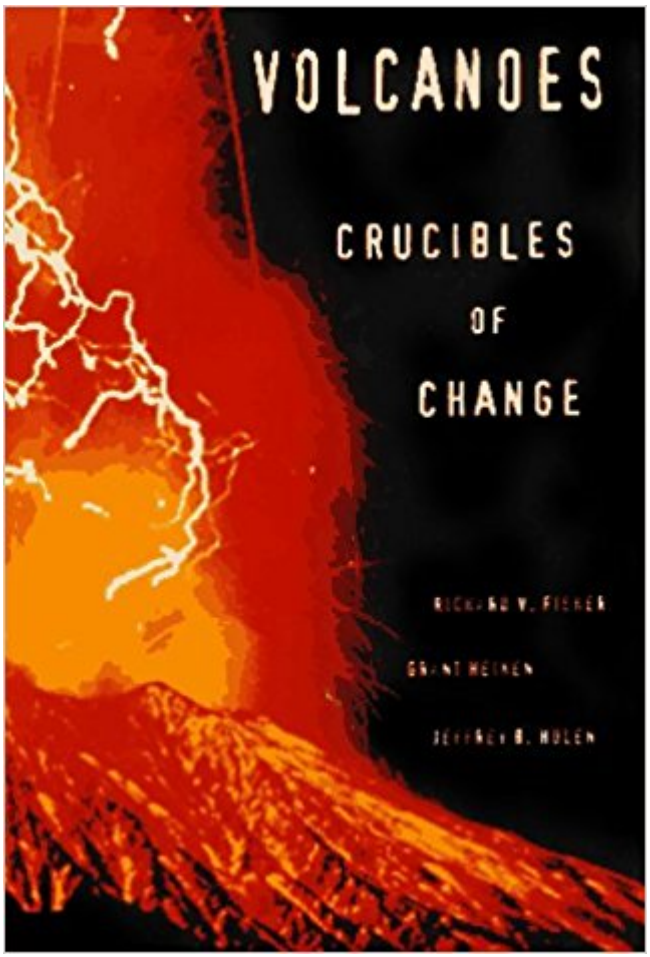
Volcanoes: Crucibles Of Change



Synopsis

Whenever a volcano threatens to erupt, scientists and adventurers from around the world flock to the site in response to the irresistible allure of one of nature's most dangerous and unpredictable phenomena. In a unique book probing the science and mystery of these fiery features, the authors chronicle not only their geologic behavior but also their profound effect on human life. From Mount Vesuvius to Mount St. Helens, the book covers the surprisingly large variety of volcanoes, the subtle to conspicuous signs preceding their eruptions, and their far-reaching atmospheric consequences. Here scientific facts take on a very human dimension, as the authors draw upon actual encounters with volcanoes, often through firsthand accounts of those who have witnessed eruptions and miraculously survived the aftermath. The book begins with a description of the lethal May 1980 eruption of Mount St. Helens--complete with an explanation of how safety officials and scientists tried to predict events, and how unsuspecting campers and loggers miles away struggled against terrifying blasts of ash, stone, and heat. The story moves quickly to the ways volcanoes have enhanced our lives, creating mineral-rich land, clean thermal energy, and haunting landscapes that in turn benefit agriculture, recreation, mining, and commerce. Religion and psychology embroider the account, as the authors explore the impact of volcanoes on the human psyche through tales of the capricious volcano gods and attempts to appease them, ranging from simple homage to horrific ritual sacrifice. Volcanoes concludes by assisting readers in experiencing these geological phenomena for themselves. An unprecedented "tourist guide to volcanoes" outlines over forty sites throughout the world. Not only will travelers find information on where to go and how to get there, they will also learn what precautions to take at each volcano. Tourists, amateur naturalists, and armchair travelers alike will find their scientific curiosity whetted by this informative and entertaining book.

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Customer Reviews

The authors, professional volcanologists all, offer a rigorous geological account of the formation and composition of the many types of volcanoes, among them calderas, domes, and maars. They examine the chemistry of volcanic gases; consider the role volcanoes play in the formation of precious stones and minerals; and analyze advances in accurate seismological prediction and emergency disaster relief. They provide, in short, an admirably complete primer for volcano buffs, to which they add an unusual appendix describing the world’s great volcanoes from a traveler’s point of view, with directions for scaling peaks like Canada’s Mount Garibaldi, Indonesia’s Galanggung, and Italy’s Stromboli.

"A vivid, insightful, heavily illustrated book. . . . Most important, Volcanoes is fun. The authors take us on a roller-coaster ride through centuries of volcanic thrills, keeping our attention riveted on the deadly fireworks, while giving us just enough science to deepen our awe."--William J. Broad, The New York Times Book Review "A short course in volcanology offered by a team of scientists who bring both scholarship and something like glee to their work. . . . Abundantly illustrated, always accessible and sometimes downright chatty, Volcanoes is a work of science that has not lost its sense of wonder."--Jonathan Kirsch, Los Angeles Times "Volcanoes: Crucibles of Change is written by three respected vulcanologists who, having witnessed several volcanic tragedies, hope to inform and educate people about the wonders, the thrills, and the dangers of volcanoes. . . .[It is an] informative and entertaining book."--Hazel Rymer, The Times Higher Education Supplement "[An] entertaining and informative book that puts volcanoes firmly in their social and cultural place, as well as summarizing the scientific advances that have helped us to understand why and when they erupt. . . . It’s a good read, too, written with enthusiasm and expert knowledge, as well as deadpan humour."--Sue Bowler, New Scientist "Volcanoes is a compendium of facts and observations, compellingly and concisely explained."--Richard Fortey, London Review of Books

Neither too little or too much, Volcanoes: Crucibles of Change is the best volume I have ever read on Volcanology. Written for the intelligent layperson, the book never talks down to its reader or loses them in mult-semicolon sentances of unintelligble jargon as so many other books by scientists do. If

you want the latest theories on volcanoes, this is th book for you. I was especially surprised by how many dormant/active volcanoes there are in the lower 48. And as one who has flown from the U.S. to Japan, the chapter on planes and volcanoes was both fascinating and scary.

Volcanoes: Crucibles of Change by Richard V. Fisher, Grant Heiken, and Jeffrey B. Hulen is a fascinating and very well-written look at volcanoes, including their formation, structure, dangers, benefits, and how they have affected human history. The book is richly illustrated with photographs, maps, and fascinating diagrams explaining volcanic processes. Part one consisted of four chapters that looked at the geology of volcanoes. Important to understanding volcanoes is knowing where they form; they can appear over subduction zones (where one tectonic plate is pushed under another; the subduction of the Pacific plate under the American plate produces the volcanoes of the Cascade Mountains), extensional boundaries (where plates move apart, mainly between plates on the seafloor), and over hot spots (thermal plumes rising through the mantle than can be well away from either subduction zones or extensional boundaries). Also important to understanding volcanoes is knowledge of the composition of the magma that forms them. Magma containing less than 55% silica is called basaltic and is very fluid and has low-viscosity. It can easily form large lava flows and gas can rapidly escape from it, forming huge fountains (the authors compared it to the ease with which steam escapes from rapidly boiling water). Rhyolite lava on the other hand is comprised of over 70% silica, is very viscous, and gas does not readily escape from it unless the pressure is big enough (think of how hot oatmeal spatters explosively). Basalt lava generally forms beneath or within oceanic plates, rhyolite lava beneath or within a continental plate, and a third type, andesite lava (between 55% and 70% silica), where the two types of plate overlap. Volcanoes may take a variety of forms. Composite volcanoes or stratovolcanoes, such as Mount St. Helens and Mount Fuji, are graceful, solitary, often quite high and covered in snow or ice and are comprised of innumerable layers of rubble and debris from previous eruptions. Lava domes are protrusions of lava on the outside slope of many composite volcanoes or within their craters, built by the slow extrusion of viscous silica-rich magma. Calderas (from Spanish for "cauldron") are very large craters formed when the ground surface collapsed as the result of the extrusion of very large amounts of ash, pumice, and rock and can be quite large. Cinder cones or scoria cones are relatively small volcanoes, high mounds with small craters at the top, comprised of basaltic fragments called cinders or scoria, rocks that contain an abundance of bubble-like chambers. They often occur in clusters and on the slopes of other types of volcanoes. Maars are small volcanoes with wide craters that formed from the sudden explosion that occurred when rising magma came into contact with

groundwater or surface water. Shield volcanoes are broad and have low slopes and are constructed of solidified basaltic lava that was originally in a highly fluid state. Littoral cones are formed when lava flows into water, explodes, and forms a pile of debris into a volcano-like shape; not actually volcanoes, they have no underground source. Eruption types can vary as well. Gas eruptions can be quite silent but lethal, such as the Lake Nyos eruption of deadly carbon dioxide on August 21, 1986 in Cameroon, which killed 1,700 people. Hawaiian eruptions include gusher-like lava flows and lava rivers and produce congealed globs of lava that fly through the air (called lapilli if 2 to 64 millimeters, bombs if larger). Strombolian eruptions produce high-arching, incandescent "rooster-tails" and ejecta that can form cinder cones. Plinian eruptions produce ash columns as high as 50 kilometers into the sky, which thanks to high winds can spread ash hundreds or thousands of square kilometers (the name derives from Pliny the Elder, the Roman nobleman who died in the A.D. 79 eruption of Vesuvius). Volcanoes as noted form underwater and in fact most may be located deep in the sea; one estimate put the number at one million volcanoes with 75,000 rising to over 1 kilometer from the seafloor. Explosive eruptions rarely occur, as 1 kilometer or more below the surface of the sea water pressure is generally greater than any explosive pressure. Some volcanic systems produce black smokers, hydrothermal systems that release black, turbulent clouds of suspended metal-sulfide materials, often creating oases of life in the deep sea. Part two looked at the many hazards of volcanoes. Pyroclastic flows (or volcanic hurricanes) are searing, kiln-hot winds that move faster than ordinary hurricanes and can kill people and animals due to high heat, ash particles that can clog throats and lungs, and by hurtling tons of cobble and boulder sized particles. A pyroclastic surge is a diffuse, gas-rich pyroclastic flow that can move farther and over ridges and water. Debris avalanches can also be a danger, especially if they enter water and produce tsunamis. Volcanic flows or lahars (from an Indonesian word) are masses of mud, sand, gravel, and boulders mixed with water and having the consistency of freshly made cement. Lahars often dam rives and can produce derivative floods for years to come. Also posing a danger are lava flows and ash clouds (the latter can bring down jet aircraft). Part three looked at the many benefits of volcanoes. In addition to producing every atmospheric gas aside from oxygen, volcanoes have given us therapeutic hot springs, clean and safe geothermal energy, igneous rock that can be cut into blocks and used as building stones, fine-grained ash that can be used as a polishing compound (like in toothpaste), concrete (the Romans mined ash they called pozzuolana and made concrete from it to produce their roads, viaducts, and monumental buildings), pumice (long used as an exfoliant scrub and as an abrasive cleaner), obsidian (once highly valued for arrowheads and knives), bentonite (a clay made from volcanic ash, used in everything from the drilling industry to

ceramics to adhesives to kitty litter), gemstones (diamonds were brought from deep within the Earth’s surface by volcanoes), rich agricultural soil, and the preservation of fascinating fossils and artifacts (such as at Pompeii).

I recommend this book most highly. It is well-organized, easily read by anyone with a high school education and a limited scientific background, and all-encompassing on the subject of volcanoes. The latest developments in volcanic petrology, pyroclastic flow study, caldera formation, supervolcanic eruptions and their horrific consequences, and the like are superbly covered. Additionally, the book contains excellent narratives of nearly all significant late 20th Century eruptions, such as Pinatubo, El Chichon, St. Helens, and Paricutin. The research is copious, and the results highly accurate.The book has been well-proofed, with the pleasurable consequence that distortive prose, inaccurate figures, and like blips are virtually non-existent. A fellow reviewer has stated that plate tectonics is not well-covered, but this writer’s view is that the scope of the book lies beyond such basics. Anyone unfamiliar with basic volcanological concepts should first read "Teach Yourself Volcanoes", and then move into this book.Again, I enjoyed this book to the hilt, and would prize it above most other books on the subject. I strongly believe it is the best non-technical book on the subject.

I found that this book has some positives and negatives: Positives: 1. the authors have compiled a wealth of information about volcanoes all over the world: Mt. St. Helens catastrophe, planes flying over eruption clouds, eruption accounts from Krakatua, etc, etc. 2. For a geologist like me, when we study about volcanoes, we tend to forget the human factor, not only hazards, but also how it affects agriculture, tourism, etc. Which I think this book pinpoints very well. Negatives: 1. The book doesn’t flow: lots of information, but in my opinion disorganized. Except for the chapter about Mt. St. Helens, I didn’t understand the point that the authors were trying to make (or probably there was no point, and it was just a plain description). 2. Any time you touch a scientific subject, you are immersed in having to use scientific terms. Since this book is trying to reach a general audience (I think), it will benefit a lot by having a glossary. 3. Some chapters are really weak, like the one that talks about plate tectonics. Plate tectonics is the driving force of volcanoes (mostly) and should have more emphasis on the book, and be explained in more simple terms. 4. The decimal metric system is used throughout the book. This is good when you are writing a paper to publish on a specialized journal, but not for a book aimed at general audiences. The equivalence in the English system should probably go in parentheses.

Volcanoes For Kids - Learn Fun Facts About Volcanoes Erupting, Volcanoes Around The World & Much More! (Volcanoes and Earthquakes) Volcanoes: Crucibles of Change Crucibles: The Story of Chemistry from Ancient Alchemy to Nuclear Fission Volcanoes - Why Do They Happen?: Volcanoes for Kids (Children's Earthquake & Volcano Books) Change Your Gambling, Change Your Life: Strategies for Managing Your Gambling and Improving Your Finances, Relationships, and Health Change Your Gambling, Change Your Life: Strategies for Managing Your Gambling and Improving Your Finances, Relationships, and Health (Harvard Health Publications) The Lose Your Belly Diet: Change Your Gut, Change Your Life IBS: Free at Last! Change Your Carbs, Change Your Life with the FODMAP Elimination Diet, 2nd Edition Mid-Life Career Rescue Series Box Set (Books 1-3):The Call For Change, What Makes You Happy, Employ Yourself: How to change careers, confidently leave ... you hate, and start living a life you love, When Good Men Behave Badly: Change Your Behavior, Change Your Relationship Change Your Brain, Change Your Life (Revised and Expanded): The Breakthrough Program for Conquering Anxiety, Depression, Obsessiveness, Lack of Focus, Anger, and Memory Problems Change Your Thoughts - Change Your Life, 8-CD set: Living the Wisdom of the Tao Thriving Through Change: A Leader's Practical Guide to Change Mastery How Successful People Think: Change Your Thinking, Change Your Life The Heart of Change: Real-Life Stories of How People Change Their Organizations Ordinary People Change the World Gift Set (Ordinary People Change World) The Anthropology of Climate Change: An Integrated Critical Perspective (Routledge Advances in Climate Change Research) The Change Monster: The Human Forces that Fuel or Foil Corporate Transformation and Change Switch: How to Change Things When Change Is Hard Change Your Questions, Change Your Life: 12 Powerful Tools for Leadership, Coaching, and Life