



### Volcanoes in America's National Parks.

Robert Decker and Barbara Decker. Odyssey Guides (Airphoto International Ltd, 903, Seaview Commercial Building, 21-24 Connaught Road West, Sheung Wan, Hong Kong). 2001. Paperback 256 pp. Price US \$ 25.

Volcanoes can be both terribly destructive and mesmerizingly beautiful. America is one of the largest and geographically most diverse countries, and some of the world's most active and famous volcanoes are found here. In fact, as of now, over 38 US national parks have volcanoes as the main theme, or with major supporting roles. The book under review, the latest among several volcano-related ones by the husband and wife team of Robert Decker (volcanologist) and Barbara Decker (science writer), is very interesting reading for anyone interested in the geology, environment, and wildlife of these American parks. It is certainly of interest to the Indian geologist, because although India's only active volcano Barren Island is situated rather far from most of us in the Andamans, so much of the rock forming the Indian landmass is of volcanic origin and as 'young' as 60 million years.

This book is a great introduction to American volcanoes, active, dormant ('sleeping'), and extinct. It is divided into four parts. Part 1, entitled 'Mountains of Fire', describes what volcanoes are, why they exist where they do, and how they work. A brief overview is presented of Plate Tectonics, the widely accepted theory which ascribes earthquakes, volcanoes, mountain building, and continental drift to the relative motions of huge 'plates' forming the Earth's strong outer shell. The widely accepted hotspot-mantle plume model is also presented as a valid explanation for linear chains of volcanic islands such as the Hawaiian chain, but a discussion of the shortcomings of this model is not attempted. The

purpose and emphasis of the book being very different from geodynamics, this is understandable. Also described in part 1 are volcanic features such as hot springs and geysers, and the products of volcanoes such as lavas and their physical properties, and ash eruptions.

Part 2, 'Volcanoes Alive', deals with those national parks that have volcanoes currently erupting, or volcanoes that have erupted in the 20th century. In the first category comes the Hawaii Volcanoes National Park, where the volcano Kilauea is erupting as of this moment, and the volcano Mauna Loa (Earth's largest) last erupted in 1984. The other volcanoes described are not erupting right now but certainly did so within the last century, some of the eruptions having been notoriously destructive. Parks with such volcanoes are the Mt St Helen's (Washington) and Lassen (California) parks, and several in Alaska (Aniakchak, Katmai, Lake Clark, and Wrangell-St. Elias). The eruptive history and activity of each of these major volcanoes are described at length, in a very lucid fashion.

Part 3, entitled 'Volcanoes Asleep', describes parks with dormant volcanoes, i.e. those that have not erupted within a century, but may well erupt in the future. These parks include the Haleakala (Hawaii), Mt Rainier (Washington), Crater Lake and Newberry (Oregon), and Yellowstone (Wyoming-Montana-Idaho) parks, and several National Monuments: Lava Beds, Devils Postpile, Death Valley and Mojave (California), Craters of the Moon (Idaho), Capulin and El Malpais (New Mexico), and Sunset Crater (Arizona). This last is just one among the 600 or so cinder cones which, along with a large, extinct, eroded stratovolcano (Mt Humphreys, 12,633 feet), form the so-called San Francisco volcanic field in northern Arizona.

Part 4, entitled 'Ancient Fires', is about volcanoes or parts of volcanoes that are long dead and are not expected to ever become active again. Among these are examples such as the 20,320-foot-high granite massif of Mt McKinley in Denali National Park, Alaska, the Devil's Tower plug or volcanic neck in Wyoming, old volcanic rocks in Arizona and New Mexico, and the granites of Yosemite and other parks in California. Such ancient granites arguably represent deep, solidified magma chambers now exposed at the Earth's surface due to removal of the

roof rocks through millions of years of erosion.

The book will be of much interest not only to geologists, but also to geographers, biologists, ecologists and several others, because although the main focus is on the volcanoes and the geology, a good deal can be learned about the physical environment and flora and fauna of the parks. Non-geologists should have few problems following the geological information after understanding the basic concepts explained in part 1. Twenty eight attractive, well-drafted shaded-relief maps of many of the national parks and monuments are provided, with practical travel information. Also given are a list of recommended books and websites (general and park-specific), a glossary of technical terms, and an index. The one inconvenience to lovers of kilometres and degrees centigrade such as myself is the usage of miles and degrees fahrenheit throughout the book, characteristic of the country in question.

The paper and printing of the book are of very high quality, but its greatest feature is that it is unusually well illustrated. The cover shows the beautiful, serene vista of Mt Rainier, and the inside is jam-packed with 225 colour photographs and a few black and white ones from all of the parks covered. Most photographs are of excellent quality, some being truly outstanding. They depict not only the volcanoes and their features (lava flows, geysers, etc.) but also many of the plants and animals native to these parks. Flower lovers will enjoy the fern fronds from Haleakala, or the Columbia lily from Lassen, and wildlife enthusiasts will be delighted to see the Yellowstone elk, or the Alaskan brown bear mama with two cute little cubs. It is hard not to recommend such a visually pleasing book for the relatively very low price of US \$ 25. This price may still be prohibitive for the individual Indian professional or student, but libraries would do well to have a few copies of this beautiful and highly readable book on their shelves for everyone to enjoy.

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