New Mexico Geological Society

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Front Matter

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

in:
Mogollon Slope (West-Central New Mexico and East-Central Arizona), Chamberlin, R. M.; Kues, B. S.; Cather, S. M.; Barker, J. M.; McIntosh, W. C.; [eds.], New Mexico Geological Society 45th Annual Fall Field Conference Guidebook, 335 p. https://doi.org/10.56577/FFC-45

This is a section from the 1994 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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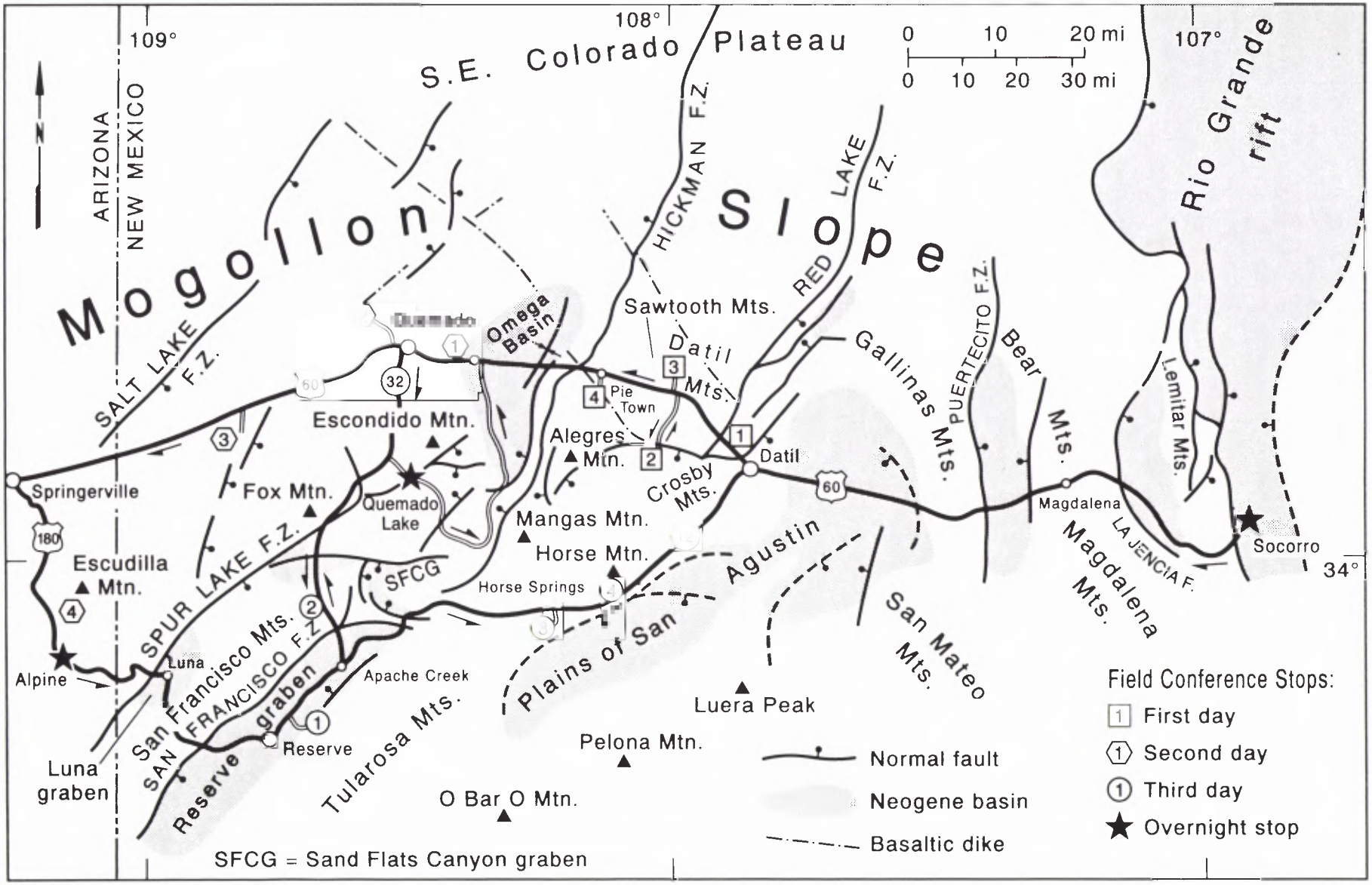
NMGS has decided to make peer-reviewed papers from our Fall Field Conference guidebooks available for free download. This is in keeping with our mission of promoting interest, research, and cooperation regarding geology in New Mexico. However, guidebook sales represent a significant proportion of our operating budget. Therefore, only *research papers* are available for download. *Road logs*, *mini-papers*, and other selected content are available only in print for recent guidebooks.

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109°
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N
ARIZONA
NEW MEXICO
Mogollon Slope
S.E. Colorado Plateau
Rio Grande rift
SALT LAKE F.Z.
HICKMAN F.Z.
RED LAKE F.Z.
PUERTECITO F.Z.
LA JENCIA F.
SPUR LAKE F.Z.
SAN FRANCISCO F.Z.
Omega Basin
Sawtooth Mts.
Datil Mts.
Gallinas Mts.
Bear Mts.
Lemitar Mts.
Magdalena Mts.
San Mateo Mts.
Crosby Mts.
Tularosa Mts.
Plains of San Agustin
Luera Peak
Pelona Mtn.
O Bar O Mtn.
Escondido Mtn.
Alegres Mtn.
Mangas Mtn.
Horse Mtn.
Fox Mtn.
Escudilla Mtn.
Springerville
Quemado
Quemado Lake
Pie Town
Datil
Magdalena
Socorro
Alpine
Luna
Apache Creek
Reserve
Horse Springs
SFCG
Luna graben
San Francisco graben
Reserve graben
SFCG = Sand Flats Canyon graben
Field Conference Stops:
1 First day
1 Second day
1 Third day
Overnight stop
Normal fault
Neogene basin
Basaltic dike



Cowboys ready to ride from the Navajo Lodge in Datil, New Mexico, ca. 1920. Photograph courtesy of Buz and Beverly Easterling, Quemado Lake Estates.

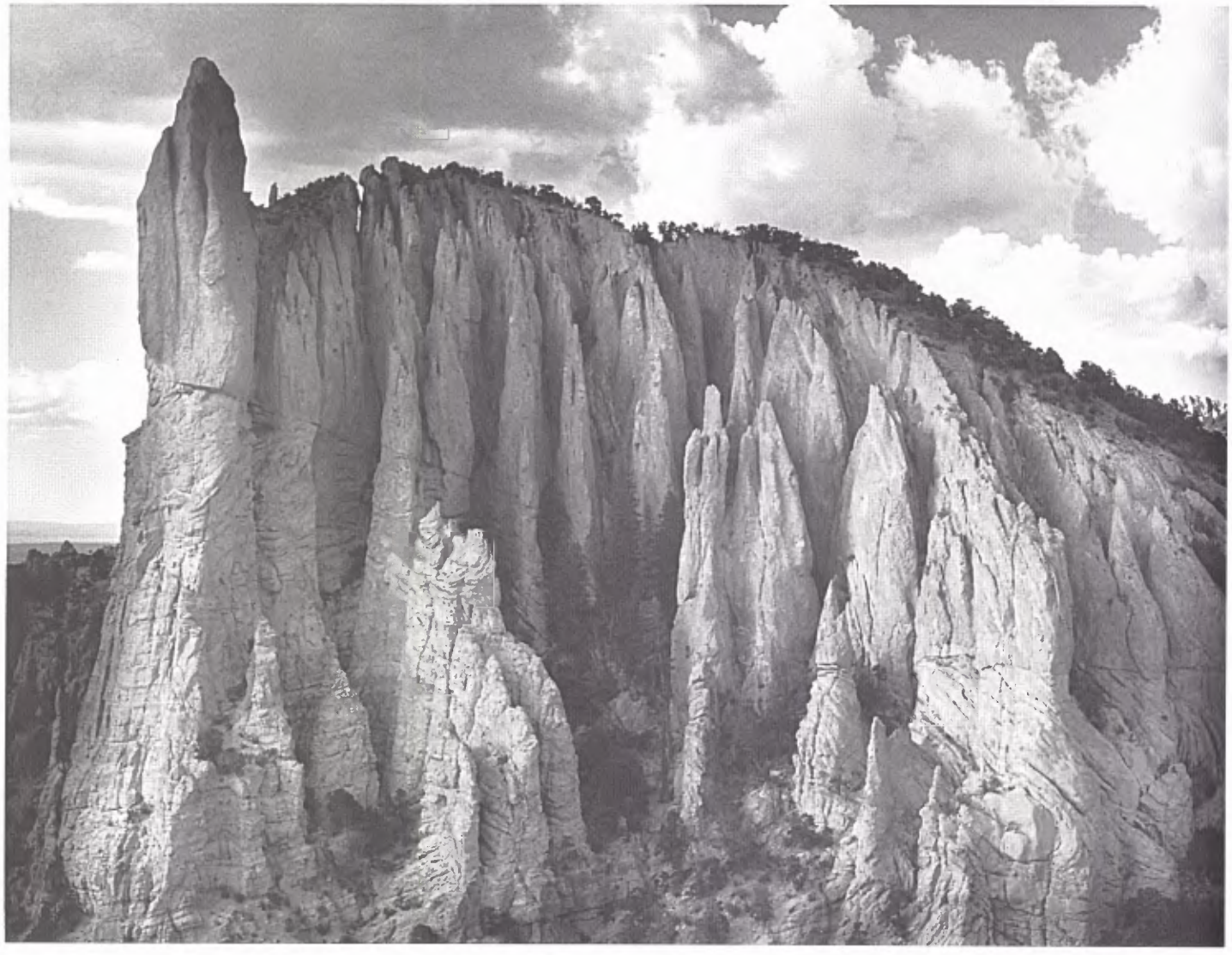
Mogollon Slope, West-Central New Mexico and East-Central Arizona

Editors

RICHARD M. CHAMBERLIN
BARRY S. KUES
STEVEN M. CATHER
JAMES M. BARKER
WILLIAM C. MCINTOSH



New Mexico Geological Society
Forty-Fifth Annual Field Conference
September 28–October 1, 1994



This spectacular south-facing cliff (Peak "8919") in the eastern Sawtooth Mountains provides a cross-section view of soft-sediment deformation and liquefaction-related structures in the upper Eocene Dog Springs Formation. Regional soft-sediment deformation of these argillaceous andesitic sandstones and overlying andesitic debris-flow deposits may have been triggered by a major seismic event in late Eocene time. An ESE-dipping low-angle fault, rising to the left, juxtaposes steeply ENE-dipping debris-flow beds on upper right with underlying strongly folded sandstones. Note thick sandstone bed, doubled up in an east-plunging isoclinal fold on lower right. This cliff is approximately 150 m high on its west face, to the left. Photograph by Richard M. Chamberlin, photographic enhancement by William DeMarco, DeMar Co., Photographics.

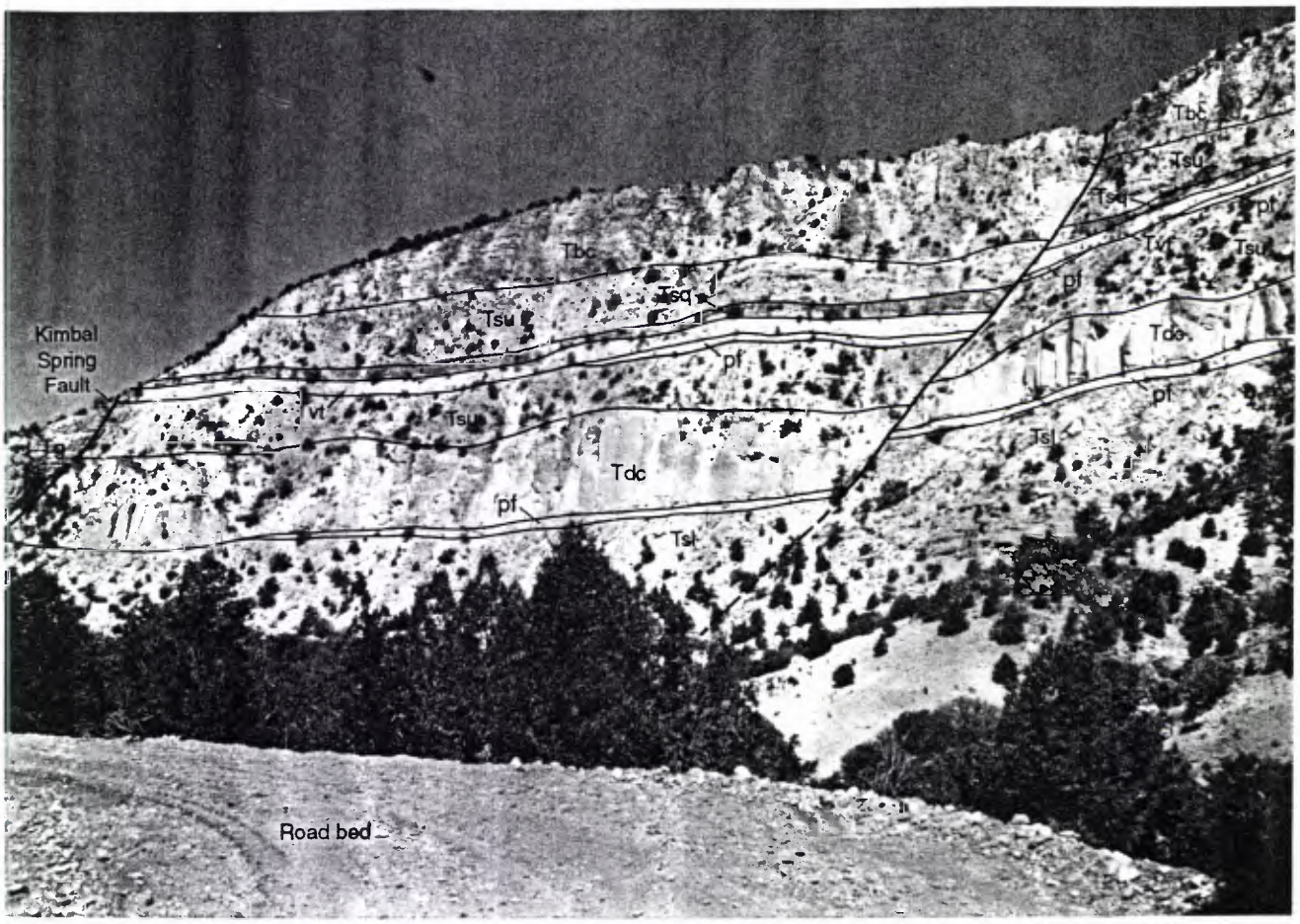


Figure 3.15, p. 93 of New Mexico Geological Society Guidebook 45, 1994.

The stratigraphic overlay for this figure was printed incorrectly. The photocopy on this sheet shows the overlay in proper registration. This photocopy may be cut out and pasted over the printed copy.

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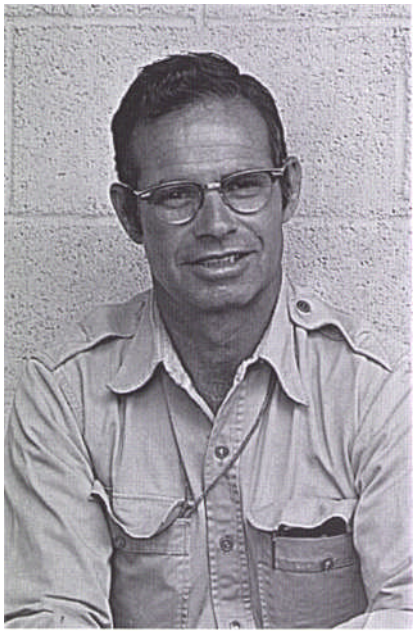
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DEDICATION





The 1994 NMGS Guidebook is dedicated to James C. Ratte, a USGS geologist who has mapped in southwestern New Mexico for nearly 30 years. He is widely known not only to fellow geologists, but also to ranchers, packers, foresters, miners, and other local residents throughout the area.

Originally from Vermont, Jim joined the U.S. Navy in 1943. After the war ended, he completed an undergraduate degree in Geology at Michigan State University in 1950, marrying Fran Brut in his Junior year. (He and Fran have raised five daughters and celebrate their 45th wedding anniversary this year.) Jim earned his Master's degree from Dartmouth in 1952, and followed this with a year of study at Cal Tech. He began his 40-year career with the U.S. Geological Survey in 1953, and immediately began work in the San Juan volcanic field in Colorado. Jim, together with Tom Steven, delineated calderas and ignimbrites in the Creede and Summitville areas, laying the foundations of understanding for what is now probably the best studied large silicic volcanic field in the world. Following his work in the San Juan Mountains, Jim spent several years evaluating mineral and water resources in South Dakota, then turned his attention to the Mogollon-Datil volcanic field in southwestern New Mexico. From 1967 to 1970 Jim and his family spent summers in the area between Alpine and Glenwood, mapping wilderness and primitive areas as part of the U.S.G.S. resource evaluation program. Since 1970 Jim has returned nearly every spring and fall to continue field mapping in southwest New Mexico. Jim received the Meritorious Service Award from the Department of the Interior in 1988 and officially retired in 1993, but is continuing his work for the U.S.G.S. as scientist emeritus.

Of the 89 publications attributed to Jim Ratte by GEOREF, 58 are concerned with New Mexico geology. The remainder pertain to the geology of widely ranging areas including Colorado, South Dakota, Alaska, Saudi Arabia, and Bolivia. Jim's New Mexico publications include more than 10 quadrangle maps, numerous smaller scale maps, several journal articles, and five N.M.G.S. guidebook contributions. Although he has concentrated on mapping, stratigraphy, and mineral potential of Cenozoic volcanic rocks, Jim's work has included volcanology, geochemistry, and geochronology. His fundamental contributions to the geology of the Mogollon-Datil volcanic field include development of a regional stratigraphic framework, determining the location, relative age, and structure of calderas, mapping the distribution of ignimbrite sheets and eruptive vents of lavas, characterizing mineralization, and deciphering regional structure.

Above all, Jim Ratte is known for the quality, quantity, accuracy, and thoroughness of his geologic mapping. Even now, as black box geology continues to become more fashionable and fundable than mapping, Jim continues to go into the field and produce first quality maps in geologically and topographically challenging volcanic terrain.

In addition to his geological talents, Jim Ratte is a kind, polite, and generous human being. He always has abundant time to help and advise other geologists, especially students. Also, as evidenced by the photos above, Jim does not age at the same rate as the rest of us. Although officially a "scientist emeritus" he is continuing his work in New Mexico and can still walk the legs off most younger geologists.

W. C. *McIntosh*

PRESIDENT'S MESSAGE

Welcome to this year's New Mexico Geological Society Field Conference—our forty-fifth! The Society is more than half-way through its fifth decade and quickly approaching its fiftieth anniversary. The long history of the Society reflects the hard work and dedication of the many individuals who have contributed their time, expertise and efforts over the years to the success of the organization.

This conference is the collective brainchild of general chairpersons Richard Chamberlin and Jim Ratte with additional insights from Steve Cather. Northeastern Catron County was last visited as part of the tenth Society Field Conference in 1959, so a new look is welcome and overdue.

Organizing this trip and publishing the guidebook required tremendous efforts by numerous people, most of whom responded "above and beyond the call of duty." Such people are necessary for the success of the trip and the publication of the guidebook, and are many times taken for granted. Many of the volunteers are listed by committee in the front matter of this guidebook. Please take the opportunity to thank these individuals because without their support, organizing future trips and guidebooks would be more challenging than it already is.

The Society is and has been basically self-supporting, in the sense that no outside financial support is necessary to keep its activities and publications progressing from year to year. The economic health of the Society seems to have stabilized in recent years, and appears to be quite good, particularly when we reflect on the status and future of the oil and gas, and mining industries in this country. The principal source of revenue for the Society is publication sales, which were down nearly 11 percent in 1993. Additionally, the cost of publishing new guidebooks and operating costs are increasing. Therefore, the Society has taken some steps to lower the cost of publishing the guidebooks and reduce the number of guidebooks in storage. This has also involved streamlining the process of putting the guidebook together, using less-costly materials, while maintaining the quality we're accustomed to.

The ability to award annual scholarships and fellowships, totaling several thousand dollars, is a point of pride for the Society. The Society has benefitted from recent donations by Ms. Lucille Pipkin and the Wellnitz family. The Society's current scholarships include the Beverly A. Wellnitz Memorial Scholarship, the Kottlowski Fellowship, the Wellnitz Fellowship, the Pipkin Book Scholarships and the Grants-in-Aid. These funds are awarded annually to deserving geology students at New Mexico universities and colleges. The Society also benefits greatly from the continued support of Chuck Chapin and the New Mexico Bureau of Mines and Mineral Resources.

This year's conference will provide an opportunity to see and appreciate an area of New Mexico and Arizona which hasn't been visited by the Society in many years. I hope you enjoy the trip and have a great time!

Bob Newcomer, President

EDITORS' MESSAGE

The 1994 New Mexico Geological Society Fall Field Conference journeys through the serene outback of northeastern Catron County, New Mexico and part of adjacent Apache County, Arizona. We refer to this scenic terrane of volcanic capped ranges on the northern periphery of the Mogollon-Datil volcanic field and the downwarped southern margin of the Colorado Plateau as the Mogollon slope. This area was last visited by the Society in 1959 as numerous reconnaissance maps of west-central New Mexico were being completed in preparation for the now familiar geologic map of New Mexico by C. H. Dane and G. 0. Bachman (1965). For the last 35 years our geologic understanding of west-central New Mexico has developed on a foundation laid by Frank Kottlowski, John Shilling, Robert Weber, Max Willard, Roy Foster, Clay Smith, Gus Armstrong, Sherm Wengerd, Charlie Stearns, Carl Dane and George Bachman, just some of the contributors to the 1959 guidebook. Robert Weber, now retired, here again contributes to the Society's collective knowledge with his description of pluvial lakes of the Plains of San Agustin. Also Clay Smith and his colleagues of the Socorro Lions Club will cater a barbecue and breakfast among the pines at the old Quemado Lake campground; the only place we could find to put 100 or more "rock-nockers" overnight in northern Catron County.

New regional geologic maps of the Tularosa Mountains 30' x 60' quadrangle by Jim Ratte and the late Tommy Finnell; and the Quemado 30' x 60' quadrangle by Richard Chamberlin, Steve Cather, Orin Anderson and Glen Jones provide the geologic picture of the field conference area. As with the previous generation of maps in this area, the impetus for new regional maps is the upcoming geologic map of New Mexico (Anderson and Jones, in preparation) which will supplant the map of Dane and Bachman. Bill McIntosh and Matt Heizler at the New Mexico Geochronology Research Laboratory provided high-precision $^{40}Ar/^{19}Ar$ ages for regional ignimbrite sheets and lavas that represent critical time lines on these maps.

The 26 articles, 23 minipapers and 4 road logs that comprise this guidebook represent a new geological understanding of west-central New Mexico, adjacent parts of the Mogollon-Datil volcanic field and the southern Colorado Plateau.

In addition to the many volunteers listed in the credits and committees, we here express our appreciation to all individual contributors to the guidebook and field conference as listed in the table of contents. Our special thanks to Chuck Chapin, State Geologist and Director of the New Mexico Bureau of Mines and Mineral Resources, who generously provided personnel, word processing, cartographic drafting, secretarial help, photographic work, vehicles and helpful encouragement. Lynne Hemenway and Terry Telles quickly and pleasantly typed most of the guidebook. Many quality line drawings and illustrations were cheerfully and expertly made by Rebecca Titus, Kathryn Campbell and Jesse Dengate. Tasty lunches will be provided by Xi Theta Chapter of Beta Sigma Phi, Socorro.

Finally, our thanks to all landowners and citizens of Catron County who have graciously permitted access through their property to examine the rocks that make up the Mogollon slope.

Richard M. Chamberlin, Barry S. Kues, Steven M. Cather, James M. Barker, William C. McIntosh

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James M. Barker ..... New Mexico Bureau of Mines and Mineral Resources
Gretchen K. Hoffman ..... New Mexico Bureau of Mines and Mineral Resources

1994
FIELD CONFERENCE SCHEDULE

Wednesday, September 28—Registration Day

4:00-8:00 p.m.	Registration: Lower lobby of Macey Center, New Mexico Tech, Socorro, New Mexico.
6:00-9:00 p.m.	Icebreaker: North patio of Macey Center, Socorro, New Mexico.

Thursday, September 29—First Day

7:30 a.m.	Assembly point, frontage road at State Forestry Division Office; approximately 1 mile west of Socorro on U.S. 60. Registration for late arrivals at first stop.
7:45 a.m.	Caravan departs headed west on U.S. 60 for tour of Cenozoic structure and stratigraphy of the Datil-Pie Town region. (Lunch provided)
5:00 p.m.	Arrive at campgrounds of Quemado Lake Recreation Area. Camp at older facility southeast of Quemado Lake. No potable water, but modern looking outhouses.
6:00-7:30 p.m.	Catered outdoor barbecue at Quemado Lake campground.

Friday, September 30—Second Day

6:30-7:30 a.m.	Catered outdoor breakfast at Quemado Lake campground.
7:45 a.m.	Assembly Point, southeast end of Quemado Lake campground on FR 13.
8:00 a.m.	Caravan departs for tour of Mangas Mountains and the Quemado-Red I lill-Alpine region. (Lunch provided)
*5:00 p.m.	Arrive Alpine. Arizona. (local time 4:00 p.m.)
*6:30-8:00 p.m.	Banquet at Alpine Country Club, Alpine, Arizona
*8:00 p.m.	Speaker: Dr. Richard V. Fisher, Prof. Emeritus, University of California Santa Barbara. "Catastrophic volcaniclastic sedimentation."

Saturday, October 1—Third Day

*7:00-7:50 a.m.	Breakfast at Alpine Country Club, Alpine, Arizona
*7:50 a.m.	Assembly point, parking area at Alpine Country Club.
*8:00 a.m.	Caravan departs for tour of Reserve graben, Apache Creek and Horse Springs areas. (Lunch provided)
4:00 p.m.	Conference ends at Horse Springs, —20 miles south of Datil.

* Schedule in Arizona will be on New Mexico time (Mountain *daylight* time).

CREDITS

Front Cover: Eastern Sawtooth Mountains, color separation by Starline Printing Co., from a slide by Richard M. Chamberlin, New Mexico Bureau of Mines and Mineral Resources.

Front End Sheets: Satellite image, Jane C. Love, New Mexico Bureau of Mines and Mineral Resources; Trip diagram, Rebecca Titus, New Mexico Bureau of Mines and Mineral Resources.

Photography: Steve M. Cattier and Richard M. Chamberlin, New Mexico Bureau of Mines and Mineral Resources; William DeMarco, De Mar Co. Photographics: and James C. Ratte, U.S. Geological Survey, retired. Historical Photographs: Kenneth and Carol Coker, Eagle Guest Ranch; Buz and Beverly Easterling, Quemado Lake Estates; and Jimmy and Irene Jaramillo, El Sarape Cafe.

General Interest Photographs: Richard M. Chamberlin, New Mexico Bureau of Mines and Mineral Resources; Kelly D. Gatlin. La Luz Photograph y; and Wayne Lambert, West Texas A & M University, assisted by Kirby Hoffman and supported by a grant from Killgore Research Center, West Texas A & M University.

Drawings: Louann C. Jordan, Santa Fe.

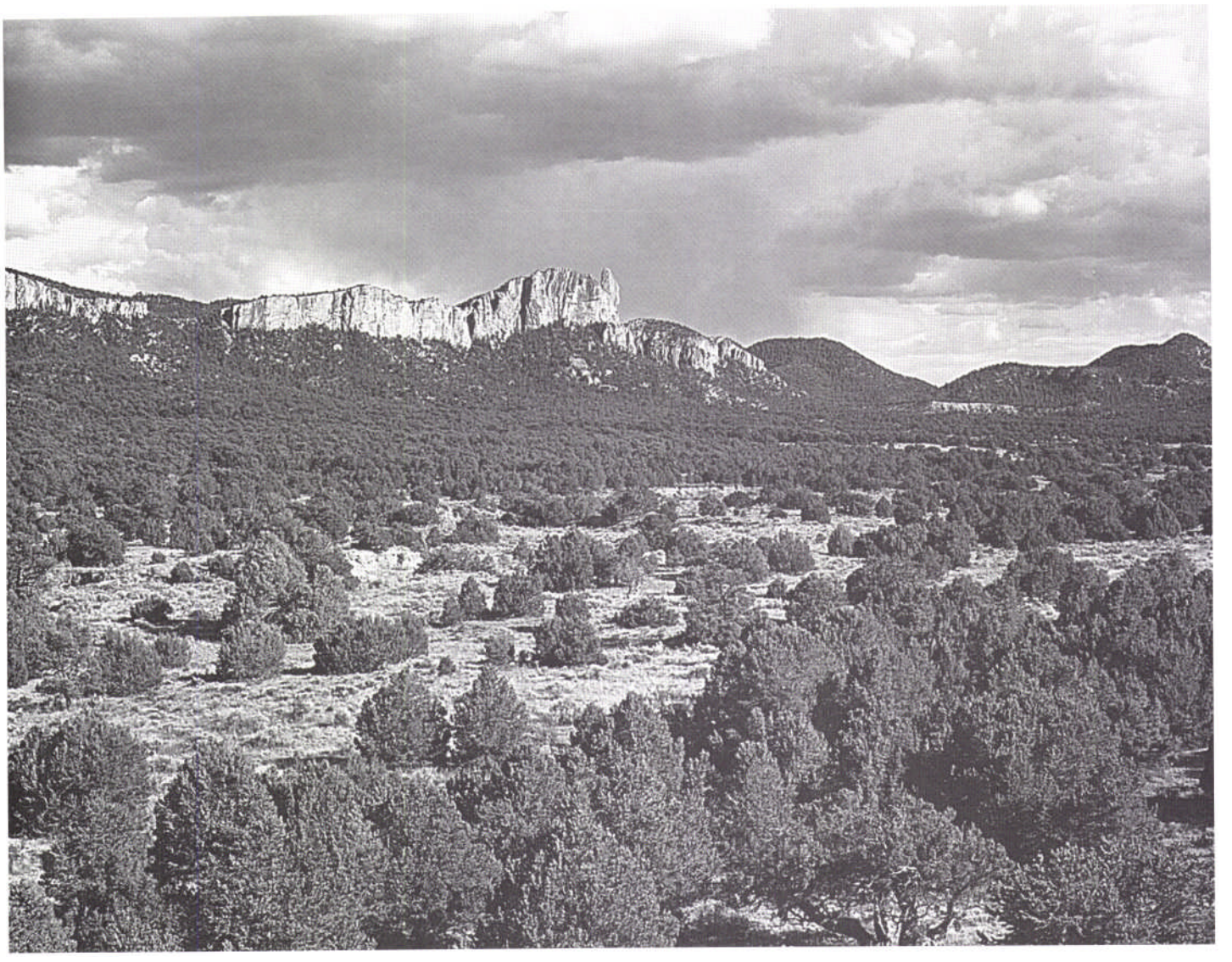
Word Processing: Lynne Hemenway, Terry Telles, and Theresa Lopez, New Mexico Bureau of Mines and Mineral Resources.

Drafting: Rebecca Titus, Kathryn Campbell and Jesse Dengate, New Mexico Bureau of Mines and Mineral Resources.

Printer and Graphic **Design:** Starlins Printing Company

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The articles and road logs in this guidebook were prepared for the 45th annual field conference of the New Mexico Geological Society, held in west -central New Mexico and eastern Ark/Erna, on September 28-October 1994. No part of this publication may he reproduced, stored in a retrieval system, or transmitted in any form or by any means, electronic, mechanical. phot vopying. recording. or otherwise, without the prior *written* permission of the New Mexico Geological Society, Inc.



Cliffs of upper Eocene Dog Springs Formation in the eastern Sawtooth Mountains approximately 25 km northwest of Datil, New Mexico. view is S26°E. Lo cation of Stop 3, first day, is below and right of the tooth-like pillar. Pillar and upper half of cliff face to left consist of nearly vertical dacitic debris-flow beds above a subhorizontal decollment or detachment fault. Highly contorted and folded dacitic sandstone beds below the subhorizontal fault grade downward into gently dipping sandstones conformable with the underlying Baca Formation. Pifion-juniper woodlands on lower slopes generally mask the underlying Baca Formation; ponderosa pine is present on the higher slopes. Camera station is in NE/4 sec. 4, TIN, R11W. Wayne Lambert photograph No. 93L48. August 11, 1993, 5:33 pm MDT.