


The Newscastle

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U.S. Army Corps
of Engineers
Los Angeles District

 marks the spot(s)



To the left is an aerial view of one of the giant markers that cross the Arizona landscape. Treasure markers in the desert? Find out on page __.

“All I wanna do is, is, is know what’s going on.... This means something. This is important.”

*--Utility lineman Roy Neary,
“Close Encounters of the Third Kind”*

Cold war secrets decoded in the hot Arizona desert

Story by Mike Tharp, photos by Leslie Owen

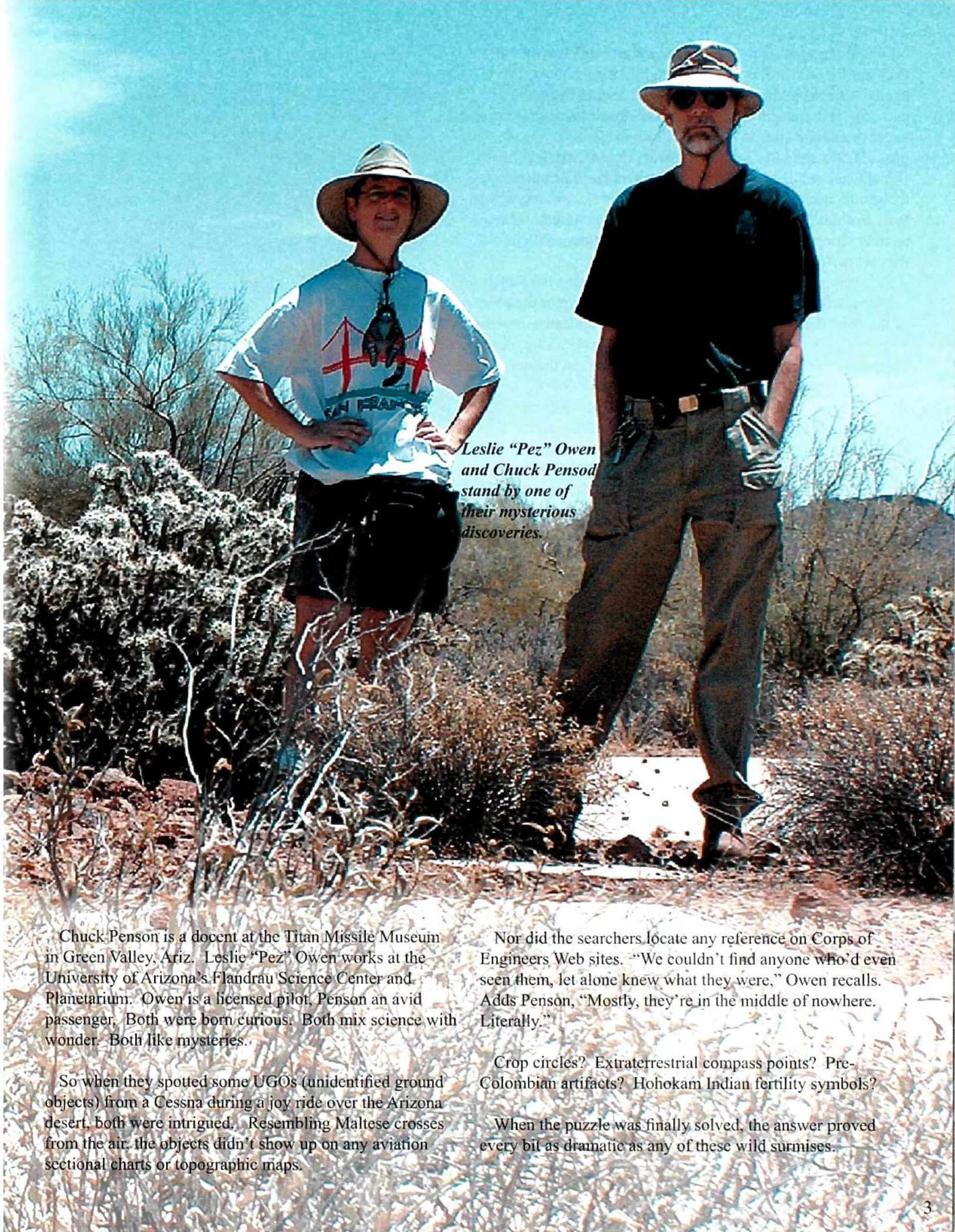
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On the cover: Giant maltese crosses in the desert make for a hot Arizona mystery.





Leslie "Pez" Owen and Chuck Pensod stand by one of their mysterious discoveries.

Chuck Pensod is a docent at the Titan Missile Museum in Green Valley, Ariz. Leslie "Pez" Owen works at the University of Arizona's Flandrau Science Center and Planetarium. Owen is a licensed pilot, Pensod an avid passenger. Both were born curious. Both mix science with wonder. Both like mysteries.

So when they spotted some UGOs (unidentified ground objects) from a Cessna during a joy ride over the Arizona desert, both were intrigued. Resembling Maltese crosses from the air, the objects didn't show up on any aviation sectional charts or topographic maps.

Nor did the searchers locate any reference on Corps of Engineers Web sites. "We couldn't find anyone who'd even seen them, let alone knew what they were," Owen recalls. Adds Pensod, "Mostly, they're in the middle of nowhere. Literally."

Crop circles? Extraterrestrial compass points? Pre-Colombian artifacts? Hohokam Indian fertility symbols?

When the puzzle was finally solved, the answer proved every bit as dramatic as any of these wild surmises.

First, though, other theories came and went. Their 85-year-old friend Bill Braden, who had told them about similar objects, had heard they might have once been part of a Nike missile base. But Penson knew there'd never been Nike silos in Arizona. Somebody else guessed they might be target crosshairs for a World War II practice bombing range. But viewed from a cockpit, their mile-apart, grid-like pattern looked too orderly for that. Formerly Used Defense Sites? Even after they made another recon flight, took aerial photos and enlarged them, they weren't sure.

Owen, whose nickname is "Pez," had seen eight or nine of the objects on her first solo flight. She then located a total of 28 by using U.S. Geological Survey (USGS) Terraserver aerial imagery, "clearly identifiable in the one-mile-apart square grid pattern."

A few weeks later, Owen and Penson decided to take a closer look. They had seen the faint line of a road near some of the objects, and one Sunday morning they drove down it. They dismounted some 50 miles northwest of Tucson, near Casa Grande. There, on the creased sand amid the saguaro and cholla cactus and the crucifixion thorns, they discovered three of the mysterious markers. They were designated Y56, Z56 and Z57.

Each had the concrete petals that looked like crosses from the air; each of the four petals was about 25 feet long and 18 feet wide at its larger end, overall about 50 feet in diameter; in the middle of the western edge of one petal was a manhole cover with rebar grips.

And in the center of each cross was a saucer-sized brass disk stamped: "Corps of Engineers/U.S. Army Map Service."

One of the manholes at a location marker.



After visiting the markers, Owen accessed and interpreted online data from the National Geodetic Survey, discovering that a total of 281 markers had been set in 1966 or 1967, all falling neatly into the same mile-apart square pattern. "Most of these are no longer visible," she explains, "either ploughed under or built over or simply overgrown, but at one time this grid covered a much larger area and was a huge undertaking to build."

Time for the pros from Dover. Penson e-mailed the Corps of Engineers Los Angeles District's public queue with questions about the markers ("We think there is a good story here"), and Owen shipped aerial and surface-level photos.

Aerial shots of markers taken by Pez in her Cessna.



Their inquiry was forwarded to L.A. District team members Bill Miller and Ralph Hamrick. Miller asked Hamrick to look up the history of “a series of permanent structures that resemble aerial survey markers in the Arizona desert.” Hamrick did some research and “found the formal descriptions of these three points in the National Geodetic Survey Database...which were established by the Army Map Service.”

The Army Map Service is now called the National Geospatial-Intelligence Agency (NGA), and Howard Cohen, an NGA spokesman, backtracked on the richly detailed descriptions provided by Penson and Owen. He eventually confirmed what the unidentified objects were: “Calibration markings for CORONA satellites.”



Aerial shot of a bomb target - distinctly not the same as the location markers.

A satellite view of the location markers showing how they align. (The circles were added to the photo by the editor for visibility.)



Owen and Penson had just entered *The Twilight Zone*.

The 1960-1972 super-secret CORONA program was to photoreconnaissance what George Smiley was to spy novels. During its dozen years of highly classified operations run jointly by the Air Force and CIA, CORONA launched a series of camera-toting satellites 100 miles into space. Over the life of the project, its clandestine cameras took 860,000 images on 2.1 million feet of film lodged in 39,000 cans.

Ultimately, those cameras mapped 750 million square miles of the planet’s surface, recording much of its environmental history—as well as the most militarily hostile landscapes on earth.

CORONA embodied two unique features: Its lenses focused on areas denied to conventional U.S. scrutiny—the Soviet Union, China and their client states. And the system worked by literally snatching ultrasensitive information out of the air. CORONA parachuted canisters from satellites in a recovery vehicle (called a “bucket”) holding the exposed film, to be caught in midair (“de-orbited”) at around 15,000 feet over the Pacific Ocean by Air Force planes.

(What goes around almost comes around: In September, NASA had planned to use the same basic drill to catch a reentry capsule full of solar ions after a space probe. Alas, while the Hollywood stunt pilots flying helicopters hovered over the Utah salt flats, waiting to snag the space cargo, its parachutes didn’t deploy. The capsule slammed into the ground, but scientists were able to retrieve some experimental data.)

As inventive as anything ever plotted by Heinlein, Asimov or Bradbury, CORONA combined the best and the brightest risk-takers from the military, intel agencies and the private sector. After it was conceived in 1958, such blue-chip corporations as Lockheed, Itek, General Electric and Eastman Kodak threw their formidable R&D into a project that, for national security reasons, didn't exist.

Sputnik I and II, it may be recalled, both went aloft in 1957, and a putative "missile gap" with the Soviets became an issue in the 1960 Kennedy-Nixon debates. U.S. strategic planners needed real-time data on what was happening on the ground in the Soviet Union and Communist China. U-2 spy planes chevroned the unfriendly skies, but they were vulnerable to weather, pilot fatigue and...enemy fire.

So, 110 days after Russian missiles shot down Francis Gary Powers' U-2 in 1960, CORONA burst on the Cold War horizon.

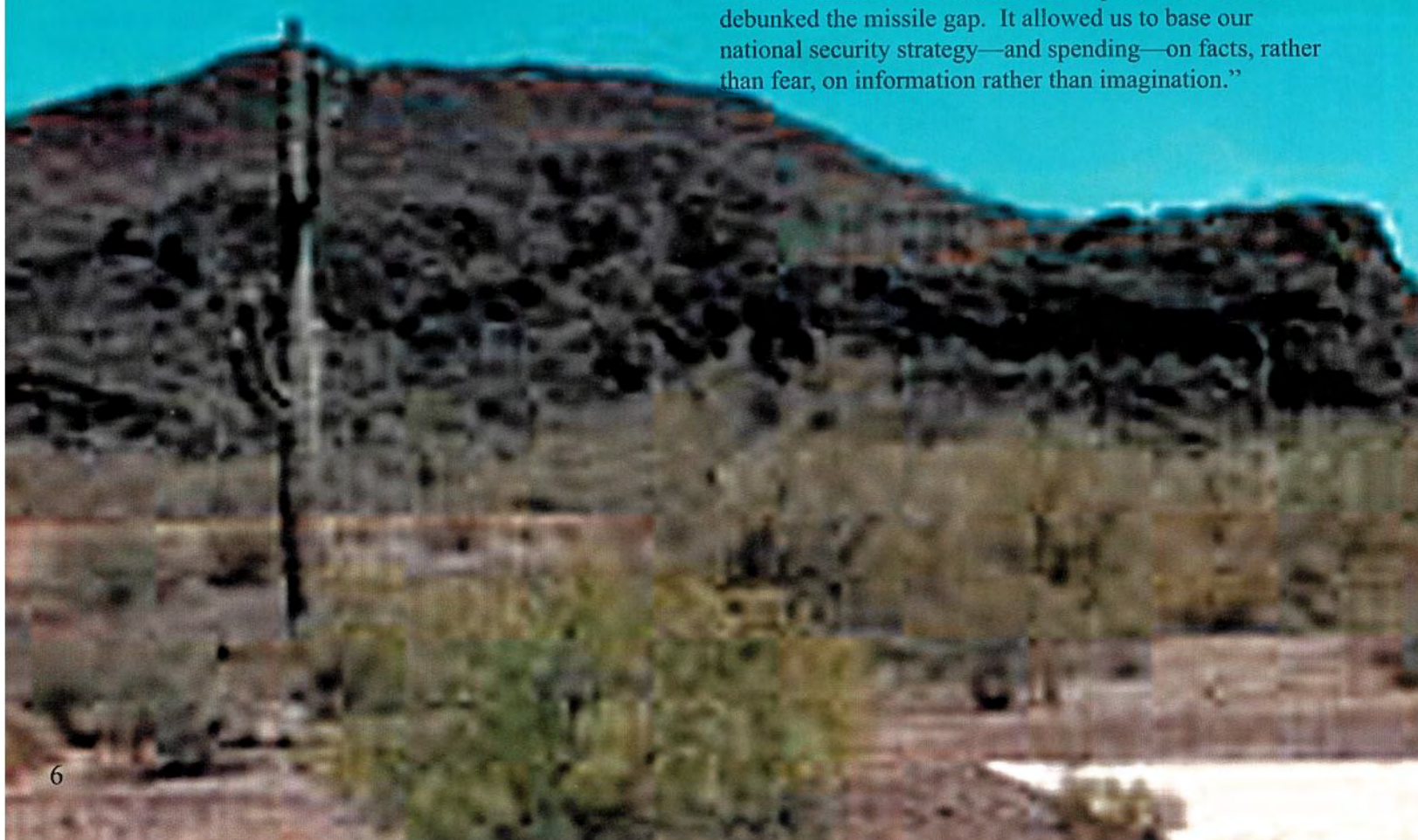
Sometimes literally. The first Thor rockets took off from California's Vandenberg AFB in 1959, but according to the Web site Dan's History (which studies technology, history and aviation), "with sickening regularity they failed, mainly due to problems with the launch vehicle, including several spectacular explosions." It wasn't until the 13th mission that "a non-camera carrying CORONA achieved orbit and returned its film canister, which was fished out of the ocean."

Mission summaries litanized the downers: "Failed to achieve orbit." "Power supply failure." "Retro rockets malfunction." "Eccentric orbit." "Capsule sank prior to retrieval." "Streaks throughout film." "Main camera malfunctioned."

But then successes started to mount in the early '60s, and from May 1966 through February 1971, 32 launches in a row were partly or totally on target. The cameras were designated KH, for keyhole, and two smaller similar projects—ARGON and LANYARD—ran concurrently in the early '60s. "Of the 145 total CORONA missions, 102 were successful," Dan's History states.

The National Reconnaissance Office (NRO), which today builds and operates the nation's recon satellites for DoD and the CIA, among other customers, has chronicled CORONA's imagery. Its very first picture showed the Soviets' Mys Shmidta Air Field on Aug. 18, 1960. Later images included a Soviet solid rocket production plant near Blysk; the Yurya ICBM complex showing construction of an SS-7 launch site; a Chinese nuclear test site at Lop Nor, showing ground zero four days after a nuclear test; and, perhaps whimsically, the Pentagon on Sept. 25, 1967.

"Such pictures held enormous significance for the course of the Cold War," said Admiral William O. Studeman, then acting director of the CIA, in a 1995 speech. "They provided information that allowed our leaders to weigh the Soviet threat and measure our response. CORONA debunked the missile gap. It allowed us to base our national security strategy—and spending—on facts, rather than fear, on information rather than imagination."



What about the Arizona markers? Pez Owen herself discovered the connection in a book about CORONA called "Eye in the Sky." On page 82 she read about a 1967 launch: "Resolution with the new camera improved to as good as six feet."

Then the falcon-eyed pilot spotted a footnote: "The resolution figures cited for the CORONA cameras represent the best figures obtained from orbit. This was usually determined from examining a resolution test target on the ground in Arizona, where the thin, clear air reduced distortion."

Dr. Robert McDonald, now director of the Center for National Reconnaissance at NRO and author of "Corona between the Sun and the Earth: The First NRO Reconnaissance Eye in Space," suggests how the markers were used: "During the developmental stage of Corona, it was important to determine if the satellite could actually find the right spot on the ground. And these may have been part of the process to calibrate the software. Back then everything had to be pre-loaded before the launch."

It thus appears that the concrete Maltese crosses and their accessories were employed, at least in part, as test targets for one of the Cold War's most secret projects.

During her hunt for clues, Owen downloaded declassified satellite photos of a 1967 launch from the USGS database. The area covered by these images was plotted on a map of Arizona, and she found that one of them nudged the edge of the target grid near Casa Grande.

Eureka. Or at least Bingo.

Unraveling the mystery has pleased others besides the two original sleuths. Marc Martin, 49, a native Arizonan who grew up on a cotton farm seven miles south of Casa Grande, remembers seeing the markers on or near his family's property. "In fact, one of them was a mere 100 yards from our home," he says. "Small lizards and snakes would often

worm their way into manholes and become trapped—making them easy captives for curious little boys. To this day, I've wondered what the purpose of those markers was."

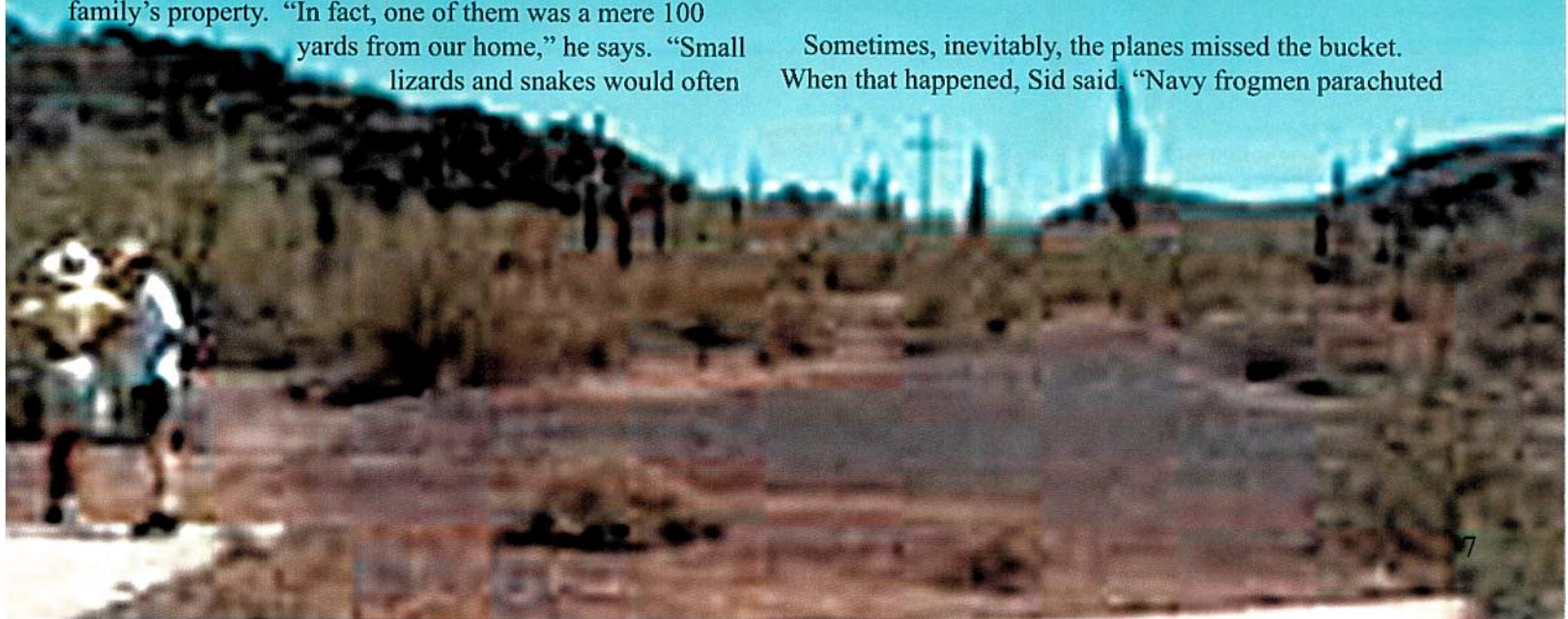
And in one of those cases of serendipity that seem like coincidence but isn't, it turns out that Owen's father Sid worked on the CORONA project for nearly 10 years. He was an engineering supervisor and a staff engineer, first with Itek, the camera designer, then from June 1960 with Lockheed, the prime contractor for CORONA.

Decades later, Sid finally let his daughter in on what he used to do for a living. "He spoke only vaguely about work," she remembers in a flashback to childhood, "and I was never allowed to come to his workplace. I knew he worked on 'payloads,' but that was about it."

The "payloads" comment was part of a much broader cover story released to confuse or counter Communist curiosity. "For several years the program was publicly called the Discoverer program," Sid recently wrote Pez, "and it supposedly carried scientific experiments into orbit. Some small experiments were actually flown, and the resulting data published. There were even plans to orbit and recover a monkey and other small living animals."

He also disclosed previously unknown details about how the photos were retrieved: "To return a Recovery Vehicle (a/k/a a bucket or capsule), the Agena satellite vehicle, which normally orbited tail first, that is, with the engine in front, would be pointed tail first and somewhat down. The bucket would be released and then slowed down with its retro rocket. Without the centrifugal force throwing it upward, the bucket would fall out of orbit toward the ocean—it would de-orbit. Parachutes slowed the fall and permitted recovery aircraft with special trailing trapeze rope loops to snare the parachute lines. The bucket and parachute were then winched into the plane."

Sometimes, inevitably, the planes missed the bucket. When that happened, Sid said, "Navy frogmen parachuted





A view of one of the markers to the left and a close up below. The markers are stamped with their location along with the year of installation.

Writing for the CIA's Center for the Study of Intelligence (CSI) about the tortuous process of declassification, Kevin C. Ruffner credits CSI director Brian Latell with demonstrating "that the release of this material would mark a significant step forward in the Agency's efforts at openness, while still safeguarding CIA's legitimate need to protect sources and methods."

Albert D. Wheelon, who was the CIA's first Director of Science and Technology, and who later became CEO and chairman of Hughes Aircraft, was responsible for the intelligence agency's technical collection and analysis activities, including the first recon birds. He once declared, "The main lesson of CORONA is to be persistent."

The same could be said of two curious Arizonans whose airborne joy ride helped solve a Cold War mystery.

to it and secured it from sinking until a Navy ship arrived. It was designed to float for 24 hours, then automatically sink—rather than be picked up by a Russian ship, which was frequently near."

What started as quixotic curiosity for Pez had become a search-within-a-search. "Maybe my romantic notions aren't so far off base after all," she says.

And now, to echo Paul Harvey, for the rest of the story.

After being a poster project for government secrecy, 23 years after its last mission, the CORONA program let the sunshine in. In February 1995, President Bill Clinton signed Executive Order 12951, releasing the imagery from CORONA, ARGON and LANYARD to the National Archives and the U.S. Geological Survey. All those uber-private pictures were to be declassified and made available to the public.



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