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Front Matter

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

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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.

Free Downloads

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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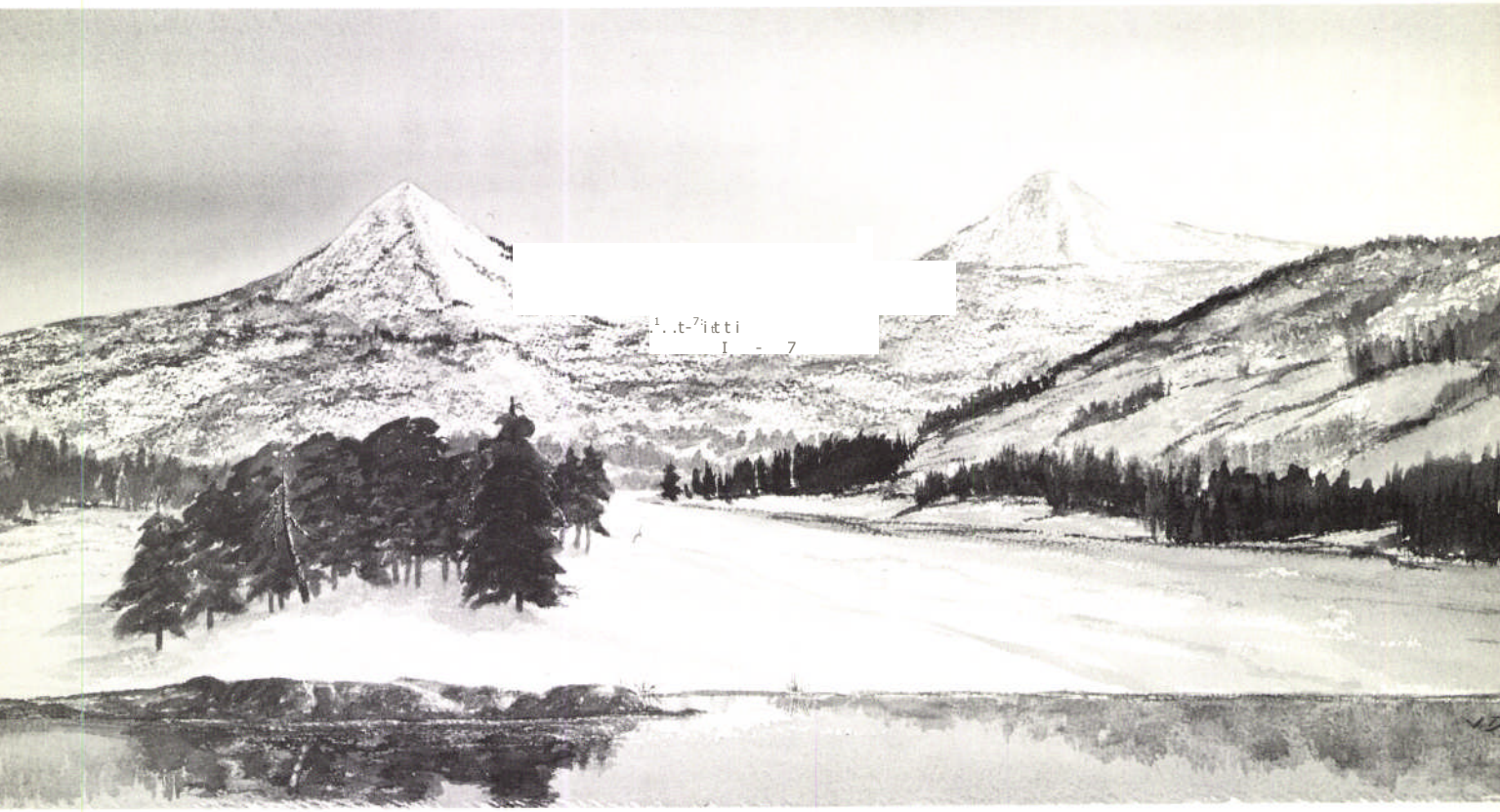
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GUIDEBOOK OF VERMEJO PARK

NORTHEASTERN NEW MEXICO

, Editors
RODNEY C. EWING BARRY S. KUES



NEW MEXICO GEOLOGICAL SOCIETY

TWENTY-SEVENTH FIELD CONFERENCE—September 30, October 1 and 2, 1976

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1976

Picture of the officers and committee chairpersons of the New Mexico Geological Society for 7976. Top row, left to right: Harold L. James, General Chairman, Fall Field Conference, N.M. Highway Dept., Santa Fe; James M. Robertson, Treasurer, N.M. Bureau of Mines & Mineral Resources, Socorro; Anne K. Loring, Secretary, Conoco, Albuquerque; Russell E. Clemons, Past President, N.M. State University, Las Cruces; George S. Austin, Chairman, Publications Committee, N.M. Bureau of Mines & Mineral Resources, Socorro; Charles L. Pillmore, Chairman, Road Logging Committee, U.S. Geological Survey, Denver. Bottom row, left to right: Jonathan F. Callender, Vice-President, University of New Mexico, Albuquerque; William J. Stone, Chairman, Advertising Committee, N.M. Bureau of Mines & Mineral Resources, Socorro; James E. Fassett, President, U.S. Geological Survey, Farmington; Barry S. Kues, Editor, Fall Field Conference Guidebook, University of New Mexico, Albuquerque; Rodney C. Ewing, Editor, Fall Field Conference Guidebook, University of New Mexico, Albuquerque. Photograph taken at Executive Committee meeting of the New Mexico Geological Society outside Northrop Hall on the University of New Mexico campus in Albuquerque in March 1976.

PRESIDENT'S MESSAGE

Welcome to the New Mexico Geological Society's twenty-seventh consecutive annual fall field conference. This year we have the unique good fortune of participating in the first geologic field trip to penetrate the mysterious hidden recesses of Vermejo Park. This area, starting out as part of a Spanish Land Grant, has been continuously in private ownership and, as such, has never before been open to the general public. Through the good offices of Chuck Pillmore, Road Log Chairman, and the kind indulgence of Pennzoil Corporation, current owner of the property, and Kaiser Steel Corporation, this trip was made possible. As with any field conference, a large number of unselfish workers put in many many hours of their own time to make this trip a success; chief among these were Harold James, General Chairman, and Barry Kues and Rod Ewing, Guidebook Editors, and Helen Hodgson of the U.S. Geological Survey, editorial assistant. Members of all of the other committees that contributed to the smooth operation of this conference are listed in this Guidebook, and I would urge each of you to let each of them know that their work is appreciated. Thanks are also due to Welex and Schlumberger Well Services for their cooperation and assistance, as well as to all of those corporate and private contributors and advertisers who helped to support this venture.

It may surprise many of you to learn that the area of our field conference, the Raton Basin, represents one of the world's richer mineral provinces. A conservative estimate of the amount of coal in place in the basin is on the order of five billion tons. With coking coal selling at from 30 to 40 dollars per ton today, the value of this deposit is between 150 and 200 billion dollars. Even if only one-fourth of this coal is recoverable, the coking coal of the Raton Basin easily represents a 50 billion dollar resource. To place this number in perspective, consider the East Texas oil field, the largest field in the United States (excluding Alaska), with original reserves of around six billion barrels of oil; even at today's high oil prices, it represents a province of less total value than the Raton Basin coal province. Not only that, the Raton Basin also offers snow-capped peaks, elk and deer, teeming trout streams and lakes, and spectacular natural scenery—sorry, East Texas, you lose there, too.

So enjoy this conference, talk to and question the field trip leaders and the Guidebook authors, and help make this field conference what every successful conference ought to be: another round of dialogue at the cutting edge of our fascinating science of geology.

James E. Fassett
President

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PUBLICATIONS OF THE NEW MEXICO GEOLOGICAL SOCIETY 1976

FIELD CONFERENCE GUIDEBOOKS

I. San Juan Basin (covering north and east sides), New Mexico and Colorado, 1950, V. C. Kelley, E. C. Beaumont, and Caswell Silver, eds., 152 p., 40 illus. Spiral bound.

2. San Juan Basin (covering south and west sides), New Mexico and Arizona, 1951, Clay T. Smith and Caswell Silver, eds., 163 p., 71 illus. Spiral bound.
3. Rio Grande Country, central New Mexico, 1952, Ross B. Johnson and Charles B. Read, eds., 126 p., 50 illus. Spiral bound.
4. Southwestern New Mexico, 1953, Frank E. Kottlowski, ed., 153 p., 70 illus. Spiral bound.
5. Southeastern New Mexico, 1954, T. F. Stipp, ed., 209 p., 76 illus. Spiral bound.
6. South-central New Mexico, 1955, J. Paul Fitzsimmons, ed., 193 p., 66 illus. Prepared in cooperation with the Roswell Geological Society
7. Southeastern Sangre de Cristo Mountains, Colorado, 1957, Frank E. Kottlowski and Brewster Baldwin, eds., 258 p., 110 illus. Spiral bound.
8. Southwestern San Juan Mountains, Colorado, 1957, Frank E. Kottlowski and Brewster Baldwin, eds., 258 p., 110 illus. Spiral bound.
9. Black Mesa Basin (northeastern Arizona), 1958, Roger Y. Anderson and John W. Harshbarger, eds., 205 p., 106 illus. Prepared in cooperation with the Arizona Geological Society.
10. West-central New Mexico, 1959, James E. Weir, Jr., and Elmer H. Baltz, eds., 162 p., 91 illus.
11. Rio Chama Country (northern New Mexico) 1960, Edward C. Beaumont and Charles B. Read, eds., 129 p., 35 illus.
12. Albuquerque Country (New Mexico), 1961, Stuart A. Northrop, ed., 199 p., 83 illus.
13. Mogollon Rim Region (east-central Arizona), 1962, Robert H. Weber and H. Wesley Pierce, eds., 175 p., 77 illus. Prepared in cooperation with the Arizona Geological Society.
14. Socorro Region (New Mexico), 1963, Frederick I. Kuellmer, ed., 204 p., 90 illus.
15. Ruidoso Country (New Mexico, 1964, Sidney R. Ash and Leon V. Davis, eds., 195 p., 64 illus.
16. Southwestern New Mexico II, 1965, J. Paul Fitzsimmons and Christina Lochman Balk, eds., 244 p., 73 illus.
17. Taos-Raton-Spanish Peaks Country (New Mexico and Colorado), 1966, Stuart A. Northrop and Charles B. Read, eds., 128 p., 40 illus.
18. Defiance-Zuni-Mt. Taylor Region (Arizona and New Mexico), 1967, Frederick D. Trauger, ed., 228 p., 98 illus.
19. San Juan-San Miguel-La Plata Region (New Mexico and Colorado), 1968, J. W. Shomaker, ed., 212 p. 95 illus.
20. The Border Region (Chihuahua, Mexico and the United States), 1969, D. A. Cordoba, S. A. Wengerd, and J. W. Shomaker, eds., 228 p., 159 illus.
21. Tyrone-Big Hatchet Mountains-Florida Mountains Region (New Mexico), 1970, L. A. Woodward, ed., 176 p., 84 illus.
22. San Luis Basin (Colorado), 1971, H. L. James, ed., 340 p., 226 illus.
23. East-central New Mexico, 1972, Vincent C. Kelley and Frederick D. Trauger, eds., 236 p., 128 illus. Special publication No. 4 included with purchase.
24. Monument Valley (Arizona, Utah, and New Mexico), 1973, H. L. James, ed., 232 p., 160 illus.
25. Ghost Ranch (central-northern New Mexico; Nacimiento, San Pedro, Jemez and Tusas Mountain Ranges), 1974, Charles T. Siemers, Lee A. Woodward and Jonathan F. Callender, eds., 404 p., 273 illus.
26. Las Cruces Country (central-southern New Mexico), 1975, William R. Seager, Russell E. Clemons and Jonathan F. Callender, eds., 376 p., 243 illus.
27. Vermejo Park (northeastern New Mexico), 1976, Rodney C. Ewing and Barry S. Kues, eds.

SPECIAL PUBLICATIONS

1. Bibliography and index of the New Mexico Geological Society Guidebooks, 1950-63; compiled by Sidney R. Ash, 31 P.
2. History of the New Mexico Geological Society, 1947-1968; by Stuart A. Northrop, 78 p.
3. The San Andres Limestone: a reservoir for oil and water (a symposium); F. E. Kottlowski and W. K. Summers, eds , 51 p. 35 illus.
4. Subsurface geology of east-central New Mexico by R. W. Foster, R. M. Frentress, and W. C. Riese, 22 p., 11 figs. (includes 8 isopach maps).
5. Cenozoic volcanism in southwestern New Mexico; Wolfgang E. Elston and Stuart A. Northrop, eds., 151 p., 119 illus.
6. Tectonics and mineral resources of southwestern North America; Lee A. Woodward and Stuart A. Northrop, eds., 218 p., 207 illus.

MAPS

a. Geologic highway map of New Mexico (in color, 23 x 29 in.), compiled by Frank E. Kottlowski and others. Rolled, $3.00; folded.

b. Geologic map of the Sierra County Region, compiled by Vincent C. Kelley, in Guidebook 6.

c. Geologic map of the Albuquerque Country, compiled by Stuart A. Northrop and Arlette Hill; in Guidebook 12.

d. Tectonic map of the Ruidoso-Carrizozo Region, by V. C. Kelley and Tommy B. Thompson; in Guidebook 15.

e. Tectonic map of the Defiance-Zuni-Mt. Taylor Region, by V. C. Kelley; in Guidebook 18.

f. Tectonic map of the Rio Grande Region (in color), compiled by L. A. Woodward and others.

g. Tectonic map of the southern Raton Basin, New Mexico, compiled by L. A. Woodward and D. 0. Snyder; in Guidebook 27.

All publications are available by mail from the New Mexico Bureau of Mines and Mineral Resources, Socorro, NM 87801, (505) 835-5410. Guidebooks, and the geological highway map, are available over the counter at the New Mexico Bureau of Mines and Mineral Resources; the Department of Geology, University of New Mexico; Holman's, Inc. 401 Wyoming Blvd., Albuquerque; the Museum of Northern Arizona, Flagstaff; Pebble Pups Rock Shop, Las Cruces; and Roswell Map and Blueprint Co., 125 East 3rd St., Roswell.

1976 FIELD CONFERENCE SCHEDULE

WEDNESDAY, September 29	REGISTRATION DAY: LAS VEGAS
1:00 p.m.-6:00 p.m.	Lobby: Castaneda Hotel
6:00 p.m.-7:00 p.m.	Lounge: "Happy Hour"
8:00 p.m.-9:30 p.m.	Dining Room: Banquet Dinner
THURSDAY, September 30	FIRST DAY: LAS VEGAS-RATON
6:30 a.m.-8:00 a.m.	Castaneda Dining Room: Breakfast
8:00 a.m.-8:30 a.m.	Highlands Univ. Golf Course: Auto-caravan assembly for trip to Raton via Gallinas Canyon, Mora, La Cueva, Ocate, Wagon Mound and Springer.
	Stops: 6
	Lunch: Picnic enroute—"on you"
6:00 p.m.-7:00 p.m.	Holiday Inn (Raton): Attitude Adjustment Hour (cocktails).
8:00 p.m.-10:00 p.m.	Palace Hotel: Joint N.M.G.S. Executive-Field Conference Committee dinner and meeting.
FRIDAY, October 1	SECOND DAY: RATON
8:00 a.m.-8:30 a.m.	La Mesa Race Track frontage road: Auto-caravan assembly for trip to Vermejo Park (east entrance) via Canadian River Canyon and York Canyon mine.
	Stops: 5
	Lunch: Provided enroute
Sundown	Merrick Lake: Outdoor barbecue-supper.
SATURDAY, October 2	THIRD DAY: RATON
8:00 a.m.-8:30 a.m.	Holiday Inn: Auto-caravan assembly for trip to Vermejo Park (north entrance) via Raton Pass, Trinidad and Purgatoire River.
	Stops: 5
	Lunch: Provided enroute