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Front Matter

(Usually includes Dedication, President's Message, & Conference Organizer's Message.)

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This is a section from the 1996 NMGS Fall Field Conference Guidebook.

Annual NMGS Fall Field Conference Guidebooks

Every fall since 1950, the New Mexico Geological Society (NMGS) has held an annual Fall Field Conference that explores some region of New Mexico (or surrounding states). Always well attended, these conferences provide a guidebook to participants. Besides detailed road logs, the guidebooks contain many well written, edited, and peer-reviewed geoscience papers. These books have set the national standard for geologic guidebooks and are an essential geologic reference for anyone working in or around New Mexico.

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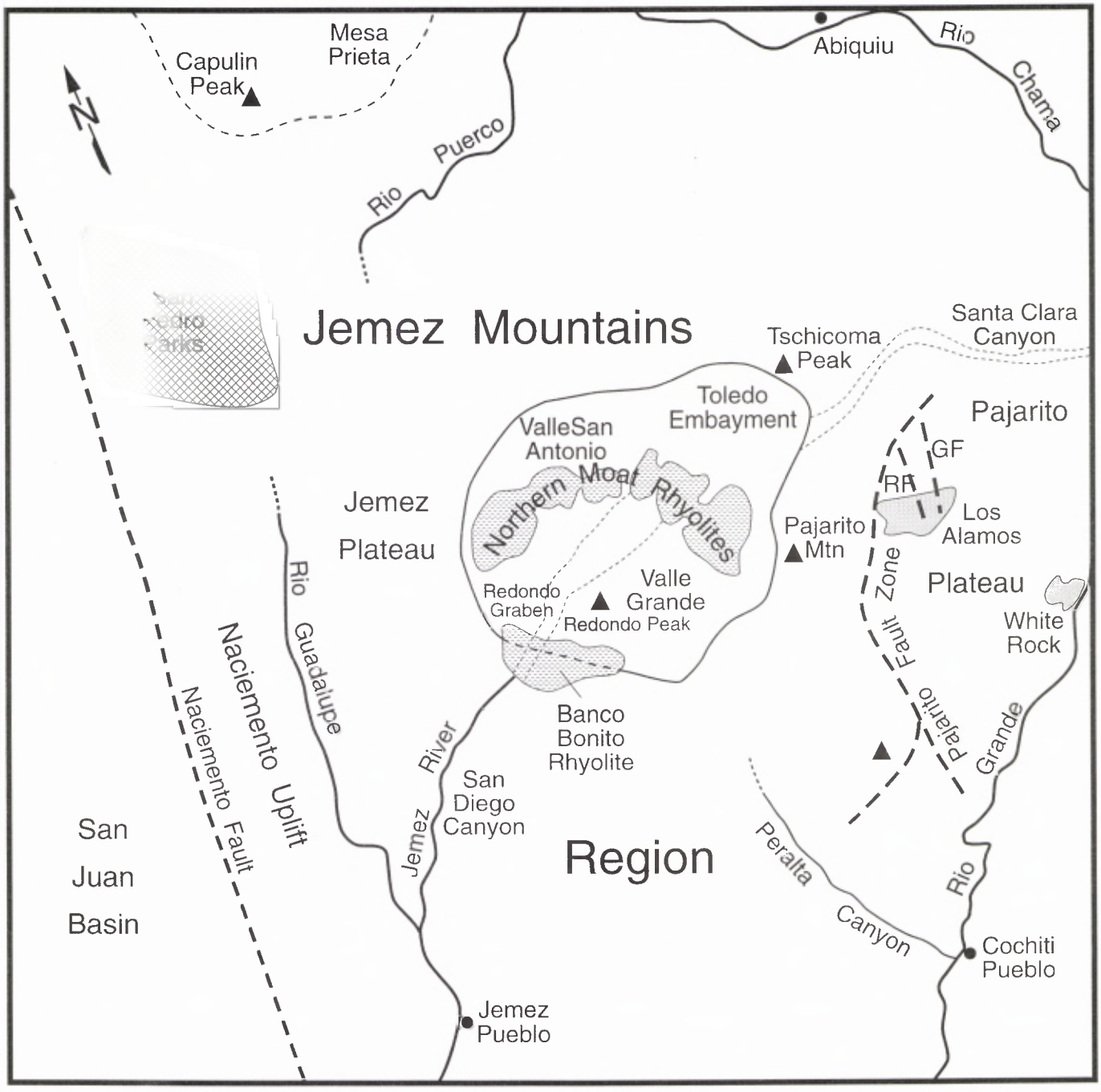
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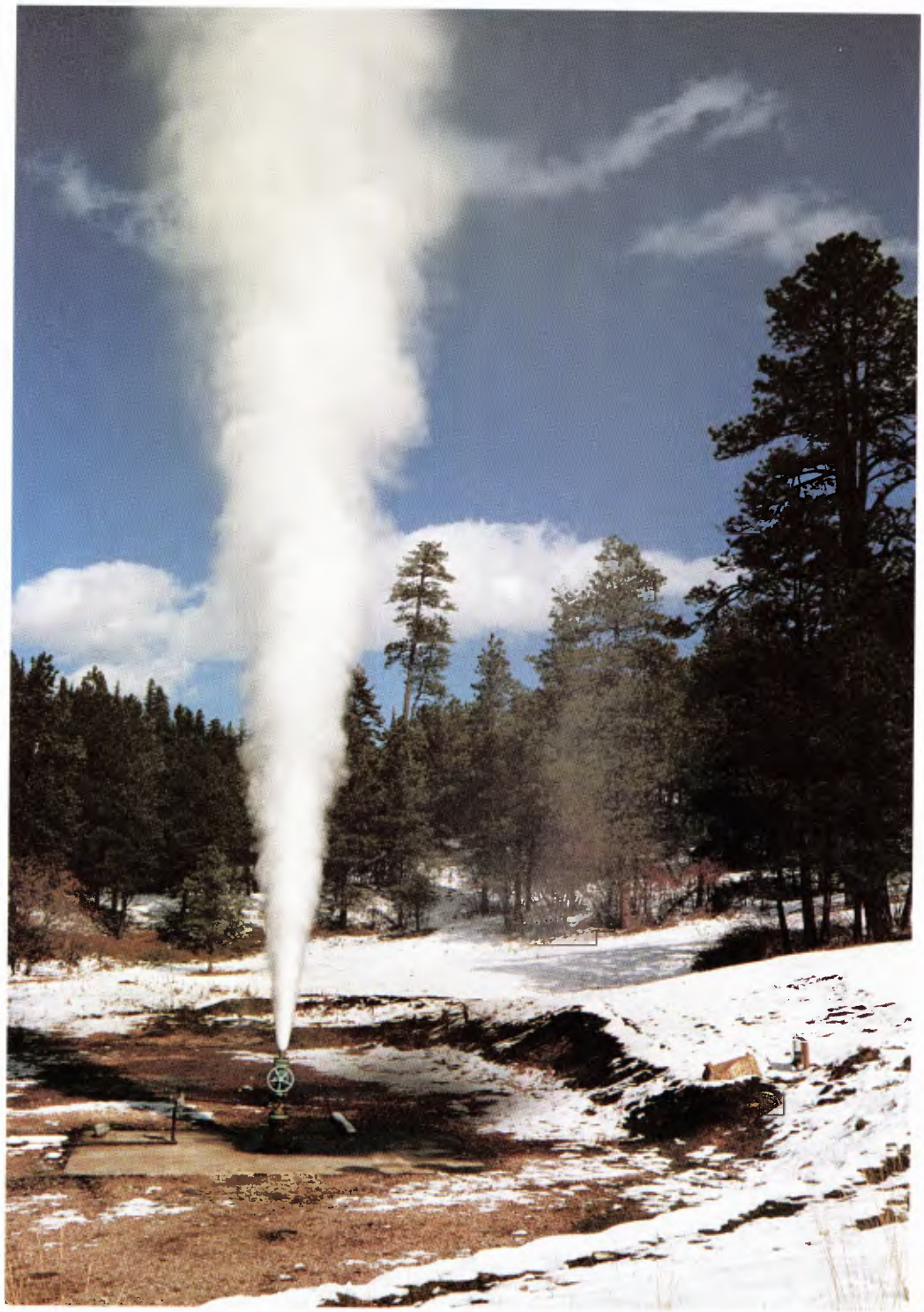
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Line drawing map of area shown in facing LANDSAT photo.



Scientific core hole VC-2B erupting flashed geothermal reservoir fluid during flow tests of November 1, 1991. Reservoir temperature averages 225°C. VC-2B, part of the Continental Scientific Drilling Program, was continuously cored to a depth of 5780 ft with over 99% core recovery, and bottom hole temperature of 295°C. It is the deepest, hottest, continuously cored hole in North America. Well head and valve assembly is more than 6 ft high (see Second-day road log, mile 39.9).

THE JEMEZ MOUNTAINS REGION

Editors

FRASER GOFF
BARRY S. KUES
MARGARET ANNE ROGERS
LES D. McFADDEN
JAMIE N. GARDNER



New Mexico Geological Society
Forty-Seventh Annual Field Conference
September 25-28, 1996



Cliffs of Bandelier Tuff in Ancho Canyon, Pajarito Plateau. Map units A-C (of Rogers, 1995) within the Tshirege Member of the Bandelier Tuffare shown al r%ni.
view

Dedication

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DEDICATION

James P. "Pat" Dunigan, 1924-1980



This guidebook is dedicated to the memory of Pat Dunigan, who developed the philosophy of protection and preservation of this unique natural wonder, the Valles caldera; and additionally to those of the Baca Land & Cattle Co. who have carried this philosophy through to this day.

Pat Dunigan grew up in the oil business. His grandfather ran an oil field shop in Pennsylvania. His father expanded that business into Oklahoma and then Texas where he was considered one of the real pioneers in oil development. Pat Dunigan expanded the family business further.

Before entering college in 1945, he served in the Army Air Corps during World War II. He held degrees from The University of Texas at Austin and New York University. Trained in banking and finance, he joined his father's firm, Dunigan Tool & Supply Co., in 1950 and became president in 1962. Besides the energy field, Pat Dunigan's interests included the financial, banking, investment, and development fields. His purchase of the 100,000 acre Baca Ranch in 1963 served a variety of his interests. The ranch tract, part of an exchange for a disputed Spanish land grant, contains the Valles caldera.

The Baca is a working ranch where Pat Dunigan explored geothermal resources and established the selective cutting of timber from old stands of trees.

Margaret Anne Rogers

PRESIDENT'S MESSAGE

"They were the youngest of mountains, they were the oldest of mountains..." Where else in the world can we stand in a fifteen mile-wide Quaternary caldera and look ten miles west for the record of a Proterozoic crustal collision? The Valles Caldera of the Jemez Mountains and the Precambrian remnants of theYavapai and Mazatzal terranes exposed in the Nacimiento Mountains represent some of the youngest and oldest evidence exposed in New Mexico of the spectacular geologic history that came before geologists to New Mexico. This region, in close proximity to Los Alamos National Laboratories, is the setting for the 1996 New Mexico Geological Society Fall Field Conference.

Your New Mexico Geological Society is very healthy financially, with liquid assets over $210,000 and a publications inventory valued at over $350,000! Last year was an excellent, albeit anomalous year. We logged $109,000 of income against $71,000 of expenses, primarily due to generous scholarship donations and the exceptional performance of our investments. Publication sales continue to be our strongest source of income, constituting one-third of the total. NMGS will award over $ 7,000 of scholarships in 1996, to support both undergraduate and graduate geoscience education in New Mexico. Through prudent management of our assets, we're able to offer our members world-class field conferences and high-quality guidebooks at reasonable prices.

Our 1997 Fall Field Conference will be held in the Four Corners region of northwestern New Mexico and adjacent areas of Utah, Colorado, and Arizona. Trip leaders Orin Anderson and Spencer Lucas promise enlightening stops and exciting presentations. In 1998, we'll visit the "Las Cruces country" of south-central New Mexico, showcasing many of the new geological insights gained since our last trip there in 1975! In 1999 we'll hold the 50th NMGS field conference, and we're planning an appropriately "golden" Fall Field Conference and guidebook. Also scheduled for completion in 1999 is a revised Highway Geological Map, based on the new digital geologic map of New Mexico being assembled by the NMBM&MR and including the latest satellite imagery.

The first NMGS Field Conference was held in 1950, with Vin Kelley as general chairman, Charlie Read as road logging chairman, and Clay Smith as logistics coordinator. Harrison Schmitt was NMGS president, and E.J. Workman and Tom Popejoy welcomed the society to their turf. This year we owe our gratitude and appreciation to General Co-Chairmen Margaret Anne Rogers and Barry Kues. Margaret Anne has made an especially significant contribution this year, well beyond the "pulling a rabbit out of a hat" that our chairmen historically accomplish. Margaret Anne was instrumental in securing access for our contingent onto the rarely visited Baca Ranch, comprising some of the most scenic and geologically significant portions of the Valles Caldera. We sincerely thank the Baca Land and Cattle Company and Walt Cramer, its president, for permission to spend the second day of the field conference on their land. Support from geoscientists at Los Alamos National Laboratory has also been critical to the success of this field conference, reflected in the numerous papers, major road-logging participation, and financial support to publish a longer guidebook than in previous years. With 50 papers and about 500 pages, this hard-cover guidebook will be the largest publication the society has ever produced. Barry has performed double duty this year, as co-chairman and managing editor of this year's voluminous guidebook. Margaret Anne and Barry have also managed the Herculean task of road logging, trip logistics and organizing the efforts of many volunteers. Charles Chapin has been a contributing member of the New Mexico Geological Society for many years, and Chuck continues to support NMGS as Director of the New Mexico Bureau of Mines and Mineral Resources. Norma Meeks (publications) and Debbie Goering (membership) are two NMBM&MR staffers whose dedicated service continues to keep NMGS running through annual Executive Committee transitions.

Many other volunteers too numerous to name have contributed to the success of this year's field conference and guidebook. I encourage and challenge all members to become more actively involved. Your NMGS is one of this country's premier regional geological societies, due to the quality of its membership and the hard work of an army of volunteers. THANKS TO YOU ALL!

David Schoderbek

EDITORS' MESSAGE

This is the first time that a New Mexico Geological Society Field Conference has focused entirely on the Jemez Mountains region. Previous trips through this area were long ago and relatively brief—the third day of the 1962 conference (Albuquerque-Jemez Springs-Los Alamos-San Felipe Pueblo), and the third day of the 1974 conference (Abiquiu-Los Alamos-Jemez Springs-Bernalillo). Articles or photos touching upon the geology of the Jemez Mountains region have also appeared in Guidebooks 30 (1979), 33 (1982), 35 (1984), 43 (1992) and 46 (1995). It seems that the Jemez Mountains region is a part of a lot of people's "country," but has never received a thorough examination by the N.M.G.S. before. This conference is overdue, as the Jemez Mountains combines wonderful scenery, diverse and world-renowned geological features, and intensive recent studies by many investigators, some from perspectives not available or considered important in the 1960s and 1970s. The great interest in the Jemez region by dozens of earth scientists at numerous institutions is amply demonstrated by the size of this guidebook—with 50 papers, three detailed road logs, and about 500 pages, this is the largest single volume ever published by the New Mexico Geological Society.

This field conference was first proposed by Cochairman and Coeditor Margaret Anne Rogers in 1986, as a possibility for 1989. It has taken 10 years for this Jemez Mountains conference to become a reality, and the fact that we will be seeing and learning about this area in detail in 1996 is in large part due to Margaret Anne's tenacious efforts at all levels through the years. The conference was conceived and proposed to represent the incredible variety of geoscience research that has been, and is being conducted in this region. We hope that this conference and guidebook do justice to these goals. The composition of this guidebook speaks for those who truly believe that significant scientific advances can be made from our collective observations, studies and experiences.

We enjoy, with this guidebook and conference, the rich geoscientific offerings of this region only with the extraordinary hard work and commitment and generous cooperation of many people. Production of this book was aided greatly by support from Los Alamos National Laboratory, by the careful word-processing of edited manuscripts by Lynne Hemenway and Terry Tellis (N.M. Bureau of Mines and Mineral Resources), and by the traditional high-quality work of the folks at UNM Printing Services, especially Don Leister. Walt Cramer and Brian Dunigan, Baca Land and Cattle Company, allowed access to Baca Ranch lands for road logging and photography, the results of which constitute the second-day road log. And of course, there would be no guidebook without the contributions of the authors of its contents. This year, more than 130 different individuals participated as authors of the articles and road logs, bringing together an enormous amount of information that will make this volume an indispensable reference for all who are interested in the geology and geological environment of the Jemez Mountains.

We also acknowledge the contributions of many other individuals and institutions below, who assisted with the guidebook and/or the field conference, although we realize that there may be some who contributed whose names do not appear here. To all of these folks, our heartfelt thanks are no less sincere.

In somewhat random order, we thank EES-1, CST-7, the Environmental Restoration Program, Seismic Hazards Program and Geothermal Program at LosAlamos National Laboratory; Pat Longmire, Bill Sprouse, Diane Banegas, Anthony Garcia, Eric McDonald and Cindy Werner, Los Alamos National Laboratory; Christie Rogers, University of Texas, Austin; Jemez and Zia Pueblos; Santa Fe National Forest; John Corbin of Sulphur Springs; Ken Horton, Los Alamos Police Department; George Young, La Mesa Search and Rescue; Heddy Dunn, Los Alamos Historical Society; Georgia Strickfaden, Buffalo Tours; John Rhoades, Bradbury Science Museum; the Los Alamos Chamber of Commerce; Los Alamos Aquatomics Swim Team, United Methodist Women of Los Alamos; Tom Merson, Los Alamos Geological Society; and the County of Los Alamos.

Fraser Goff Barry Kues, Margaret Anne Rogers, Les McFadden, Jamie Gardner

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FIELD CONFERENCE SCHEDULE

Wednesday, September 25—Registration Day

4:00-8:00 p.m.	Registration at Sheraton Uptown Hotel, northeast corner of Menaul and Louisiana, Albuquerque
5:00-8:00 p.m.	Icebreaker and snacks, Sheraton Uptown

Thursday, September 26—First Day

7:00 a.m.	Assemble at First Day starting point, north side of Bernalillo
12:00 noon	Lunch provided
6:00 p.m.	Arrive in Los Alamos
6:30 p.m.	Banquet buffet at Fuller Lodge, Los Alamos; tours of nearby Los Alamos Historical Museum and Los Alamos Lab Museum
8:30 p.m.	Speaker: Hal K. Rothman, Historian, "The Pajarito Plateau Before the Bomb.-

Friday, September 27—Second Day

6:00 a.m.	Breakfast at Sullivan Field, Diamond Drive, Los Alamos
7:00 a.m.	Depart from Sullivan Field in 15-passenger vans
12:00 noon	Lunch provided
5:30 p.m.	Return to Los Alamos
6:00 p.m.	Barbecue dinner at North Mesa picnic grounds, Los Alamos

Saturday, September 28—Third Day

6:00 a.m.	Breakfast at Sullivan Field, Los Alamos
7:00 a.m.	Depart from Sullivan Field
12:00 noon	Lunch provided
5:30 p.m.	Field Conference ends at Tent Rocks, near Cochiti Pueblo

CREDITS

Front Cover: Generalized map of the Jemez Mountains region, Fraser Goff, Los Alamos National Laboratory.

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