

The Vanishing Fremont

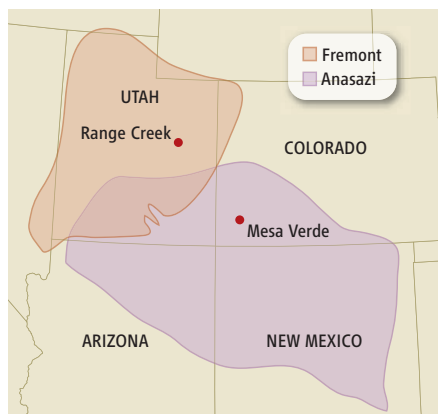
What forced the Fremont Indians into sky-high cliff dwellings 1000 years ago, and why did they disappear a few hundred years later? A rugged Utah canyon yields new clues

WHEN LARRY COATS PULLED HIMSELF up to an overhang near the top of a pinnacle in Range Creek Canyon, more than 200 meters above the valley floor, his left foot landed on a perfect square that had been pecked into the rock face, exactly where a climber would want it. He looked up and a mysterious, hidden world from Utah's prehistoric past revealed itself. An obscure buttress held pictographs only visible from this precarious spot. Climbing even higher, he followed a series of steps carved into the sandstone wall that led to the multipinnacled summit.

From there, Coats, a paleoecologist at the University of Utah in Salt Lake City and a professional climber, rappelled down the rock face to explore lower ledges and overhangs that were accessible only from the summit. He found 1000-year-old granaries—food storage caches made of mud, stone, and wooden poles—built into the cliff wall, as well as pottery remnants, more rock art, the outlines of subterranean pit-house structures, and a metate, a stone used to grind corn. The metate “was perfectly placed, tucked carefully under a

ledge, as though someone was intending to come right back and get to work grinding maize,” recalls Coats, who has surveyed the cliff's pinnacles over the past two summers with archaeologists.

The sky-high lodgings and accouterments that Coats found are part of a much larger constellation of sites currently being documented in this remote canyon nestled behind the towering Book Cliffs, 240 km



Under the same sun. The neighboring Fremont and Anasazi peoples faced severe ancient droughts.

southeast of Salt Lake City. Range Creek's reclusive owner sold it to the state of Utah in 2001, and archaeologists have been amazed by its spectacularly preserved ruins. Newly dated to roughly 1050 C.E., Range Creek was one of the more populous settlements of the Fremont people, enigmatic farmer-foragers who lived mostly in what is present-day Utah and western Colorado.

After years of surveying, researchers have begun to work the giant site in earnest. They made their first round of excavations last summer and are working to build a tree-ring record and gather radiocarbon dates, says archaeologist Duncan Metcalfe, who heads the Range Creek Research Project at the University of Utah, Salt Lake City. The scientists hope that the site's archaeological riches, including an apparent network of caved-in pit-house villages just above the valley floor, will yield insight into what is perhaps the greatest mystery concerning the Fremont: Why did they vanish?

Metcalfe and others believe that the conditions that led to the Fremont's puzzling disappearance in 1300 C.E. are vividly expressed in Range Creek's social

High art. Only professional climbers can get a close view of many of the Fremont pictographs and artifacts left in the cliffs of Range Creek.

disintegration roughly 150 years earlier. “Range Creek is like finding a new library vault full of information,” says Kevin Jones, Utah’s state archaeologist and a member of the Range Creek research team. “Those books are going to be extraordinarily telling and valuable.”

Indeed, Metcalfe and others believe that Range Creek’s secrets may ultimately reveal information beyond the Fremont culture itself. The Fremont’s sudden collapse 700 years ago parallels that of other long-standing Southwestern cultures, including the Anasazi, the Fremont’s cliff-dwelling neighbors in the Four Corners region. Experts consider the Southwest in the 1200s to have been extremely tumultuous but are split over which was the greater destabilizing force: a downturn in the environment that made farming untenable or a fracture in the social order. Whatever the trigger, fear and violence seem to have spread like wildfire throughout the region in the 13th century. At Mesa Verde in Colorado, for example, the Anasazi sought shelter high in the cliffs and left abundant evidence of gruesome violence and cannibalism (*Science*, 8 September 2000, p. 1663).

The social upheaval extends south, reaching into places like present-day Phoenix, where the Hohokam and other prehistoric peoples also massed together in self-defense in the 13th century. “By 1275, everybody in the Southwest is living in a fort,” says archaeologist Steven LeBlanc of Harvard’s Peabody Museum of Archaeology and Ethnology, whose numerous works assert that the Southwest at the time was beset by warfare.

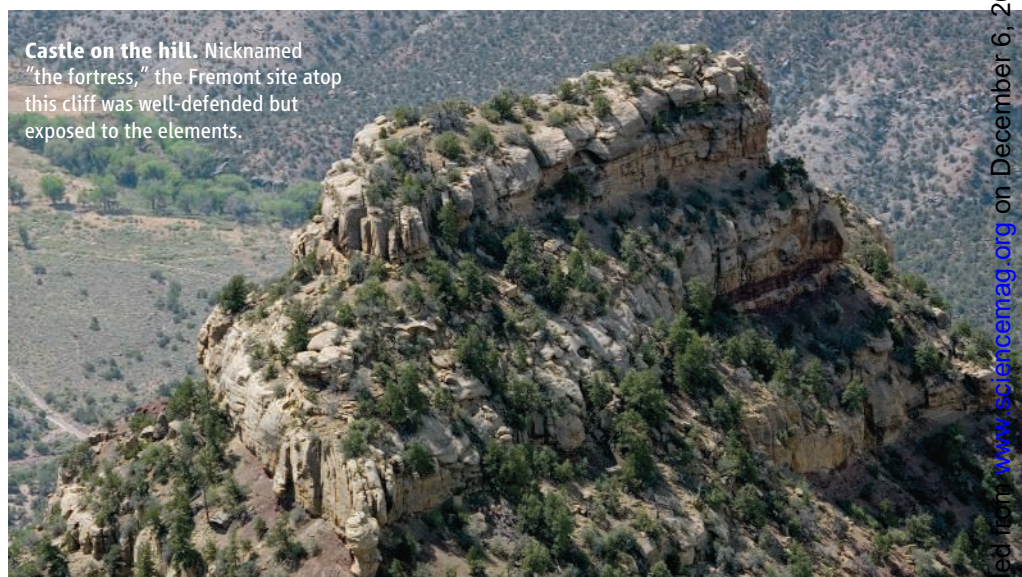
Range Creek, where the Fremont uncharacteristically clustered in fortresslike hideaways and stashed their food in hidden caches, suggests similar strife some 100 or 150 years earlier. Located at the extreme northern fringe of the Southwest, Range Creek was always marginal for farming, notes Metcalfe. Climate changes and subsequent new survival strategies may have occurred there “in advance of what’s happening later throughout the Southwest,” he says.

Farmers, foragers, or both?

In the late 1920s, young archaeologist Noel Morss was exploring central Utah’s rugged canyon country when he found gray pottery, moccasins constructed from deer hocks, and visually arresting trapezoidal figures, which were displayed on clay figurines and picto-

graph and petroglyph panels along the banks of the Fremont river. These material traits had previously been considered an offshoot of an earlier farming culture that flourished south of the Colorado River from 750 C.E. to 1300 C.E. and is known today as the Anasazi or Ancestral Puebloans. But Morss felt the artifacts showed an originality that set them apart from the Anasazi, who wore sandals, lived in elaborate cliff dwellings, and drew Kokopelli and stick figures. He concluded that the “Fremont drainage proved to be the seat of a distinctive culture.” His general characterization of the Fremont has held up remarkably well, and the name stuck.

Ensuing excavations of Fremont sites throughout Utah have uncovered a hodge-



Castle on the hill. Nicknamed “the fortress,” the Fremont site atop this cliff was well-defended but exposed to the elements.

podge of hunting, farming, and foraging habits, however, and today the Fremont are rather fuzzily defined. One camp maintains that they were country cousins of the Anasazi, primarily farmers living in pit houses. Another camp has contended that they developed in situ from a preestablished archaic culture and were predominantly hunter-gatherers who incorporated farming into their repertoire. “We still don’t know who they were, much less what happened to them,” says Fremont expert Jerry Spangler, executive director of the Colorado Plateau Archaeological Alliance, a Utah-based antiquities preservation group. He and some others define the Fremont as “farmer-foragers” who switched between hunting and gathering and farming, depending on circumstances. That versatility makes their collapse even more of a mystery. “They could do it all,” says Spangler. “That’s what makes them so unique among southwestern cultures.”

Range Creek turns out to be an ideal laboratory for discovering more about the Fremont. The rugged landscape, which today remains sparsely inhabited and virtually roadless, has helped keep both the archaeology and the ecosystem largely intact for the past 1000 years. That makes the site a rare prize for southwestern archaeologists, who often work only one step ahead of developers breaking ground for roads and houses. “This is the first time in my life I won’t have a bulldozer at my back,” says Metcalfe.

Range Creek’s protection should continue, because the University of Utah has recently secured a 20-year lease on a 486-hectare parcel containing the greatest concentration of Fremont ruins. Metcalfe runs a summer field

school there as well as a multidisciplinary platoon of scientists, with grants totaling roughly \$300,000 per year from the state of Utah and the National Science Foundation.

But the work is slow: Metcalfe’s team has surveyed just 10% of the 20,234-hectare canyon and expects the total number of sites to number in the thousands. And although researchers have spotted five sets of human remains eroding out naturally, Metcalfe says he has no plans to disturb them, much less do DNA testing. Because Range Creek is largely public land, soon after archaeologists discovered the bodies they notified neighboring Indian tribes as required by law. Tribes typically prefer human remains to stay in their original place of burial. To prevent any conflict, researchers find it easier to avoid the bones altogether.

Instead, Metcalfe and others focus on the granaries and pit houses. Together, these artifacts suggest a society under stress, competing for dwindling food sources, and splintering



Safe storage. At Range Creek, the Fremont cached their food in hard-to-reach granaries such as this one (*inset*).

into self-protective encampments. Of the nearly 400 sites documented in the canyon thus far, 80 are granaries placed far up cliffs and concealed on narrow ledges or under overhangs. The dense concentration of these storage chambers and their hidden nature is “unprecedented” in Fremont history, says Spangler. Range Creek’s granaries “are the most inaccessible I’ve ever seen,” agrees Coats, even harder to reach than those of the Anasazi, which were also generally made of mud and stone and perched on cliff ledges. The inaccessible food caches suggest that the Fremont were defending their food supply. Jones speculates that the Fremont were “scatter hoarding,” spreading their food out in multiple hiding places: “You risk losing some of it, but at least if another person gets into it, they’ve only got one bit.”

Last summer, Coats found additional compelling evidence of defensive settlements. For example, above a pit-house site researchers had dubbed the “deluxe apartment in the sky” because it is nearly 300 meters above the valley floor, Coats found piles of boulders strategically placed at the access points of the ridge. There’s even a log still wedged underneath one of the big rocks. “I assume a lever was in place at one time, where they could release the rocks down onto anyone who was approaching,” says Coats. “It certainly looks like a defensive weapon.”

Another site—atop a butte and “exposed to all the weather,” says Coats—is nicknamed “the fortress” because it contains similar walls of boulders perched at the edges of the ridge. Here Coats observed numerous artifacts on the ground by four well-used pit houses, including metates, pottery fragments, and lithic flakes. All this “indicates quite a lot of activity on top for a significant amount of time,” he says, and suggests long-term, rather than seasonal, occupation. Researchers have discovered numerous other dwellings wedged on the tops of steep ridges, although the Fremont’s cornfields were apparently far below in the floodplain. These

houses “are not next to their farm fields, and they are places where grandma and grandpa would have a hard time getting to, and where your children, with one misstep, would fall and get hurt or die,” says Jones. “Why would you live in a place like that?”

For defense and safety, researchers hypothesize—but defense against whom? Until recently, Jones and other Range Creek researchers thought that the cliff-top dwellings represented the terminal stage of the Fremont, in the 1200s or 1300s, the same time that the Anasazi retreated into cliff dwellings at Mesa Verde. Jones had expected that the lower sites just above the valley floor, where huge circular stone alignments suggest pit-house villages, were earlier, perhaps 900 C.E. to 1100 C.E.

But the new data reveal that the Fremont on the ridge tops and in the villages may have co-existed, perhaps about 1050 C.E. A dozen radiocarbon dates, obtained from corn, arrow shafts, granary beams, pit-house rafters, and other organic material have produced a tantalizing pattern, says Metcalfe. Of the 12 dates, 10 share a 95% confidence interval that falls between 970 C.E. and 1130 C.E., with the average falling at 1050 C.E. To further narrow the range, Metcalfe plans to use tree rings, which offer accurate dating to the year.

Based on the density of pit-house alignments in the valley, Metcalfe estimates that a total of about 1000 Fremont lived in the canyon. But there are no trash middens, as expected if the Fremont had a long-term presence there, he says. “They stayed for a relatively short time and got out fast,” he believes.

The defensive settlements and 1050 C.E. date are commensurate with sites in nearby canyons along the Green River, including Nine Mile, a spectacular rock-art site that also features remote granaries and fortresslike structures atop ridge tops.



“Everything we have in Nine Mile and Range Creek points to groups of people protecting themselves

and their food,” says Spangler. In addition to the shields and human combat depicted in Nine Mile’s rock art panels, researchers in 1992 found a child buried with an arrow point in its chest cavity.

The Fremont also apparently massed together later, during the 1200s, on a scale much larger than Range Creek at a site called Five Finger Ridge in south-central Utah. The giant site is radiocarbon dated to between 1200 C.E. and 1300 C.E., near the end of the Fremont period, and includes remote granaries tucked high in the cliffs and more than 60 structures, including pit houses, packed tightly together on a knoll.

At Range Creek, if the dates for valley dwellings do indeed coincide with those in the ridges, it’s unlikely that the Fremont were protecting themselves from outsiders: The whole region was settled by Fremont, says archaeologist Joel Boomgarden, a member of the research team. “I’d be willing to bet it’s from people within the canyon. They’re probably defending themselves against their neighbors.”

The dry years

But why? Was it social or climatic factors, or some combination of the two, that splintered Fremont society? New climatic records offer clues. In several studies published this year, paleoclimatologist Larry Benson of the U.S. Geological Survey (USGS) in Boulder, Colorado, plotted out a series of major droughts that pummeled the Midwest and Western regions from the early 11th century to the end of the 13th century. He borrowed a drought index—which uses prehistoric tree-ring data on precipitation and temperature to estimate soil moisture—from Edward Cook of Columbia University and his colleagues. The index charts conditions year by year, which Benson and colleagues then compared

to events in some of the agrarian cultures that melted away during this span, such as the Anasazi, Fremont, and Cahokia; the latter farmed the Mississippi River floodplains and valleys.

If the Range Creek occupation was in fact at its height about 1050 C.E., it coincides with one of a series of decadal-long droughts in the region, says Benson. “There is a 20-year drought in the Four Corners [area] centered at 1050, and it follows a pretty dry period that lasted much longer,” he says.

The match between climate and cultural upheaval becomes even clearer in the next 2 centuries. Benson notes that scientists now consider the mid-12th century megadrought (1135–1180 C.E.) to be the most severe in the past 2000 years. At this time, the Anasazi abandoned their main hub in Chaco Canyon in present-day New Mexico and started bunching together in Mesa Verde’s cliffs in Colorado. There, “average precipitation during this drought was reduced by 11%, with some years seeing a reduction in the mean of approximately 50%,” says Benson.

A century later, at about the time the next persistent drought (1276–1299 C.E.) is over, both the Fremont and Anasazi are gone from their ancestral homelands. “In some sense, the 13th century drought may have simply ‘finished off’ some cultures that were already in decline,” Benson and his co-authors wrote earlier this year in *Quaternary Science Reviews*.

Those droughts went beyond the Southwest, impacting much of the contiguous United States, he says. A close reading of the drought index shows that the mid-12th century drought “was impacting the Midwest, from Illinois, all the way to the coast of California,” says Benson. “The climate is causing crops to fail in the Four Corners where the Anasazi were based, and in Utah, where the Fremont lived; and it is probably also causing crops to fail in the Mississippi valley.”

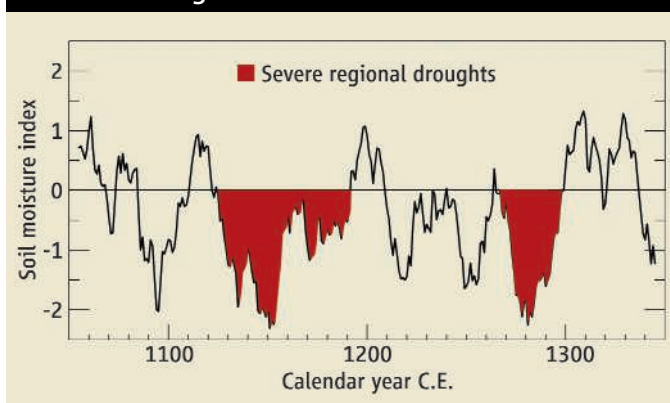
The impact was all the harder because of the previous and intervening wet years, researchers suspect. There’s evidence that after each drought the Fremont rebounded as climate improved. “Each time they did that, there seems to be a population boom,” says Steven Simms, a Fremont scholar and archaeologist at Utah State University in Logan. But those extra mouths to feed demanded more crops, leaving the culture even more vulnerable to the next dry spell.

Other climate change forces may also have been at work, including a cold period in the 900s and in the late 1100s suggested by a new analysis of pollen data, says archaeologist Timothy Kohler of Washington State University in Pullman. For the Fremont, eking out a living in an environment already marginal for agriculture, an earlier frost and shorter growing season would have been yet another major hurdle.

To some, all this adds up to a persuasive case for climate change. “I think the evidence for drought as a forcing mechanism is starting to get pretty obvious,” says archaeologist Michael Berry of the U.S. Bureau of Reclamation in Salt Lake City, one of Benson’s co-authors. “It’s not just a factor. It’s a forcing factor.”

If a deteriorating climate triggered food shortages, some researchers speculate that social disorder resulted. “It starts to tear at the social fabric,” says Simms.

Ancient Droughts in the Four Corners Area



“That’s why late in the record, like in Range Creek, you see these granaries perched way up in the cliffs. It’s very much like when you get an oil embargo and you get fistfights at gas stations.”

Other experts agree and say that this kind of climate-triggered chaos may have reverberated on a larger scale across the Southwest in the 1200s. “If the crops aren’t working, you might start blaming your rain priests or your ideology,” says Jeffery Clark, an archaeologist at the Center for Desert Archaeology in Tucson, Arizona.

But the Fremont were such generalists, switching from farming to foraging so easily, that other researchers argue that the megadroughts alone wouldn’t have killed them off. “It had to be a combination of circumstances that caused this culture to end after 1000 years of success,” says Simms. “It can’t just be drought. They weathered those before.”

That’s why many southwestern archaeologists favor a mix of environmental and social causes. “Environment is always a factor,” says archaeologist Carla Van West of the SRI Foundation, a New Mexico-based historic preservation organization. “The question is whether it is a causal, proximate, or an ultimate cause.”

Archaeologist Christy Turner of Arizona State University in Tempe has hypothesized that brutal social and political control, a kind of religious terror, was exported into the American Southwest from Mexico about 900 C.E., when evidence of cannibalism starts to show up in the Four Corners region (*Science*, 1 August 1997, p. 635). Turner speculates that the practice spread like a virus and eventually caused populations to splinter and coalesce in defense, until they eventually collapsed.

Yet other scientists find the climatic evidence hard to argue against. Says Julio Betancourt, a USGS paleoclimatologist based in Tucson, Arizona: “If you have three or four corn crops in a row failing, they’re going to be a dead people; they’re going to starve to death. You can bring culture all you want into the picture; it’s not going to matter.”

That the Cahokia’s great mound-building culture in the Midwest collapsed at the same time as the Anasazi and Fremont strikes some as beyond coincidence. Says Boomgarden: “It almost seems like the link has to be climate, because populations that far apart shouldn’t have much to do with each other.”

As research on these cultures continues, Range Creek, because of its archaeological and ecological purity, is expected to provide a crucial piece of the puzzle. Next summer, Coats wants to scale the ridgeline across the canyon to search for additional cliff-top dwellings. “I’m convinced there will be more sites up there,” he says. By then, Metcalfe, who plans to expand excavations to include several sky-high sites, hopes to have the tree-ring history of Range Creek in hand, revealing precisely when the drought struck the canyon.

Still, exactly why the Fremont and other cultures sought refuge in the cliffs may elude researchers for some time. Says Spangler: “Is it warfare for warfare’s sake? Is it warfare because of environmental stress because you can’t produce enough food? There are multiple lines of evidence for each argument.”

—KEITH KLOOR

Keith Kloor is a senior editor at *Audubon* magazine.