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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 1964 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.

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.

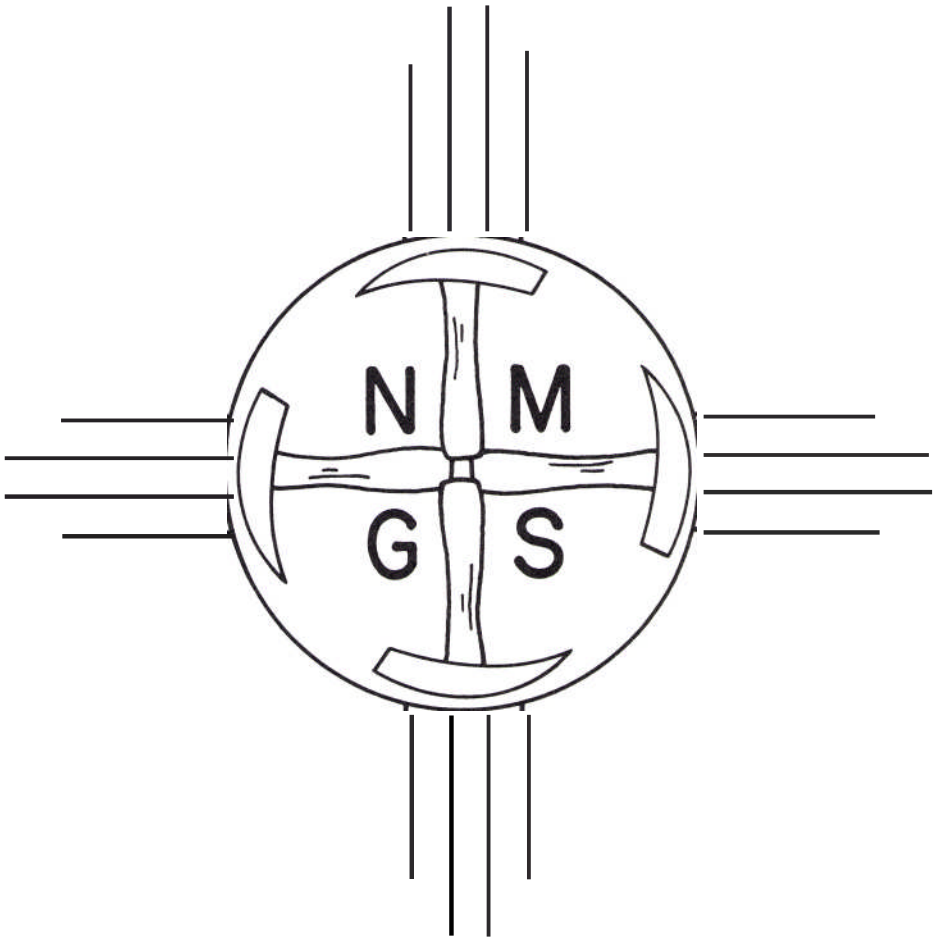
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NEW MEXICO GEOLOGICAL SOCIETY



Guidebook

of the

RUIDOSO COUNTRY

Edited by

Sidney R. Ash and Leon V. Davis

FIFTEENTH FIELD CONFERENCE

October 16, 17 and 18, 1964

RUIDOSO COUNTRY FORMATIONS

See Lexicon on p. 57 of this guidebook for more detailed description

SYSTEM	STRATIGRAPHIC UNIT	PHYSICAL CHARACTER
QUATERNARY	LITTLE BLACK PEAK BASALT FLOW	Olivine basalt.
	BROKEN BACK BASALT FLOW	Olivine basalt.
TERTIARY	SIERRA BLANCA VOLCANICS	Andesite flow breccia, tuffs, volcanic conglomerate.
	LONE MOUNTAIN STOCK	Nordmarkite.
	JICARILLA MONZONITE	Monzonite porphyry.
	McRAE FORMATION or CUB MOUNTAIN FORMATION of Bodine (1956)	Sandstone, chert pebble conglomerate, shale.
CRETACEOUS	MESAVERDE GROUP or MESAVERDE FORMATION	Sandstone, shale, coal, marl, lignite.
	MANCOS SHALE	Shale, limestone, sandstone.
	DAKOTA SANDSTONE	Sandstone, shale, siltstone.
TRIASSIC	CHINLE FORMATION	Shale, shaly sandstone.
	SANTA ROSA SANDSTONE	Sandstone, chert pebble conglomerate.
	ARTESIA GROUP, ARTESIA FORMATION, BERNAL FORMATION, CHALK BLUFF FORMATION, or WHITEHORSE GROUP	Gypsum, anhydrite, dolomite, impure limestone, siltstone, shale, sandstone.
	SAN ANDRES LIMESTONE	Limestone, dolomite, siltstone, sandstone, gypsum, anhydrite, shale.
PERMIAN	GLORIHTA SANDSTONE, or HONDO SANDSTONE MEMBER OF SAN ANDRES FORMATION	Sandstone, silty limestone, siltstone, gypsum, anhydrite.
	YESO FORMATION	Siltstone, limestone, shale, sandstone, gypsum, salt, anhydrite.
	ABO FORMATION	Sandstone, shale, conglomerate.
	BURSUM FORMATION or LABORCITA FORMATION	Limestone, shale, conglomerate.
PENNSYLVANIAN	MAGDALENA GROUP, MADERA LIMESTONE, SANDIA FORMATION	Limestone, shale, sandstone conglomerate.
PRECAMBRIAN	-	Granite, quartzite.

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Geologic map of the Little Black Peak Quadrangle, Socorro and Lincoln Counties, New Mexico; by Clay T. Smith

Tectonic map of the Ruidoso-Carrizozo region; compiled by V. C. Kelley and Tommy B. Thompson

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Folded laminae (X5) of bituminous calcite and anhydrite from the lower part of the Permian Castile Formation of Texas and southeastern New Mexico. According to R. Y. Anderson and D. W. Kirkland of the University of New Mexico, the folds were probably formed by gravitational adjustment on the original slope of the basin. Photograph by D. W. Kirkland.

PRESIDENT'S MESSAGE

Welcome to the Ruidoso country and the Fifteenth Annual Field Conference of the New Mexico Geological Society.

Those of us who have been spoiled by extensive outcrops in barren desert mountains now will appreciate the problems of the tree-dodging geologists who work in these higher elevations of more humid climates. You will see some of the better exposures in the road cuts along the highways of the conference route. Sometime just try to follow the rock units back into the forested areas!

In keeping with the Society's policy to serve the entire spectrum of geology, workers in various fields have been asked to contribute to the trip as leaders and as authors of guidebook articles. Each bit of field evidence that we can digest will make us all better geologists. Increase your background knowledge by reading the articles, and please give your attention to the leaders at the discussions. They will welcome your pertinent questions.

As many of you know the organization, preparation, and execution of such a conference is an enormous task. This year, as in the past, the bulk of the load has fallen on the General Chairman, Walter A. Mourant, and the Guidebook Editors, Leon V. Davis and Sidney R. Ash. Special mention should be made of the Road Log Committee Chairman, Carl Ulvog, who spent several months logging the many miles of roads in this region. On behalf of the Society, I wish to thank them and the other chairman and committee workers for their assistance. They have all given unstintingly of their time and efforts to make the trip a success. I hope that each participant will personally tell the leaders, authors, and workers involved how beneficial the conference was to you. Suggest improvements; we aim to please!

Fortunately our Society field trip month, October, falls between the time when the roads in the Ruidoso area are packed with turf fans during the racing season, and the time when they are packed with snow during the skiing season. Only in recent years have the accommodations in this growing resort community beensufficient to support a large conference. *Ruidoso,* Spanish for "noisy," was meant to describe the rushing currents of the Rio Ruidoso. But wait until rock hounds start banging away!

Don't miss the ride on the new gondola tramway to the observation point near Sierra Blanca Peak on the first day of the conference. (If it's a clear day, and with the aid of a time machine, you may be able to see Dr. Clay T. Smith lecturing atop Socorro Peak at last year's conference.) After this regional survey, we shall descend to highway level and be on our way to see as much geology around the Tularosa-Carrizozo-Hondo triangle as we can in one week-end.

Recalling his famous voyage around the world on the *Beagle* from 1831-1836, Charles Darwin wrote:

> "The investigation of the geology of all the places visited was far more important, as reasoning here comes into play. On first examining a new district nothing can appear more hopeless than the chaos of rocks; but by recording the stratification and nature of the rocks and fossils at many points, always reasoning and predicting what will be found elsewhere, light soon begins to dawn on the district and the structure of the whole becomes more or less intelligible . . .

Isn't this gem of wisdom applicable in our day and age? Consider it while you are observing the screwed-up mess in the Lincoln fold belt.

One last request — upon your return home let others in your companies and agencies know that a field trip can be informative as well as enjoyable.

Thanks for your interest in our Society. I am looking forward to our meeting on the outcrop.

Sam Thompson III

President, New Mexico Geological Society, 1964-65

EXECUTIVE COMMITTEE

Sam Thompson, III*	President	Humble Oil and Refining Co.
A. J. Budding	President	New Mexico Bureau of Mines and Mineral Resources
	Vice-President	
Fred D. Trauger	Secretary	U.S. Geological Survey, Water Resources Division
James L. Albright Wolfgang	Treasurer	Pubco Petroleum Corp.
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FIELD CONFERENCE COMMITTEES

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Sidney R. Ash	Co-Editor	U.S. Geological Survey, Ground Water Branch
Leon V. Davis	Co-Editor	U.S. Geological Survey, Paleontology and Stratigraphy Branch

Road Logging Committee

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Leroy Corbitt		Sunray DX Oil Co.
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A. J. Budding		New Mexico Bureau of Mines and Mineral Resources
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Finance Committee

James L. Albright		Pubco Petroleum Corp.

*Mr. Thompson resigned on August 17, 1964 to accept an assignment with International Petroleum Company, Ltd. in Bogota, Colombia.

PUBLICATIONS OF THE NEW MEXICO GEOLOGICAL SOCIETY

GUIDEBOOKS

1. Guidebook of the San Juan Basin [covering the north and east sides], New Mexico and Colorado; First Field Conference, 1950; edited by Vincent C. Kelley and others; 152 + ii 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 + iv pages, 71 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 + iii pages, 50 illustrations. (Out of print)
4. Guidebook of southwestern New Mexico; Fourth Field Conference, 1953; edited by Frank E. Kottlowski and others; 153 + v pages, 70 illustrations. $5.00
5. Guidebook of southeastern New Mexico; Fifth Field Conference, 1954; edited by T. F. Stipp; 209 + viii pages, 76 illustration. $5.00
6. Guidebook of south-central New Mexico; Sixth Field Conference, 1955; edited by J. Paul Fitzsimmons; 193 + vii pages, 66 illustrations, hard binding. Prepared with the copperation of the Roswell Geological Society. (out of print)
7. Guidebook of southeastern Sangre de Cristo Mountains, New Mexico; Seventh Field Conference, 1956; edited by A. Rosenweig; 151 + iii pages, 61 illustrations. $7.00
8. Guidebook of southwestern San Juan Mountains, Colorado; Eighth Field Conference, 1957; edited by Frank E. Kottlowski and Brewster Baldwin; 258 + vi pages, 110 illustrations. $7.00
9. Guidebook of the Black Mesa Basin, northeastern Arizona; Ninth Field Conference, 1958; edited by Roger Y. Anderson and John W. Harshbarger; 205 + vii pages, 106 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. Baltz; 162 + iv pages, 91 illustrations; hard binding. $8.50
11. Guidebook of the Rio Chama country [New Mexico and Colorado]; Eleventh Field Conference, 1960; edited by Edward C. Beaumont and Charles B. Read; 129 + vii pages, 35 illustrations, hard binding. $8.50
12. Guidebook of the Albuquerque country [New Mexico]; Twelfth Field Conference, 1961, edited by Stuart A. Northrop; 199 + viii pages, 83 illustrations, hard binding. $9.50
13. Guidebook of the Mogollon Rim region, east-central Arizona; Thirteenth Field Conference, 1962; edited by Robert H. Weber and H. Wesley Pierce; 175 + xi pages, 77 illustrations, hard binding. Prepared with the copperation of the Arizona Geological Society. $9.50
14. Guidebook of the Socorro region, New Mexico; Fourteenth Field Conference, 1963; edited by Frederick J. Kuellmer; 240 + ix pages, 90 illustrations, hard binding. $9.00
15. Guidebook of the Ruidoso country [New Mexico]; Fifteenth Field Conference, 1964, edited by Sidney R. Ash and Leon V. Davis, hard binding. $9.00

These publications are available by mail (please add 25 cents for postage and handling) from the New Mexico Bureau of Mines and Mineral Resources, Campus Station, Socorro, New Mexico. Also over-the-counter sales at the New Mexico Bureau of Mines and Mineral Resources, Socorro; the Department of Geology, University of New Mexico, Albuquerque; Holman's Book Store, Albuquerque, N. Mex.; and Museum of Northern Arizona, Flagstaff. Checks should be made payable to the New Mexico Geological Society. Discounts of 20 percent are available on all guidebooks except Nos. 12, 13, 14, and 15 to members of New Mexico Geological Society and to non-members who purchase one set or more. Dealer's discounts are available on all publications by request.

SPECIAL PUBLICATIONS

1. Bibliography and index of the New Mexico Geological Society Guidebooks, 1950-1963; compiled by Sidney R. Ash. In press.
2. A history of the New Mexico Geological Society; by Stuart A. Northrop. In preparation.

MAPS

Geological maps are available by mail or over the counter from the New Mexico Bureau of Mines and Mineral Resources, Socorro, as follows:

(a) Geologic highway map of New Mexico; compiled by Frank E. Kottlowski and others. $1.25 folded; $1.50 rolled. Also available from the Department of Geology, University of New Mexico, and Holman's Book Store, Albuquerque; and Roswell Map ompany, Roswell.

(b) Geologic map of the Sierra County Region, New Mexico; compiled by Vincent C. Kelley; accompanies Guidebook of the Sixth Field Conference, $1.00.

(c) 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

(d) Geologic map of the Albuquerque country; compiled by Stuart A. Northrop and Arlette Hill; accompanies Guidebook of the Twelfth Field Conference. $0.50.

(e) Tectonic map of the Ruidoso-Carrizozo region; compiled by V. C. Kelley and Tommy B. Thompson; accompanies Guidebook of the Fifteenth Field Conference. $1.00.

ROAD LOGS

Entry and exit road logs to supplement Guidebook of the Ninth Field Conference. $0.10 each. The Road Logs are available by mail or over the counter from the New Mexico Bureau of Bureau of Mines and Mineral Resources, Socorro, as follows:

(a) Albuquerque to Gallup (N.M.) and return, by E. H. Baltz, Jr. and S. W. West.

(b) Mountainair to Correo (N.M.) and return, by Frank B. Titus, Jr.

(c) Gallup (N.M.) to Cortez (Colo.) and return, by K. G. Smith, W. D. Fenex, et al.

(d) Socorro (N.M.) to Holbrook (Ariz.) and return, by S. Thompson III and 0. C. Hutson.

(e) Globe to Showlow and to Sanders (Ariz.) and return, by J. P. Akers and H. W. Pierce.

(f) Monticello (Utah) to Tuba City (Ariz.) and return, by T. L. Britt, E. L. Howard, and W. F. Auer.

(g) Kingman via Grand Canyon Junction to Flagstaff (Ariz.) and return, by W. L. Chenoweth, D. R. Dow, and C. H. Williams.

(h) Flagstaff to Prescott (Ariz.) and return, by D. G. Metzger and F. R. Twenter.

(i) Gap Trading Post (Ariz.) to Kanab (Utah) and return, by J. P. Akers.

Schedule

Thursday, October 15
5:00 - 10:00 p.m.

Registration at the Chaparral Motor Hotel, Ruidoso Downs, New Mexico.

Friday, October 16

Conferees will assemble on the top of Lookout Mountain near the upper terminal of the Gondola Lift at 10:00 a.m. Note: It is a 25 mile drive from the Chaparral to the Sierra Blanca Ski Lodge Headquarters where the lower terminal of the gondola lift is located (traveling time of about 45 minutes) and the lift (15 minute trip) starts operating at 9:00 a.m. Plan Ahead!

Lunch — conferees will make their own arrangements for lunch today. Dining facilities are available in Ruidoso, Ruidoso Downs, and at Ski Lodge Headquarters.

The Caravan will assemble and leave from the Chaparral Motor Hotel at 1:00 p.m. Please be prompt.

Saturday, October 17

The Caravan will assemble in the valley of the Rio Bonito, 81/2 miles northwest of Lincoln, New Mexico at 8:30 a.m. Please be prompt. The assembly point is about 38 miles from the Chaparral (traveling time of about 1 hour).

Lunch __ conferees will make their own arrangements for lunch today in Capitan after visiting the Capitan Iron Deposits. Following lunch the caravan will assemble on N.M. 48 on the southern outskirts of Capitan.

Cocktail hour and banquet will be at the Chaparral; time to be announced.

Sunday, October 18

The Caravan will assemble at Indian Divide, on U.S. 380, about 61/2 miles northwest of Capitan, New Mexico and leave promptly at 8:30 a.m. The assembly point is about 35 miles from the Chaparral (traveling time of about 1 hour).

Lunch — conferees will bring their own lunches with them today. Box lunches are available at the Chaparral and other restaurants in the Ruidoso area.

PHYSIOGRAPHIC SETTING

The southeastern quarter of New Mexico and immediately adjacent areas include parts of the physiographic divisions, provinces and sections enumerated below. These are based on the Fenneman classification (1930).

INTERIOR PLAINS division
- Great Plains province (13)
  - High Plains section (13d)
  - Raton section (13g)
  - Pecos Valley section (13h)
    - Edwards Plateau section (13i)
  - Central Texas section (13k)

ROCKY MOUNTAIN SYSTEM division
- Southern Rock Mountains province (16)

INTERMONTANE PLATEAUS division
- Colorado Plateau section (21)
  - Datil section (21f)
- Basin and Range province (22)
  - Mexican Highland section (22d)
  - Sacramento section (22e)

Characteristics of the sections are as follows: "High Plains section: Broad intervalley remnants of smooth fluviatile plains.

Raton section: Trenched peneplain surmounted by disected, lava-capped plateaus and buttes.

Pecos Valley section: Late mature to old plain.

Edwards Plateau section: Young plateau with mature margin of moderate to strong relief.

Central Texas section: Plateau in maturity and later stages of erosion.

Southern Rock Mountains province: Complex mountains of various types; intermont basins.

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." (Fenneman, 1930) .

The general locations and boundaries of these are graphically shown on the sketch map.

Although the areas to be examined during the conference are only a small part of that included in the map, the initial stop will be a vantage point on Lookout Mountain. From there a spectacular view extends for scores of miles in all directions. A lecture on the regional geology at this point will include remarks on most of the physiographic provinces and sections shown on the map and listed above.

The immediate area of the conference is mainly in the Sacramento section of the Basin and Range province. However, excursions will travel as far east as the western margin of the Pecos Valley section of the Great Plains (at the junction of Rio Bonito and Rio Ruidoso) and into the margin of the Mexican Highlands section of the Basin and Range province on the west.

The thriving village of Ruidoso is in the eastern foothills of the great Sierra Blanca volcanic pile that rises above the Sacramento Mountains to the south. An intrusive body of major size, the Capitan Mountains, lies northeast of the Sierra Blanca. The highest pointon this mass rises almost 3,500 feet to an elevation of 10,230 feet above the adjacent uplands.

The route of the caravan on the first day of the trip is first southwestward and traverses the north plunging front of the Sacramento Mountains into the Tularosa Basin, a bolson in the Mexican Highlands section of the Basin and Range province. A stop will be made in the vicinity of Carrizozo to examine the land forms that constitute the surface of The Malpais, a Recent lava flow. During the remainder of the first day the route crosses the northern and eastern flanks of the Sierra Blanca volcanic pile.

The entire second day will be spent on the back slope of the Sacramento Mountains. Many interesting karst features, developed in both the San Andres Limestone and the Yeso Formation, will be seen along the route. Visible also are two high erosional surfaces, the Sacramento plain and the Diamond A plain.

The Sacramento plain is the uppermost of these surfaces and is essentially the dissected back slope of the Sacramento Mountains eastward from the crest in the vicinity of Cloudcroft. It is believed to be correlative either with the surface of the High Plains (Mescalero) or with the pre-Ogalalla surface.

The Diamond A plain, in the eastern part of the Sacramento backslope, is approximately 250 feet below the Sacramento surface. These two surfaces appear to merge to the west as the Sacramento escarpment is approached.

On the third and final day of the conference, the route traverses the Jicarillo Mountains, a group of physiographic domes that are the results of intrusion of igneous materials. This area resembles both geomorphically and structurally the classic Little Rocky Mountains of east-central Montana.

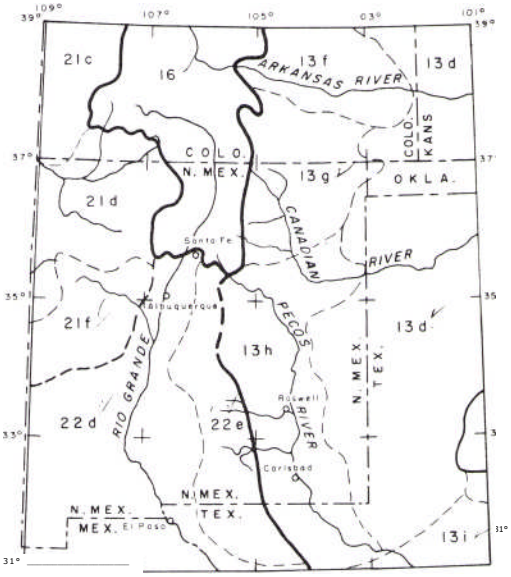
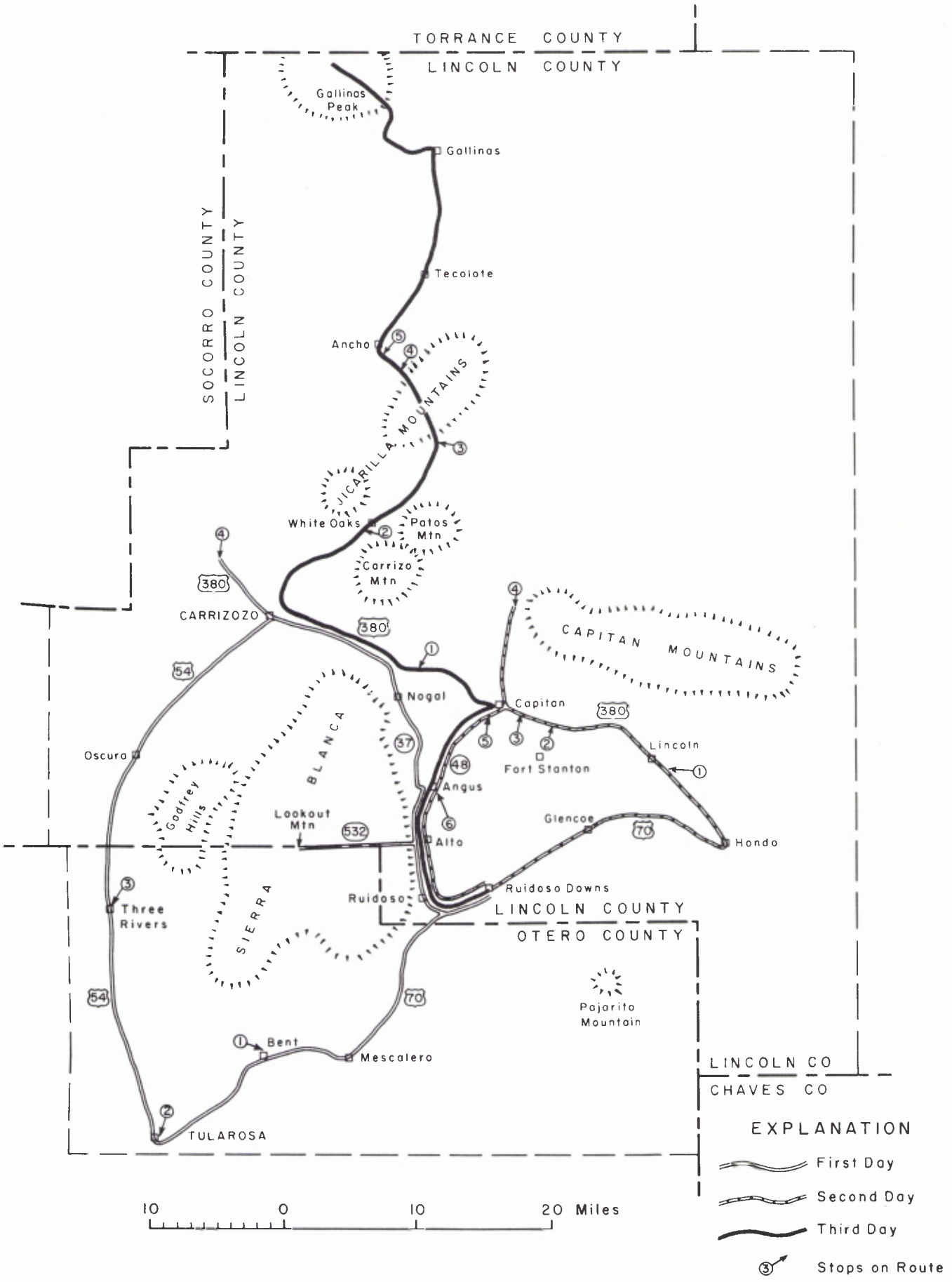


Figure 1. — Physiographic divisions of southeastern New Mexico and adjacent areas (Adapted from Fenneman, 1930).



Map showing route of 15 th field conference