a warehouse, while Kennedy was shot from a warehouse and his assassin ran to a theater. Lincoln, or so the story goes, had a secretary named Kennedy who warned him not to go to the theater the night he was killed (for the record, Lincoln's White House secretaries were named John Nicolay and John Hay, and Lincoln regularly rejected warnings not to attend public events out of fear for his safety, including his own inauguration); Kennedy, in turn, had a secretary named Lincoln (true, Evelyn Lincoln) who warned him not to go to Dallas (he, too, was regularly warned not to go places, including San Antonio the day before his trip to Dallas).

I first read about these connections five years after the Kennedy assassination, when I was 8, which says something about how conspiracy theory speaks to the child in all of us. But it also says something about the technology of the time. The numerological coincidences from the World Trade Center that I mentioned at the start of this article made their way onto my computer screen by Sept. 15, from a friend of a friend of a friend of an acquaintance, ad infinitum and ad nauseam.

Professor Robins of Harvard points out that "the Web has changed the scale of these things." Had there been a string of dead scientists back in 1992 rather than 2002, he says, it is possible that no one would have ever known. "Back then, you would not have had the technical ability to gather all these bits and pieces of information, while today you'd be able to pull it off. It's well known that if you take a lot of random noise, you can find chance patterns in it, and the Net makes it easier to collect random noise."

The Gurney article traveled from one Web site to the next and caught the attention of Paul Sieveking, a co-editor of Fortean Times, a magazine that describes itself as "the Journal of Strange Phenomena."

"People send me stuff all the time," Sieveking says. "This was really interesting." Wearing his second hat as a columnist for the The Sunday Telegraph in London, he wrote a column on the subject for that paper titled "Strange but True -- The Deadly Curse of the Bioresearchers." His version began with the link between the two Nguyens and concluded, "It is possible that nothing connects this string of events, but . . . it offers ample fodder for the conspiracy theorist or thriller writer."

Commenting on the story months later, Sieveking says: "It's probably just a random clumping, but it just happens to look significant. We're all natural storytellers, and conspiracy theorists are just frustrated novelists. We like to make up a good story out of random facts."

Over the months, Gurney added names to his list and continued to send it to virtual and actual publications around the U.S. Mainstream newspapers started taking up the story, including an alternative weekly in Memphis, where interest in the Wiley case was particularly strong, and most recently The Toronto Globe and Mail. The tally of "microbiologists" is now at 11, give or take, depending on the story you read. In addition to the men already discussed, the names that appear

most often are these: Victor Korshunov, a Russian expert in intestinal bacteria, who was bashed over the head near his home in Moscow; Ian Langford, a British expert in environmental risk and disease, who was found dead in his home near Norwich, England, naked from the waist down and wedged under a chair; Tanya Holzmayer, who worked as a microbiologist near San Jose and was shot seven times by a former colleague when she opened the door to a pizza delivery man; David Wynn-Williams, who studied microbes in the Antarctic and was hit by a car while jogging near his home in Cambridge, England; and Steven Mostow, an expert in influenza, who died when the plane he was piloting crashed near Denver.

The stories have also made their way into the e-mail in-boxes of countless microbiologists. Janet Shoemaker, director of public and scientific affairs for the American Society for Microbiology, heard the tales and points out that her organization alone has 41,000 members, meaning that the deaths of 11 worldwide, most of whom were not technically microbiologists at all, is not statistically surprising. "We're saddened by anyone's death," she says. "But this is just a coincidence. In another political climate I don't think anyone would have noticed."

Ken Alibek heard them, too, and dismissed them. Alibek is one of the country's best-known microbiologists. He was the No. 2 man at Biopreparrat (where Victor Pasechnik also worked) before he defected and now works with the U.S. government seeking antidotes for the very weapons he developed. Those who have died, he says, did not really know anything about biological weapons, and if there were a conspiracy to kill scientists with such knowledge, he would be dead. "I considered all this a little artificial, because a number of them couldn't have been considered B.W. experts," he says with a hint of disdain. "I got an e-mail from Pasechnik before he died, and he was working on a field completely different from this. People say to me, 'Ken, you could be a target,' but if you start thinking about this, then your life is over. I'm not saying I'm not worried, but I'm not paying much attention. I'm opening my mail as usual. If I see something suspicious, I know what to do."

Others are not quite as sanguine. Phyllis Della-Latta is the director of clinical microbiology services at New York's Columbia Presbyterian Medical Center. She found an article on the deaths circulating in the most erudite place -- an Internet discussion group of directors of clinical microbiology labs around the world. These are the people who, when a patient develops suspicious symptoms, are brought in to rule out things like anthrax.

Della-Latta, whom I know from past medical reporting, forwarded the article to me with a note: "See attached. FYI. Should I be concerned??? I'm off on a business trip to Italy tomorrow & next week. If I don't return, write my obituary."

She now says she doesn't really believe there is any connection between the deaths. "It's probably only coincidence," she says, then adds: "But if we traced back a lot of things that we once dismissed as coincidence -- foreigners taking flying lessons -- we would have found they weren't coincidence at all. You become paranoid. You have to be."

Don Wiley's body was finally found on Dec. 20, near Vidalia, La., about 300 miles south of where he disappeared.

The Memphis medical examiner, O.C. Smith, concluded that yellow paint marks on Wiley's car suggest that he hit a construction sign on the Hernando DeSoto Bridge, as does the fact that a hubcap was missing from the right front tire. Smith's theory is that heavy truck traffic on the bridge can set off wind gusts and create "roadway bounce," which might have been enough to cause Wiley to lose

his balance after getting out of the car to inspect the scrapes. He was 6-foot-3, and the bridge railing would have only come up to mid-thigh.

"If Dr. Wiley were on the curb trying to assess damage to his car, all of these factors may have played a role in his going over the rail," Smith said when he issued his report. Bone fractures found on the body support this theory. Wiley suffered fractures to his neck and spine, and his chest was crushed, injuries that are consistent with Wiley's hitting a support beam before he landed in the water.

The Wiley family considers this case closed. "These kinds of theories are something that's always there," says Wiley's wife, Katrin Valgeirsdottir, who has heard all the rumors. "People who want to believe it will believe it, and there's nothing anyone can say."

The Memphis Police also consider the case closed, and the local office of the F.B.I. has turned its attention to other odd happenings. The talk of Memphis at the moment is the bizarre ambush of the city's coroner last month. He was wrapped in barbed wire and left lying in a stairwell of the medical examiner's building with a live bomb strapped to his chest.

Coincidentally, that coroner, O.C. Smith, was also the coroner who did the much-awaited, somewhat controversial autopsy on Don Wiley.

What are the odds of that?

The numbers 9/11 (9 plus 1 plus 1) equal 11, and American Airlines Flight 11 was the first to hit the twin towers, and there were 92 people on board (9 plus 2), and Sept. 11 is the 254th day of the year (2 plus 5 plus 4).; What of the deaths of nearly a dozen scientists? Is it really possible that they all just happened to die, most in such jarring ways, within so short a time?; The fact that personal attachment adds significance to an event is the reason we tend to react so strongly to the coincidences surrounding Sept. 11. In a deep and lasting way, that tragedy feels as if it happened to us all.; Presidents Kennedy and Lincoln were elected 100 years apart. Both men were succeeded by Johnsons, who were also born 100 years apart. Their names each contain seven letters. Their successors' names each contain 13 letters. Their assassins's names each contain 15 letters.; In a room of 23 people, the odds are even that two of them will have the same birthday. Reduce the occupants to 14, and it's even money that two of them were born within one day of each other. And for a 50-50 chance of finding a pair with birthdays a week apart, you need to invite only seven to the party.

CAPTIONS: Photos: On March 5, two elderly twin brothers in Raahe, Finland, set out separately on their bicycles to do errands. Within the space of two hours, both were hit and killed by two separate trucks in two separate accidents on the same stretch of highway. (The Raahe, Finland, Police Department); (Corbis); (Edward Keating/The New York Times)

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