UC SANTA BARBARA

THE Current

February 3, 1999
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Out of the Crater Tells Stories of Volcanoes

In an engaging new book, Out of the Crater, Chronicles of a Volcanologist, published by Princeton University Press, volcanologist Richard V. Fisher, of the University of California, Santa Barbara, recounts high points and memorable moments in his world travels studying the secrets of volcanoes.

The book, part memoir and part scientific description, weaves together highlights of 40 years of research, people and places. It captures the pure joy of discovery and the riveting details of each expedition as the author describes the detective work of combing through scientific clues in the far-flung volcanoes of Oregon, Hawaii, New Mexico, Italy, Argentina, Mexico, Martinique, Germany and China.

Fisher explains his pioneering studies of pyroclastic flows and surges, the hurricanes of gases, molten lava and volcanic debris that cause most of the death and destruction when volcanoes explode. He gives an account of solving a historic scientific problem at Mount Pelee, Martinique, where 29,000 people were killed in a pyroclastic flow in 1902.

He talks about his motivation to do scientific work that will help save lives, and of encountering residents of volcanic areas with the typically human urge to stay put as they ignore government warnings to move away from an impending eruption.

For example, he describes meeting a fisherman in Pozzuoli, Italy against the following backdrop, "Pozzuoli was in a state of crisis when I visited there in 1984. Between June 1982 and December 1985, the magma body beneath had raised the center of Pozzuoli six feet. There were cracks in the buildings everywhere I went..." The town is located in the center of the caldera where repeated earthquakes and ground-swelling episodes have

occurred since the time of the Roman Empire and probably before.

A local fisherman explained to Fisher, "All my life I have lived in Pozzuoli, and now the government says I must sell my apartment...The authorities say there might be an eruption but it is nonsense, the government wants me to believe that so they can buy property at half price." He concluded by saying that in spite of the earthquakes and cracking and falling of his building, "I am a fisherman and I need to be by my sea and live in my place of beauty. I will not move from Pozzuoli!"

The exploration and enjoyment of remote and beautiful places is another key theme of the book, and Fisher clearly relishes every moment. Of Mount Ranier, Washington he says, "Massive and beautiful. At its foot I have rested along the trails in the silence of the forest and watched the eagles soar. I have watched cliffs of ice at glacier's ends crackling and then crashing to the valley floor and have crossed creeks on stones rounded by rushing debris floods. I have watched its white slopes painted red by the rising sun and have sat by my campfire in the night as the moon's ghostly light reflected from its snowy summit."

His passion for his field caught fire early. He says, "At the age of 20, with a great deal of luck, I stumbled upon the profession of geology and for nearly fifty years I have courted the earth, roaming its deserts and forests, its mountains and volcanoes. I was often alone with the elements, extracting stories from the rocks, making new discoveries and building on those of my contemporaries and predecessors. It has been the most enjoyable of occupations, solving unsolved mysteries of the earth and thinking of new ideas - the lifeblood of science."

Fisher draws an important distinction, pivotal in his field, between geologic time and real time, and tells how one of his greatest lessons was learning to appreciate geologic time, the key to understanding geologic processes.

"Given the immensity of time, great changes occur within and upon the earth by processes so slow that they are unnoticed in the lifetime of a person," says Fisher.

"Human beings can barely, if at all, detect normal - changes of the earth -- for example momentous 'upheavals' of the Himalyan Mountains -- as they occur. A rate of uplift on the order of a tenth of an inch per year can raise mountains to over eight thousand feet in one million years -- slow to us, but very fast on the possibly infinite time scale of the universe."

Volcanoes, by contrast, happen in real time. "You can see them create new rocks on the earth's surface and, in areas such as Hawaii, new land in the oceans," says Fisher. "Understanding volcanoes ... requires that, for each volcano, volcanologists determine the chemistry, unravel the history, and discover the eruptive cycles and the types of eruptions that have occurred."

Fisher, professor emeritus of geological sciences, has taught and conducted research since 1955 at UCSB. He was awarded the Thorarinsson Medal, the highest honor of the International Society of Volcanologists in 1997. He wrote Volcanoes: Crucibles of Change, also published by Princeton University Press, with co-authors Grant Heiken and Jeffrey B. Huled. Pyroclastic Rocks, with H.U. Schmincke is another of his books, he also edited Sedimentation in Volcanic Settings with G.A Smith.

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