# Snake River Anthology

## *A landscape springs from the depths of the Earth*

By Glenn Oakley

From the top of Old Juniper Kipuka a solidified sea rages in all directions. Huge swells of titanium blue rise up against the island. Waves of stone stand motionless.

This is the source, in essence, of the Snake River Plain. During the last 15 million years, from Weiser to Ashton, fractures have opened in the earth and lava has poured out. Rope-like coils of *pahoehoe* lava, shining iridescent blue. Black rubble fields of *aa* lava. Red cinder cones. These features are obvious at Craters of the Moon and along the Great Rift, which encompasses this national monument. Two thousand years ago, hundreds of vents along the Great Rift erupted with molten magma, covering all but the highest points of land — now known as kipukas, islands in the sea of lava. Elsewhere, the volcanic origin of the Snake River Plain has been obscured. Windblown soil has buried the lava, providing the farms for Idaho's famous potatoes. Communication antennas sprout from the age-softened tops of cinder cones and volcanoes. Highways glide effortlessly over craters and lava pressure ridges.

But from the densest concentration of nesting raptors at the Birds of Prey Natural Area to the densest concentration of nuclear reactors at the Idaho National Engineering Laboratory, the natural and human history of the Snake River Plain originates in the volcanic vents.

The Snake River Plain is a crescent-shaped volcanic plateau extending 400 miles across southern Idaho, from the Tetons on the east to the Oregon border on the west. Bounded on the north by mountains of the Idaho batholith and basin and range, the plain tilts gently southward, terminating just south of the Snake River.

The Snake River rides atop the lavas in its eastern headwaters. As the river flows west it slices 500-foot gorges through the successive layers of basalt, plunging over waterfalls.

For more than 200 miles across the northern Snake River Plain not a single river or stream makes its way to the Snake River. The porous lavas soak up rivers borne from the snowmelt of the mountains to the north: the Lost River Range, the Lemhis, the Beaverheads, the Pioneers. The Big Lost River winds through a high mountain valley and then sinks out of sight when it leaves the sedimentary rock of the valley and enters the Snake River Plain. Rivers and streams like the Big Lost River percolate down through the gas bubbles, fissures and fractures in the basalt to feed what is one of the largest and most heavily used aquifers in the country.

Geologists estimate the Snake River Aquifer holds enough water to flood the state of Idaho under a 4-foot sea. This water cruises along in a southwesterly flow at 5-25 feet per day, following the rubbly spaces between flow layers and coursing through lava tubes. A portion of the aquifer bursts free of its subterranean captivity in what was once a spectacular series of waterfalls cascading from the lava cliffs above the Snake River in the Hagerman Valley. Most of these springs are now siphoned into electricity-producing turbines or funneled into hundreds of concrete raceways where 75 percent of the country's commercial trout are reared.

Geologists have an incomplete understanding of what created the Snake River Plain, admits BSU geology professor Spencer Wood. The prevailing theory links the plain with a "hot spot," a source of intense heat deep within the Earth's surface. As the North American continent drifted westward, says Wood, what

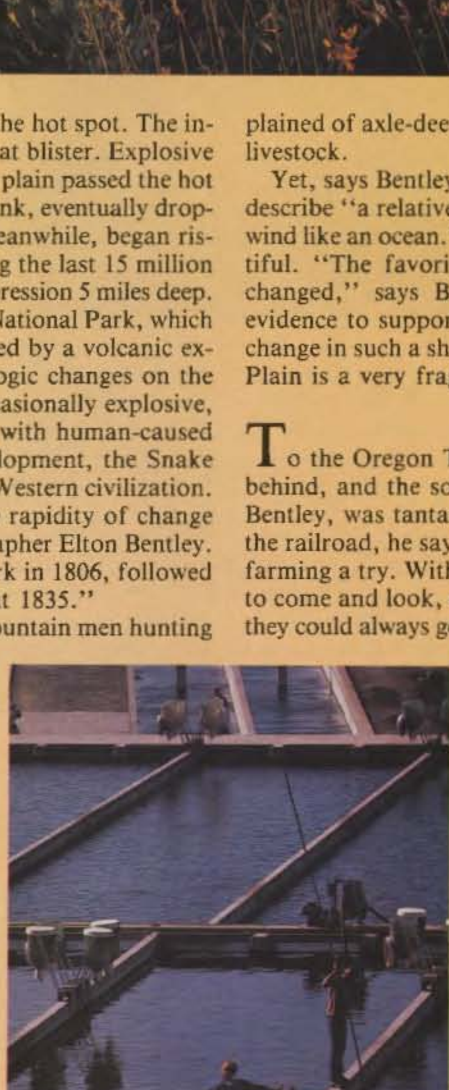
is now southern Idaho began passing over the hot spot. The intense heat raised the Earth's crust like a great blister. Explosive volcanoes burst to the surface. Then, as the plain passed the hot spot, the crust cooled, the blister began to sink, eventually dropping some 20,000 feet. Basaltic magma, meanwhile, began rising to the surface of this depression. During the last 15 million years successive lava flows have filled the depression 5 miles deep. The hot spot now lies beneath Yellowstone National Park, which is itself a massive caldera — a crater formed by a volcanic explosion dwarfing Mount St. Helens. Geologic changes on the Snake River Plain, while dramatic and occasionally explosive, took place over millions of years. Not so with human-caused changes. Despite its seeming lack of development, the Snake River Plain has been drastically altered by Western civilization. "I think the thing that's astounding is the rapidity of change on the Snake River Plain," says BSU geographer Elton Bentley. "We in essence started with Lewis and Clark in 1806, followed by the mountain man era of 1811 to about 1835."

Although there were perhaps only 200 mountain men hunting and trapping on the Snake River Plain, says Bentley, "they were instrumental in eliminating the great herds of bison that were here." The last Snake River Plain bison was killed in 1840 near Pocatello, says Bentley. Similarly, bighorn sheep, elk and bear were driven off the plains into the mountains.

The first Oregon-bound wagon trains began crossing the Snake River Plain in 1836. Says Bentley, "By 1843 the people on the Oregon Trail were complaining that the Snake River Plain marked the most difficult and critical part of the trip. From Independence, Mo., to Oregon, the Snake River Plain was the part they most dreaded." In the seven short years of Oregon Trail traffic, says Bentley, "the grasses were gone, the wood supply was gone and the water holes were dried up." Diarists from the Oregon Trail complained of axle-deep dust, no game to hunt and no grass for the livestock.

Yet, says Bentley, accounts of the plain from the early 1800s describe "a relatively lush plain of bunch grasses waving in the wind like an ocean." Trees filled the draws and wildlife was plentiful. "The favorite interpretation of all this is the climate changed," says Bentley. But, he argues, "There isn't any evidence to support that." Rather, he suggests, this dramatic change in such a short amount of time "tells us the Snake River Plain is a very fragile physical environment."

To the Oregon Trail settlers, the plain was a place to leave behind, and the sooner the better. To stay on the plain, says Bentley, was tantamount to suicide. Only with the coming of the railroad, he says, were people willing to homestead, to give farming a try. With the train, says Bentley, "You could afford to come and look, and if you didn't like it, leave. People knew they could always get back on that train and go back or go west."



But the settling of the plain really accelerated with the federal water projects that allowed farmers to irrigate the dry desert lands. American Falls Dam, the Boise Water Project with its New York Canal, the Milner Dam — all these projects made possible the dream of turning the desert green.

Irrigation was initially tied to the Snake River and the canals that siphoned off its waters. But in the 1950s the first irrigation well was drilled into the vast Snake River

**Opposite left: Wild strawberry colonizes tiny fractures in pahoehoe lava on the Great Rift lava flow. Above: Old Juniper Kipuka, covered with yellow balsamroot flowers, is an ancient caldera surrounded by younger lava flows. Left: Trout farms in the Hagerman Valley, tapping the Thousand Springs, supply 75 percent of the nation's commercial rainbow trout.** Glenn Oakley photos

**Above: Irrigated farming has dominated the Snake River Plain, but the interstate may be the new force determining the life and death of its communities. Right: When water is abundant, Shoshone Falls is one of the world's spectacles. But low water and irrigation withdrawal in recent years have left the cataract dry.**
**Glenn Oakley photos**

Aquifer, and a second irrigation boom was on. On the wings of cheap, subsidized electricity, the Snake River Plain became one of the richest agricultural regions in the nation.

What was once considered a wasteland fit only for jackrabbits, rattlesnakes and sagebrush blossomed with fields of potatoes, wheat, barley, sugar beets and alfalfa.

But there has been a price to pay for this development, both cultural and environmental. "Things happened so fast that people didn't even have time to name the roads," says Bentley. "There was no history. The old timers were the ones who arrived the year before." Even today, says Bentley, "There doesn't seem to be a sense of permanence."

Indeed, the towns and farms that sprung up so quickly on this volcanic landscape are already undergoing major changes. Railroad farm towns are dying. The rising cost of electricity is placing a sometimes unbearable strain on farmers who must pump their irrigation water up the walls of the river canyon or from deep within the aquifer.

And demand for water now exceeds the amount available on the Snake River Plain. Future irrigation water withdrawal from the aquifer and the river has been limited in a compromise between the State of Idaho and Idaho Power Co., which has a significant water right on the river. Irrigation has historically superseded all other uses of the Snake River. Fish, wildlife, electricity production and recreation have all been subordinated to irrigated farming. Except for seepage through cracks in the Milner Dam west of Burley, the entire Snake River is diverted into the Northside and Southside Canals. The Snake River is shut off, its bed of carved black basalt dry as a bone. Shoshone Falls, a mammoth cataract higher than Niagara Falls, has for the past three years had but a trickle of water pouring over its sides. And the Snake River Aquifer has begun dropping under irrigation withdrawals.

But all problems with the aquifer are not associated with removal of water. The *injection* of contaminated water has produced some of the most emotional and troublesome environmental problems in the state. The most widely known problem has been the injection of radioactive wastes into the aquifer at the Idaho National Engineering Laboratory. From 1953 to February 1984 the Chemical Processing Plant at INEL injected an average of 1 million gallons per day of radioactively contaminated water down a 600-foot deep well.

INEL officials said dilution in the aquifer, radioactive decay and the bonding of some radioactive elements to the basalt made the injection of no harm to the aquifer outside the boundaries of the INEL site. Nevertheless, under increasing pressure from the state and environmental groups, INEL stopped using the well in 1986. Now, radioactive wastewater is dumped into ponds and allowed to percolate into the aquifer. By 1991, INEL spokesman John Walsh says, the ponds should be lined to prevent percolation. Solid radioactive wastes buried with no containment provisions provide another source of concern for contamination of the aquifer. Plutonium has been found 210 feet deep in the basalt.

Farmers tapping the aquifer and river have expressed concern over the safety of the water. But it may well be that the most serious threat to the aquifer comes from the farmers themselves. Across the plain excess irrigation runoff — contaminated with herbicides, pesticides and other agricultural chemicals — leaches or is injected right back into the aquifer. Buried gasoline tanks at service stations, farms and businesses have leaked, creating literally explosive situations when the gas-contaminated groundwater surfaces in wells, schools, hospitals and homes, says Cheryl Grantham, groundwater supervisor for the State Water Quality Bureau.

Farmers have additional problems on the plain. Increasing electricity costs will probably continue to drive them out of business, suggest Bentley. "There'll always be agriculture on the Snake River Plain, but I think what you'll see in the next 30 to 40 years is a refinement," he says. More sophisticated irrigation systems and water conserving cement-lined ditches will be increased. Marginal areas may be abandoned.

Bentley says human occupation on the plain has occurred in

waves. First the wave of trappers, followed by the wave of wagon trainers. Then the wave of farmers.

"I guess the new wave is the interstate," says Bentley. "Truckstops and motels and service stations and shopping centers. It's almost like the interstate is sucking the vitality from the towns. I don't think we're building a landscape that will survive."

Of course the Snake River Plain has its own agenda. Lava will flow again, says Wood. The next eruption may occur in a thousand years, or the year after next. We will have warning. Harmonic tremors, vibrations ringing through the rock of the plain, will let us know the next wave is coming. The sea of stone will rage again. □

## Snake River book planned

Several Boise State facnlty members are combining their expertise for a comprehensive book on the Snake River Plain that will be pnblished in conjunction with the Idaho Centennial.

*Volcanic Lands: The Snake River Plain and Its People* is being edited by history professor Todd Shallat and Robert Sims, dean of the School of Social Sciences and Public Affairs.

"It will be an interdisciplinary publication that encompasses 17 million years of the Snake River Plain's geology, geography, archaeology, history and politics," says Shallat. "It will be well illustrated and targeted for a broad public audience." Contributors from BSU are archaeologist Mark Plew, geologist Elton Bentley and political scientist John Freemuth.

Chuck Scheer illustration