SECTION K
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After a near-fatal crash, professor Bill Zoller struggles to fill a 20-year gap in his memory

Starting over

by Bill Dietrich
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Like a modern-day Rip Van Winkle, University of Washington chemistry professor Bill Zoller woke from a 1987 auto accident with 20 years of his memory missing.

His multiple trips to Antarctica? His participation with the first teams of scientists to enter the steaming craters of Mount St. Helens and El Chichon in Mexico? His 150 research papers? His 50-yard ride on the breakaway crust of a lava flow in Iceland? The daredevil stunts that earned him the nickname "Wild- Bill"?

Zoller can't remember.

Watergate. The fall of Saigon. Gerald Ford. Jimmy Carter. All the politics, history and scientific advancement since 1967 are mostly gone.

"To me, the Vietnam War is just starting," the 48-year-old said over lunch at the U District's College Inn, the one off-campus restaurant he visits now because the path to it is the one route he has memorized. "Ronald Reagan is a B-class actor. He was president? You've got to be kidding me."

He remembers his children as infants, and re-met them grown: 18 and 19 now. He remembers courting and marrying his wife, Vivian, and re-met her aged 20 years in an instant.

"You're not Vivian," he told her once in the confusion of his recovery. "You're too old."

He remembers all the facts and theories and formulas of the chemistry he knew in the 1960s, but is painfully re-learning the advances since then. Shelves in his office are taken up by the studies he wrote, but he can't remember what's in them.

Yet students rate his lectures among the highest of any professor in the UW's chemistry department.

> You'd talk and he'd respond, but that was it. He couldn't pull anything out for himself. He couldn't remember what he had done 10 seconds before.
>
> – **VIVIAN ZOLLER**
> **professor's wife**

By all accounts Zoller should be dead. Or, if not dead, a vegetable. Or, if not a vegetable, then permanently disabled. Skidding on black ice in Janua 1987, his car was hit so hard by another vehicle that Zoller broke both his seatbelt and his pelvis. His ribs were smashed, his lungs collapsed. His trunk organs were flipped upside down. His brain sustained two enormous blood clots.

Doctors were pessimistic he'd ever recover, He was in a coma for a week.

But with the help of his family, physicians, therapists, colleagues and friends, he has fought off near-suicidal depression since

the 1987 accident and worked to recapture that most central thing of self, his mind.

Zoller compares what happened to himself to losing the directory to a computer hard disk, or a library without a card catalog. The data was still there. What has been painfully pieced back together is the ability to access it.

He re-learned to walk, read, lecture, travel, eat with table manners, hold a conversation. It was a major victory when he woke one morning and remembered his own name. He still studies a black appointment book every mornin to remind himself of what he has to do. If he strays from memorized routes, he is easily disoriented.

Emotionally and intellectually, gaps remain. He rarely understands humor anymore. He often can't separate kidding remarks from serious ones, or understand colloquialisms. When his wife told him once to "keep your pants on," he looked down in alarm at his legs.

"Mentally I'm more like a teenager now," he assesses: preoccupied with his own problems and painfully rebuilding relationships to others. "I'm nowhere near back."

But he has so recaptured his speaking skills that 300 students pack each of his freshman chemistry lectures. Offstage, his assistant Mary Harty noted, the reawakened Bill Zoller is far more nervous and uncertain than the old. "The private Bill is more vulnerable than before," she said.

But onstage his old persona seems to take over automatically, and he gives a performance that draws laughs, gasps and jolts. In a typical 50 minutes, he charts radioactive decay with a clattering Geiger counter, makes a bang by setting of f potassium chloride with a hammer, compares chemical

energy to nuclear, jumps to reactor safety, and produces nervous murmurs by pointing out the radioactivity in cigarette smoke.

The talk is punctuated by the explosion of paper soaked in nitrogen dioxide, sendin up a column of purple smoke. "That's the k•i n d of thing he likes to do," student Lynn Roediger said in explainin his popularity.

The written ratings students give after his quarter-long classes are mostly raves, and to Zoller nothing is more satisfying.

"Most people never get a second start in life," he said. "I have. I thank the Lord he gave my life back after it was one. I'm concentrating on teaching now. I k n ow the Lord wants me to do this."

He is particularly excited about supervising a "Science Outreach" program that sends college science students into high school to ignite interest in environmental issues. Having been given back his own life, he wants to pass on h is love of chemistry to others.

Bill Cannon, science writer for the UW's Office of News and Information Services, dubbed it "Zoller's Gift."

None of this would have been possible without a remarkable supporting cast. His wife and children struggled to adjust to a stranger. A genius with a national reputation as a volcanic and atmospheric chemist had been turned, emotionally and intellectually, into a near infant.

The change was stunning. "You'd talk and he'd respond, but that was it," Vivian

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■ Memory loss and recovery is a little-understood phenomenon. K 2

Struggling to fill the gaps in his memory

Zoller was angry at the seemingly jumbled wiring in his head.

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Zoller recalled. "He couldn't pull anything out for himself. He couldn't remember what he had done 10 seconds before."

He slept more than 12 hours a day after returning from the hospital. He'd awaken panicked in the night. He seemed asthmatic, but his respirator worked at clearing his breathing whether it held any medication or not.

Zoller was angry at the seemingly jumbled wiring in his head. Once while riding in the family car he was seized by fear: "All these trees are flashing past!" he cried. His brain could not recognize at first it was the car, not the surrounding landscape, that was moving.

He was upset at the 20-year leap in prices he'd see in stores and restaurants, becoming too flustered to use a menu. When the couple dined out, his ears didn't do the natural filtering of conversations from surrounding tables. He'd sometimes reply to remarks made across the room.

Zoller lost all self-confidence and contemplated suicide. The one good thing, he thought, was that he couldn't remember the pain of the accident.

In despair, Vivian turned to friends at Bothell Foursquare Church. "I decided God gave me this job for the moment," she said. "Jesus did tell me that if I stuck with it, things would be better than before."

Pastor Bill Hill re-introduced Zoller to the Bible and put him together with 7 1 -year-old Bryce Lilly of Tacoma, a survivor of the Bataan Death March and three years of Japanese imprisonment.

Lilly was not impressed with what he saw. "Bill stood kind of slumped and down," Lilly recalled. It was a look he recalled from prison camp. When new inmates came in looking like that, bets were made on how long they'd

take to die.

Lilly, a boxing champion before his capture, put Zoller on an exercise program. Push-ups, sit-ups, running, rowing. Vivian bought him a rowing machine.

Zoller worked up from a handful of push-ups to 250 a day in groups of 15, plus 150 sit-ups. He'd run three miles.

"As the exercise progressed, he started staring straight ahead and stood straighter," Lilly said. "Attitude is so important."

One morning Zoller woke up next to his wife. "You know, I want to live," he told her.

The experience has made him deeply religious; he has since read the entire Bible three times. "He saw the miracle unfold," said Hill. "He gives that credit to God."

It wasn't the first turnaround for Zoller. He was a D student in high school in Alaska, ignoring his studies to hunt and fish. Let into the University of Alaska on a probationary basis, he suddenly started studying and pulled straight A's his first quarter. He was the first chemistry student from the school to go on to graduate work at the Massachusetts Institute of Technology, and at MIT he won a Kodak Prize as the top doctoral chemistry student there.

With this second test, achievement has come less easily. To start him reading again, Vivian gave him an elementary-school primer. The words clicked open a combination in his brain. He began racing through the readers, at a rate of about one school grade per week.

To exercise his memory he would count the red and green lights he encountered on the way to his job at the UW, writing them down in his notebook. If the tally he remembered at the end of the trip was the same he had recorded, he was elated.

He kept a black notebook to remind him of essential things. For a while, he would look at it each morning to remember his name. Names and phone numbers for his wife, doctors, pastor and Lilly were

included in case he became lost or confused.

He still keeps a meticulous calendar in it so he can remember where he is supposed to be. He studies it each morning when he wakes, slowly recalling what each entry means.

Zoller has pushed himself. He was teaching again nine months after his accident. This past summer he worked at Lawrence Livermore Laboratory in California. His lectures around the nation on volcanoes and atmospheric pollution have become some of the most popular offered by the American Chemical Society. In September he traveled to Europe on his own to give a series of lectures. The travel scared him more than the speaking; he panicked in London's airport about changing money and didn't eat for 20 hours to avoid the test.

Zoller's current neurologist and psychiatrist declined to comment in any detail on his case, but John Maxwell, Zoller's first neurosurgeon, said the inch-wide holes the accident left in the chemist's brain were a particularly devastating injury.

"One of the most frustrating things is people who are left with enough capacity so they recognize that they can't do what they did before," Maxwell said. Zoller's conceptual thinking, crucial to a research scientist, was particularly hard hit, he said.

Recovery of basic functions like talking or walking may be rapid, Maxwell said, but higher brain functions can take two or more years to come back, if at all.

Vivian rejected one physician's sugestion for experiments on her husband. "He wanted me to pay him money to play with Bill's brain," she said.

This is not a story with a happy ending. It is a story still going on. Zoller's next goal is to once more contribute to research. But his memory is still like shards of glass, gradually being re-pieced into a cathedral window.

"I have been mommy and nursemaid," Vivian Zoller said. "Now we are re-learning how to be husband and wife."

"I remember the very first lecture I ever gave," Zoller said. "But the moment a lecture is over now, I don't remember giving it." A chance meeting with a colleague can make him forget an appointment. If he sets down his notes or glasses, he may forget to pick them up when he walks away.

What he does clearly remember, and what he clings to like an anchor, is a reason for fighting back from the near-dead. "My job is to help young people," he said. "That is what I was saved for."