

New Mexico Geological Society

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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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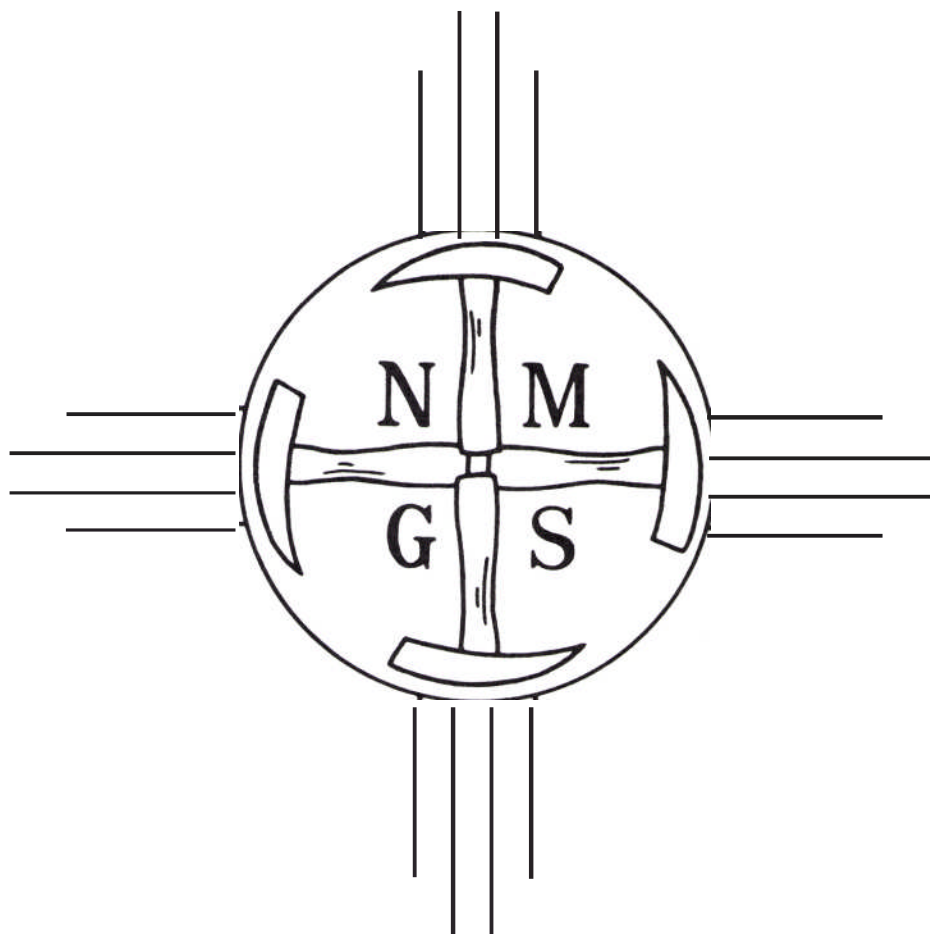
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NEW MEXICO GEOLOGICAL SOCIETY



Guidebook
of the
ALBUQUERQUE COUNTRY

Edited by
Stuart A. Northrop

TWELFTH FIELD CONFERENCE

October 6, 7, and 8, 1961

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PRESIDENT'S MESSAGE

THE BROAD VIEW

— — is important to all geologists, regardless of their status within the science, and regardless of their degree of professional specialization. To provide this view is the distinct privilege of the only non-affiliated Geological Society serving New Mexico. We take this seriously enough to consider it a duty.

The Twelfth Field Conference of the New Mexico Geological Society brings us back from far-flung and comprehensive forays into the far corners of the State—and some adjacent areas—back to the environs of the great population center, Albuquerque. Here, through the efforts of professional and student geologists, a wide variety of geologic, mineralogic, paleontologic, and physiographic information is continually updated and expanded. In every direction, new data add to a better understanding of familiar geologic features and of their interrelated importance.

Under the able guidance of Charles B. Read of the United States Geological Survey, 5th president of the Society, as general chairman of the Conference, and of Stuart A. Northrop of the Geology Department at the University of New Mexico, 3rd president of the Society, as editor of the Guidebook, we will have an authoritative look at a variety of features at the very heart of New Mexico geology. The trip leaders and the guidebook authors are outstanding students of their phases of geologic interest and of their areas of investigation.

To every geologist in New Mexico, and in the surrounding territory, this Conference will be a valuable experience in re-orientation, and the guidebook will be an indispensable addition to his professional library.

The committee's ingenuity in operating this Conference from Albuquerque as a hub, with a return to the city each evening, works to the advantage of all participants. Scheduling on a week end permits more of our friends to whom geology is an avocation to come "rock-hounding" with us. This is an ideal field trip in many respects. We

express our gratitude to the many committee members, authors, and trip leaders whose efforts make it so. Much work was done, also, by members who shared the serious responsibilities of the Society, but whose names do not appear in these formal listings.

These conscientious workers find their reward in your enthusiastic attendance, and your appreciative acceptance and use of the guidebook. They gain, also, in ability and effectiveness in their own field of endeavor through the experience of this cooperative effort. This is the way an effective scientific society works, and this is the reason it is effective.

The members of the executive committee welcome you. We know you will enjoy the comradeship and discussions with friends of mutual interest. We believe you will be inspired by inspection of geologic phenomena from Precambrian to Recent, and from stratigraphic and structural to igneous and mineralized. We hope you will be stimulated by the invigorating climate from warm, low deserts to cool, majestic pine-clad mountains.

Join us, too, next May at our Technical Meeting in Albuquerque. And plan ahead for our next Field Conference. Our delayed plans with the Arizona Geological Society should develop, and will take us into the "Tonto Rim" country from westernmost-central New Mexico into east-central Arizona.



Richard D. Holt, President
New Mexico Geological Society

EXECUTIVE COMMITTEE

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Guidebook Committee

Stuart A. Northrop	Editor	Department of Geology, University of New Mexico
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PUBLICATIONS OF THE NEW MEXICO GEOLOGICAL SOCIETY

1. Guidebook of the San Juan Basin [covering north and east sides], New Mexico and Colorado; First Field Conference, 1950; edited by Vincent C. Kelley and others; 153 pages, 40 illustrations. (Out of print)
2. Guidebook of the south and west sides of the San Juan Basin, New Mexico and Arizona; Second Field Conference, 1951; edited by Clay T. Smith and Caswell Silver; 163 pages, 69 illustrations. (Out of print)
3. Guidebook of the Rio Grande country, central New Mexico; Third Field Conference, 1952; edited by Ross B. Johnson and Charles B. Read; 126 pages, 51 illustrations. (Out of print)
4. Guidebook of southwestern New Mexico; Fourth Field Conference, 1953; edited by Frank E. Kottowski and others; 165 pages, 67 illustrations. \$5.00
5. Guidebook of southeastern New Mexico; Fifth Field Conference, 1954; edited by T. F. Stipp; 213 pages, 83 illustrations. \$5.00
6. Guidebook of south-central New Mexico; Sixth Field Conference, 1955; edited by J. Paul Fitzsimmons; 193 pages, 70 illustrations. Prepared with the cooperation of the Roswell Geological Society. \$7.00 (Only a few copies left)
7. Guidebook of southeastern Sangre de Cristo Mountains, New Mexico (Raton Basin); Seventh Field Conference, 1956; edited by A. Rosenzweig; 154 pages, 61 illustrations. \$7.00
8. Guidebook of southwestern San Juan Mountains, Colorado (Four Corners Area); Eighth Field Conference, 1957; edited by Frank E. Kottowski; 258 pages, 109 illustrations. \$7.00
9. Guidebook of the Black Mesa Basin, northeast Arizona; Ninth Field Conference, 1958; edited

by Roger Y. Anderson and John W. Harshbarger; 205 pages, 105 illustrations, hard binding. Prepared in cooperation with the Arizona Geological Society. \$8.50

10. Guidebook of west-central New Mexico; Tenth Field Conference, 1959; edited by James E. Weir, Jr. and Elmer H. Boltz, Jr.; 162 pages, 83 illustrations, hard binding. \$8.50
11. Guidebook of Rio Chama country [New Mexico and Colorado]; Eleventh Field Conference, 1960; edited by Edward C. Beaumont and Charles B. Read; 129 pages, 35 illustrations, hard binding. \$8.50
12. Guidebook of the Albuquerque country [New Mexico]; Twelfth Field Conference; edited by Stuart A. Northrop; hard binding. \$9.50.

These publications are available by mail (please add 25¢ for handling and postage) from the New Mexico Bureau of Mines and Mineral Resources, Campus Station, Socorro, New Mexico. Also over-the-counter sales at either the Bureau of Mines or the Department of Geology, University of New Mexico, Albuquerque. Checks should be made payable to the New Mexico Geological Society. Geologic maps accompanying certain guidebooks are available by mail or over the counter at the Bureau of Mines, Socorro, as follows:

- (a) Geologic map of the Sierra County region, New Mexico; compiled by Vincent C. Kelley; accompanies Guidebook of the Sixth Field Conference. \$1.00
- (b) Geologic map of the Rio Chama country; compiled by Clay T. Smith and William R. Muehlberger; accompanies Guidebook of the Eleventh Field Conference. \$0.50
- (c) Geologic map of the Albuquerque country; compiled by Stuart A. Northrop and Arlette Hill; accompanies Guidebook of the Twelfth Field Conference. \$1.00

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SCHEDULE

Thursday, October 5
5:00- 10:00 p.m.

Registration, New Mexico Union, University of New Mexico Campus, Albuquerque, New Mexico.

Friday, October 6
7:30 a.m.

Caravan assembles on East Central (U. S. 66-East) at Juan Tabo Road.

Saturday, October 7
7:30 a.m.

Caravan assembles on West Central (U. S. 66-West), 3 miles west of Rio Grande bridge.

Sunday, October 8
7:30 a.m.

Caravan assembles on San Mateo Blvd., N.E., at Montgomery Road.

Field Conference ends near Santa Fe.

A FEW WORDS FROM THE EDITOR

A glance at the accompanying geologic map (in pocket) will reveal that Albuquerque is not at the geographic center of the map-area. One of the chief reasons for this is that the U. S. Geological Survey's revised map of the northeastern quarter of the State has not yet been published. The map from which the Guidebook map was compiled is Dane and Bachman's (1957) "Preliminary geologic map of the northwestern part of New Mexico" (U. S. Geol. Survey Misc. Geol. Inv. Map 1-224), which distinguishes more than 78 stratigraphic units. It seemed to some of us that a map designed for use on a field conference, in conjunction with a road log, should be kept as simple as possible. Thus, the Guidebook map employs only 10 stratigraphic units. (In the planning stages, we referred to our map as a "60-mile-an-hour map.")

It has not been possible to cover all aspects of the geology of the Albuquerque country in this Guidebook. The Guidebook does not pretend to be a compendium of all that is known of the geology of the area. Many significant facets are described in one or more chapters, but several short articles might have been prepared to deal with certain other aspects. The geologic literature is voluminous and many important published papers are neither cited in the text nor even included in the several lists of references. At one time we thought of compiling a complete bibliography—a sort of master bibliography—for the Guidebook, but this would have entailed so much repetition that we abandoned the idea.

Geographic Names.—Map-makers seem to delight in changing geographic names in the Southwest. Note the following changes in names of certain features in the area on U. S. G. S. maps from 1928 to 1960.

Darton's Geologic Map (1928)

Ladron Pk
Mesa Chivato
Nacimiento Mts
San Pedro Mtn
(near Cuba)
San Pedro Mts
(near Golden)
Valle Mts

New Mexico Base Map (1960)

Ladron Mts
Cebolleta Mts
Sierra Nacimiento
San Pedro Mountains
[error]
[not named]
Jemez Mountains

The Ladron Mountains, just south of the south edge of the Guidebook map, have also been referred to as Sierra Ladron and Sierra Ladrones. The Jemez Mountains have been called the Sierra de los Valles; the latter term is properly applied to only a part of the mountains surmounting the Jemez Plateau. The great depression at the summit of the Jemez Plateau has been called Jemez crater, Jemez caldera, Valles crater, Valles caldera, and is often referred to by many local people as the Valle Grande. Actually, Valle Grande is simply one of several valleys occupying the caldera, as pointed out by Ross, Smith, and Bailey in their article in the Guidebook.

Editorial Policy.—Editorial policies and practices change continually. In some of the Society's guidebooks, the editors have given contributors a free hand, especially in the format of citing references. In view of the commendable attempts in recent years to standardize the order of citation in bibliographic lists (see "Suggestions to authors of the reports of the U. S. Geological Survey," 5th ed., p. 107) and also to standardize the abbreviations used in citations (ibid., p. 111-118), your editor has made a valiant attempt to achieve some degree of uniformity in this Guidebook. He apologizes to certain authors for making extensive alterations in format, especially in their lists of references. Practically every reference has been checked for the name of the author, the date, the title, the source (periodical, series, etc.), the volume number, and pages. The bibliographies are thus believed to be relatively free of errors.

Incidentally, the editor has not followed Geological Survey style in every particular. For example, he prefers "New Mexico" to the Survey's familiar abbreviation "N. Mex." He does not care for the Survey's use of "N. Mex. Univ.", but prefers "Univ. New Mexico" (partly because the institution near Las Cruces now calls itself "New Mexico State University"). He has generally shortened "New Mexico Institute of Mining and Technology State Bureau of Mines and Mineral Resources" to "New Mexico Bur. Mines and Mineral Res." The editor has a distinct aversion to the recently adopted capitalization of stratigraphic terms, such as system, group, and formation, in "Permian System," "Santa Fe Group," "Madera Limestone." Again, the editor sees no necessity for the hyphen in such color terms as "light gray" or "reddish brown" when used as modifiers before the noun. On the other hand, he has retained the hyphen in such terms as "olive-green" and "chocolate-brown." (The reader will find some inconsistencies in hyphening of color terms between chapters edited early and those edited late.) Writers have been allowed individual preference in some cases; some prefer "Abo Pass" and others, "Abo pass;" some prefer "Sandia Crest" and others, "Sandia crest." Some prefer "aligned" and others, "alined."

The Geological Survey has long frowned on citation of theses and dissertations on the grounds that "unpublished theses generally are not conveniently available." However, such material is now becoming available in microfilm form. In this Guidebook frequent citation of unpublished theses is made. We believe that such a great storehouse of information should not go unmentioned.

Every paper submitted for the Guidebook has been read by Charles B. Read, and the editor has profited greatly by his long experience with field conferences and guidebooks.

Stuart A. Northrop

PHYSIOGRAPHIC SETTING

According to the well-known Fenneman map, "Physical Divisions of the United States" (U. S. Geol. Survey, 1930), within a radius of 90 miles of Albuquerque there are three major physiographic divisions, four provinces, and seven sections, as follows:

INTERIOR PLAINS major division

Great Plains province

Raton section (13g)

Pecos Valley section (13h)

ROCKY MOUNTAIN SYSTEM major division

Southern Rocky Mountains province (16)

(not subdivided into sections)

INTERMONTANE PLATEAUS major division

Colorado Plateaus province

Navajo section (21d)

Datil section (21f)

Basin and Range province

Mexican Highland section (22d)

Sacramento section (22e)

Characteristics of the sections are as follows:

Raton section: trenched peneplain surmounted by dissected lava-capped plateaus and buttes.

Pecos Valley section: late mature to old plain.

Southern Rocky Mountains province: complex mountains of various types; intermont basins.

Navajo section: young plateaus; smaller relief than the Canyon Lands section (21c) of Colorado and Utah.

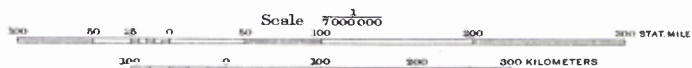
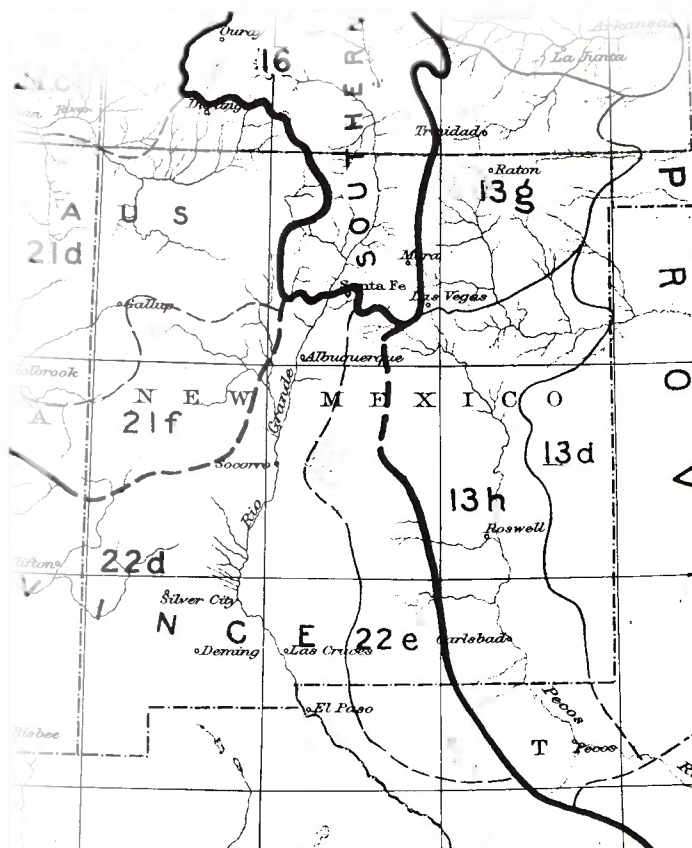
Datil section: lava flows entire or in remnants; volcanic necks.

Mexican Highland section: isolated ranges (largely dissected block mountains) separated by aggraded desert plains.

Sacramento section: mature block mountains of gently tilted strata; block plateaus; bolsons.

The only section well represented in the State that does not approach to within 90 miles of Albuquerque is the High Plains (13d), about 150 miles east of Albuquerque. The Canyon Lands section (21c) barely enters the State at the northwest corner; this is about 175 miles from Albuquerque.

Note that the Rocky Mountains terminate between Santa Fe and Las Vegas, despite a National Geographic Society map that shows them extending clear across New Mexico and terminating in West Texas. (It is reliably reported that the reason for this was that the Society had many members residing in Texas who liked to think that their State included a bit of the Rockies! These people still invade New Mexico and Colorado to fish.) Of course, it all depends on the point of view. Structurally, the Sandia-Manzano Range may partake of some of the characteristics of the Southern Rocky Mountains province, but Fenneman's classification stresses physiography, and the Rio Grande depression, the Sandia-Manzano Range, and the Estancia bolson certainly resemble Basin and Range physiography—with "isolated ranges (largely dissected block mountains) separated by aggraded desert plains."



Physiographic divisions of New Mexico.
Adapted from Fenneman (1930).

