

# Scientists try to harness super-winds that once carried bombs

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The man from the Forest Service burst into the switchboard room with orders for the young operator. Keep quiet, he told Cora Conner, 16. Stay put.

It was May 5, 1945. Six people lay dead in the nearby Oregon woods, their bodies arrayed "like spokes in a wheel," victims of a bomb attached to a balloon.

Launched in Japan, the balloon had ridden ferocious [high-altitude](#) winds discovered by a Japanese scientist.

Now, far more is known about the jet stream winds: They detonate storms, such as last winter's record snows; they have conspired in this summer's heat; they may mark the boundaries of winners and losers in a warming world; and someday they may turn on the lights in Philadelphia.

But in the final months of [World War II](#), they played a different role: They were highways of war.

This week, as the world marks the 65th anniversary of Japan's surrender, the little-known story of the balloon bombing remains vivid in the memories of a few Americans, including Cora Conner.

"I was just numb," she says. "It took me 40 years before I could talk to anybody about this."

The bomb blast in Bly, Ore., had its origins in the work of a gentle Japanese genius.

Wasaburo Ooishi, according to his granddaughter, treasured his chestnut trees and cultivated morning glories. Using pilot balloons and making 1,228 observations from March 1923 to February 1925, he became the first scientist to document high-speed winds that howl three to nine miles above Earth, where warm and cold air meet.

He published his pioneering work in Esperanto. But this "universal language" never caught on, and his findings were overlooked.

In the war, U.S. commanders relied on educated guesses about high-level winds. Preparing for a bombing raid in 1944, a team tried to forecast winds 30,000 feet over Tokyo.

"We had very little data," says a memoir by the late Reid A. Bryson, then a [meteorologist](#) stationed in Guam. He and his colleagues estimated U.S. planes would fly into west winds of 168 knots, or 193 mph.

The general who ordered the forecast called them "stupid." Surely they meant 68 knots; do it over. They came back with the same answer. Forget it, the general said. Our pilots will measure the real winds.

The result was "disastrous," Bryson wrote. "The planes couldn't fly upwind because they were practically standing still ... sitting ducks for the Japanese antiaircraft fire."

A returning pilot told Bryson that "it was strange to see the Japanese coast approaching on the radar, then to see it stand still." The winds were measured at 196 mph.

The general apologized.

Meanwhile, the same mystery was bedeviling bombers over Europe.

"Many times we got trapped on some real high winds," recalls Ed Dingivan, who flew 20 missions with the 447th Bomb Group, based near London. He remembers bombs missing targets, and ambiguous weather briefings.

"We were told that when you're up there, it's going to be very windy," says Dingivan, now 91 and living in Londonderry, N.H. "I don't remember ever hearing jet stream during the war days."

Finally, Bryson wrote, the Air Force consulted the nation's top meteorologist. The University of Chicago's Carl Gustav-Rossby said the pilots must be encountering the winds of the jet stream.

Scientists had long theorized about concentrated high-speed winds in the upper atmosphere. The phrase jet stream -- think of water pulsing from a hose -- was minted by a German meteorologist as early as 1939.

Since the war, experts have made great leaps in understanding and predicting the winds' behavior, now a standard feature of computer models that forecast weather.

But thanks to their global span and wild nature, the winds remain difficult to measure.

In recent winters, the National Oceanic and Atmospheric Administration has sent high-altitude hurricane-hunter planes over the North Pacific to "bomb" the jet stream, dropping instrument packs into the winds in an effort to unravel their secrets.

The researchers are building a much more intricate mosaic than the jet stream's likeness on TV weather maps. The mosaic -- far from complete

-- depicts a complex system of winds that circumnavigate the globe in parabolic and serpentine patterns, distorted and buckled by land masses and wild clashes of air.

Most important are the polar and subtropical jets. Both form at boundaries of warm and cold air -- the greater the contrast, the stronger the winds. They set off storms by lifting air violently skyward; think of a gust lifting smoke from a chimney and inciting the blaze in a fireplace.

Even when jet stream winds slacken in summer and settle into patterns, the result can be disastrous. Areas close to jet stream storm tracks may suffer relentless rains. Areas south of those boundaries dry out dangerously, allowing heat to build.

That happened this summer in the Eastern United States and Russia. It wreaked calamity in Europe in 2003, when heat waves killed as many as 50,000 people.

Now, jet stream winds appear to be on a subtle and possibly ominous migration, say researchers at the University of Utah and the Carnegie Institution of Washington, in Stanford, Calif.

The winds have nudged northward in the Northern Hemisphere and may be gaining in height, perhaps because of worldwide warming. Such long-term shifts would have profound impact on storm tracks and drought zones, say the Carnegie experts, including Ken Caldeira.

Caldeira and co-author Cristina Archer, examining data from 1979 to 2001, found a subtle northward shift in the polar jet, correlating with worldwide warming -- though they said it was impossible to know if it was a natural fluctuation. Caldeira and Archer, now at California State University, Chico, also recently published a paper describing the jet stream as a high-speed energy mine, holding about 100 times the world's

needs.

Archer says tapping the jet stream for electrical power is no longer merely a dream. Prototypes are in the works, though it may take a decade or more to resolve technological obstacles.

In a sense, the scientists and entrepreneurs are building on Ooishi's legacy.

Ooishi was no maker of bombs. He had merely wanted to improve weather forecasts.

But military leaders saw the potential. Retaliating for a bombing raid and desperate for a victory late in the war, they devised an attack on the United States. They conscripted schoolchildren to help by gluing together paper squares to form balloon canopies.

Japan launched more than 9,000 of the hydrogen-filled balloons, each 33 feet in diameter and equipped with altitude-control instruments and incendiary devices.

The balloons were meant to reach the Pacific Northwest, drop their bombs, set off panic and forest fires, and self-destruct without leaving a trace.

The U.S. government learned of this campaign but censored reports in the press, lest the Japanese think they were succeeding.

For the most part, the balloon bombs failed. They rode the strong winds of the cool months -- the Northwest's rainy season. That put a damper on forest fires.

And the Japanese could not have accounted for the chaos reigning in the

upper atmosphere. Balloon parts were found from Alaska to Mexico, and as far east as Michigan.

Where the bombs did set fires, an all-black paratroop battalion, the 555th, was sent in. Commanders judged the "Triple Nickels" unfit for combat, recalls one of them, Walter Morris.

Serving with Morris was Malvin Brown, 25, a Main Line native. He died fighting a fire in the war's final days. Morris accompanied his remains back to Pennsylvania.

The only balloon-bomb fatalities -- the war's only fatalities inflicted on U.S. soil -- occurred that brilliant May day in the Oregon woods.

Cora Conner's family ran the town switchboard for the phone company, and it was her turn to be on duty. So her mother denied her request to go to a Sunday-school picnic with five friends who dropped by that morning.

It was a get-acquainted picnic organized by the new pastor in town, the Rev. Archie Mitchell of the Christian and Missionary Church, and his pregnant wife, Elsy.

The minister dropped his wife and the children at the picnic spot and was parking his car when the group saw a fallen balloon. Someone may have touched it -- and Mitchell witnessed the explosion.

Jack Smith, the first forest ranger to reach the scene, saw the bodies "like spokes" around a crater. Now 95, he still has the shrapnel he dug out of a pine tree that day.

Another Forest Service man went to the Bly switchboard that day to alert the military. He ordered Cora Conner to stay in the room and not even

tell her family.

"I was there early in the morning until late at night," she remembers. "People were yelling at me. ... They pounded on the door and the window."

In interviews with documentary filmmaker Ilana Sol, Japanese women who made the balloons said they did so to help the war effort. They did not know of the deaths in Bly until many years later.

In 1996, four of those women were invited to Bly. Their visit is depicted in Sol's documentary, "On Paper Wings."

Archie Mitchell did not live to witness the reconciliation. After the bombing, he married Betty Patzke, sister of two of the victims. He and his wife later went to Vietnam to work at a leprosarium, but he was captured by Viet Cong in 1962 and never seen again.

Betty Mitchell did participate in the Bly meeting. She says the bombing and her husband's capture were "part of God's plan."

Cora Conner, now 81, has forgiven the Japanese women -- as well as the man who pounded hardest on the door that day, "shaking his fists and screaming."

He was Ed Patzke, the older brother of two victims.

Later on, he apologized to her, Conner says -- "and we cried and cried and cried."

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