

59071

**ROADSIDE
GEOLOGY**
of New Mexico

Halka Chronic

MOUNTAIN PRESS PUBLISHING COMPANY
MISSOULA 1987



7179

Copyright © 1987
Halka Chronic

Seventh Printing, March 1995



The paper used in this publication meets the minimum requirements of the American National Standard for Permanence of Paper for Printed Library Materials Z39.48 — 1984.

Library of Congress Cataloging-in-Publication Data

Chronic, Halka.

Roadside geology of New Mexico.

Bibliography: p.

Includes index.

1. Geology—New Mexico—Guide-books.
2. Roads—New Mexico

I. Title.

QE143.C47 1986 557.89 86-21748

ISBN 0-87842-209-9 (pbk.)

Mountain Press Publishing Company

P.O. Box 2399

Missoula, MT 59806

1-800-234-5308

V

and Monuments

ents in New Mexico offer
ocks in a more leisurely
of them—Bandelier, Gila
and Salinas National
ic rds, all those de-
logic features, too.

ks, fossils, minerals, and
is permitted.

a canyon cut by the Frijoles
uring of explosive volcanic
shed the large volcano from

hich existed here about a
of the Valles Caldera at the
ny other New Mexico vol-
s that edge the west side of
ers of thick lava and ash,
e explosive eruptions, the
oly of the shape and size of
rose above a base of older
in the lower gorge of the
n years ago it reached its

*The welded tuff of Frijoles
Canyon erodes into strange
forms, its crusted surface
penetrated by numerous hollow
alcoves.*



Shortly after that, about one million years ago, the volcano burst forth with two extremely violent eruptions, spewing out incredible volumes of volcanic gases, ash, pumice, and broken rock. The Mt. St. Helens 1980 eruption was child's play by comparison: The Jemez eruptions released more than 50 cubic miles of rock material—roughly 100 times that discharged by Mt. St. Helens!

Ash clouds drifted as far as Iowa, Oklahoma, and Texas. Other ash sped down the flanks of the volcano in incandescent avalanches that finally came to rest far down on the mountain slopes. Still very hot, the incandescent particles welded together, forming a firm yet porous rock. The ash flows of the second great eruption now form the Bandelier tuff that walls Frijoles Canyon.

The explosions to some extent depleted the magma chamber far beneath the volcano. No longer supported from below, the mountain, ringed by fractures, collapsed. Its subsidence produced, at the surface, a vast caldera, an almost circular, cliff-ringed pit 14 miles across—the Valles Caldera, not within the national monument but well worth a visit.

Much of the Bandelier tuff represents two thick layers of volcanic ash. Their upper and lower margins, where they cooled most rapidly,