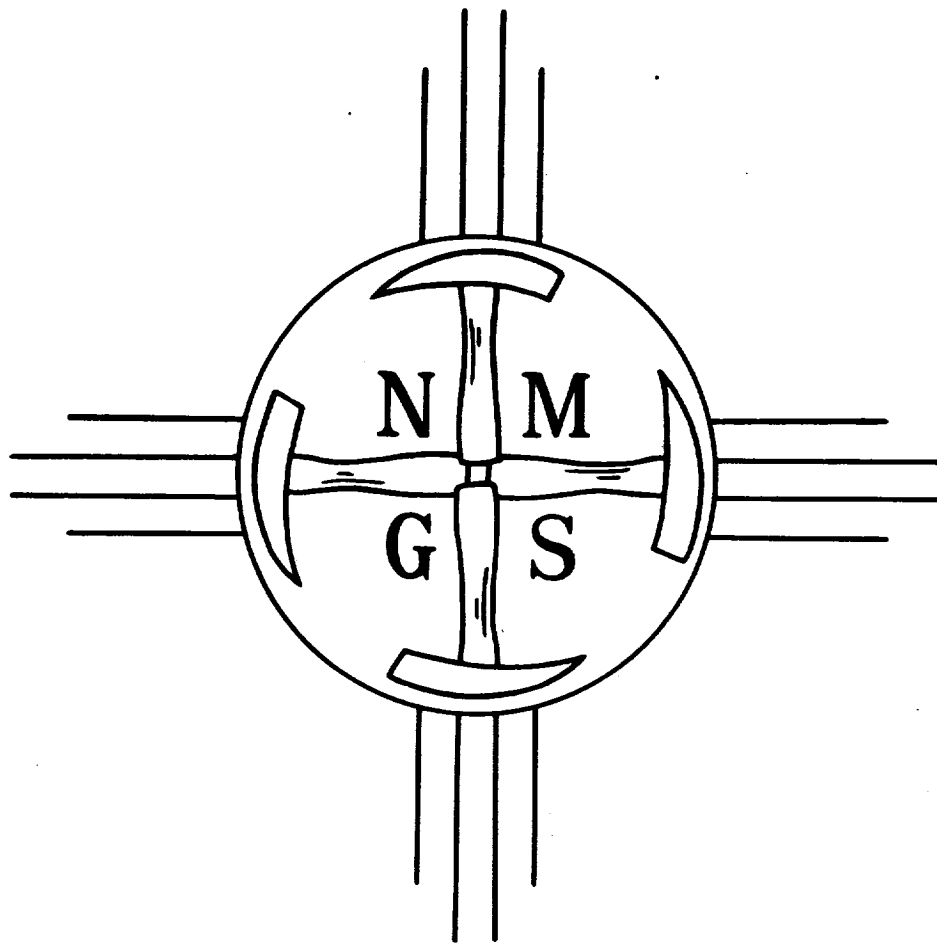


# NEW MEXICO GEOLOGICAL SOCIETY



**Guidebook**

OF

SOUTHWESTERN

NEW MEXICO

**FOURTH FIELD CONFERENCE**

October 15-16-17 & 18, 1953

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**FOREWARD**

The New Mexico Geological Society welcomes you to its Fourth Field Conference. We have enjoyed your participation in the first and second conference, which were along the margins of the San Juan Basin. Last year we lured you down the Rio Grande Valley, to view the mountain backbone of New Mexico. This year we wish you to examine the southern part of the Rio Grande Valley, and then to plunge into the rugged mountains and wide plains of the Basin and Range section of southwestern New Mexico. This portion of the state is a challenge to the petroleum geologist, the stratigrapher, the vulcanologist, and the mining geologist. The trip will take you through rich valleys, over timbered mountains, and across broad plains, with a maximum variety of geology and scenery. We hope you will enjoy your trip, and will find the geology both interesting and stimulating. We invite you to participate actively in the discussions at the various stops, and we shall appreciate your comments and criticisms.

**OFFICERS OF THE SOCIETY**

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**ACKNOWLEDGEMENTS**

The Society this year requested the New Mexico Bureau of Mines and Mineral Resources to be responsible for the preparation and editing of the guidebook. Extensive field mapping and various geologic studies, combined with liberal excerpts from unpublished reports of the Bureau, were required to produce many of the maps and much of the text. The cooperation of the Mineral Deposits Branch of the U. S. Geological Survey was secured and Mr. W. R. Jones of the Survey obtained and prepared the material covering the Silver City area. The Society is grateful, not only to the personnel of these two organizations, but to the many others who have supplied articles and materials for the guidebook or who have made the arrangements necessary to conduct the conference. All are listed in the index. The Society is particularly indebted to the members, individuals, companies, and advertisers who in so many ways are attempting to make the success of this conference equal that of its predecessors.

**CONFERENCE COMMITTEE**

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**Advisory**

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Marian R. Burks, Assembling ..... New Mexico Bureau of Mines  
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William R. Jones, Silver City arrangements ..... U. S. Geological Survey  
William A. Sandeen, Meals ..... Standard Oil Company of Texas  
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SCHEDULE

Thursday, October 15, El Paso, Texas and vicinity.

- 9:00 a.m. Registration. Cortez Hotel, El Paso, Texas
1:00 p.m. Caravan assembles at McKelligon Canyon.
1:15 p.m. Caravan leaves assembly spot.
5:00 p.m. Caravan returns to El Paso.

Friday, October 16. Las Cruces to Silver City, New Mexico.

- 8:30 a.m. Caravan assembles on northwest side (U. S. 85) of Las Cruces, New Mexico.
9:00 a.m. Caravan leaves Las Cruces, New Mexico.
5:30 p.m. Caravan arrives Silver City, New Mexico.
7:00 p.m. Late registration, Murray Hotel, Silver City.

Saturday, October 17. Santa Rita and White Signal districts, New Mexico.

- 7:30 a.m. Caravan assembles on north side of Silver City, at intersection of Pope and Twelfth Streets.
8:00 a.m. Caravan leaves Silver City for Santa Rita area.
12:00 noon Caravan returns to Silver City for lunch.
1:00 p.m. Caravan assembles at mileage 1.1 south of Silver City
1:30 p.m. Caravan leaves for Tyrone and White Signal district.
5:00 p.m. Caravan returns to Silver City.
7:00 p.m. Banquet, Murray Hotel.
9:00 p.m. Smoker, Murray Hotel.

Sunday, October 18. Silver City, New Mexico to Dos Cabezas, Arizona.

- 7:30 a.m. Caravan assembles at mileage 1.1 south of Silver City
8:00 a.m. Caravan leaves Silver City.
3:30 p.m. Caravan disbands near Dos Cabezas, Arizona.

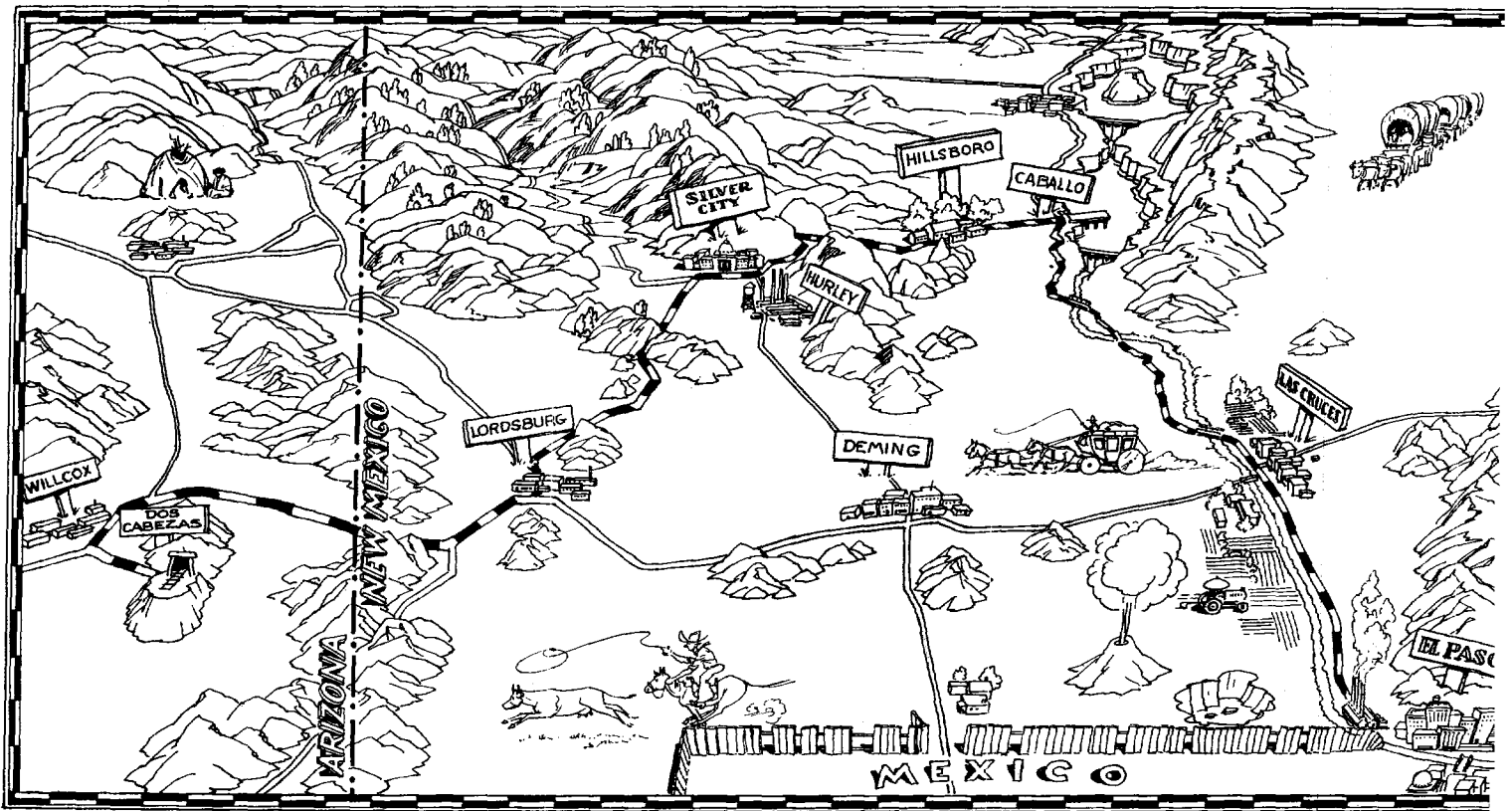
Conference Ends.

### GENERAL INSTRUCTIONS

1. It is essential that the caravan start each morning at the announced time. Your cooperation will be appreciated.
2. You will be seated in a different car each day (except drivers). Your car assignments are listed on the slips which give your room assignments and your total charges for the trip. If you wish to ride in some special car, please notify some member of the Arrangements Committee the night before you make the change.
3. You will be assigned to your lodging reservations at the time of registration. Please do not make any subsequent change of room without notifying some member of the Arrangements Committee.
4. Please pay your lodging bill in advance or before you go to breakfast so you will not delay the departure time of the caravan.
5. There will be several pick-up trucks in the caravan and if you have luggage which will not fit in the car in which you are riding notify a member of the Arrangements Committee and you will be provided with space for your luggage in some car in the caravan.
6. The person sitting in the front seat with the driver will keep him informed of stops, points of danger, points of interest, etc., noted in the road log, and he should read the geologic road log to the driver.
7. Limited parking and turning space on Saturday's trip necessitate taking as few cars as possible. Please arrange to fill every car in the caravan.

### SPECIAL INSTRUCTIONS TO CAR DRIVERS

1. DO NOT DISREGARD THE WARNINGS IN THE ROAD LOGS CONCERNING ROAD CONDITIONS; THEY ARE FOR YOUR PROTECTION.
2. You will be given a numbered placard for attachment to your rear window. This number designates your position in the caravan.
3. If for any reason you have dropped out of line, you may resume your position at any subsequent stop. A space will be left for you by the driver in your rear at all stops until you return.
4. Never pass another Conference car while the caravan is in motion unless that car has dropped out of line.
5. If you have car trouble, please stop at the side of the road and allow the caravan to pass. If you need help, flag down the tow-car which will be at the rear of the caravan.
6. Please service your car at night to insure prompt departure the following morning.
7. Water is very scarce and if your car has a tendency to overheat, you should carry water.
8. At stops when parking in more than one line, drive as close as possible to the adjacent line and leave as little space as possible (one foot or less) between bumpers.



## INTRODUCTION

by

Frank E. Kottowski

Southwestern New Mexico is a land of contrast. From the cool, timbered heights of the Black Range and Mogollon Plateau the traveler may view dune-covered creosote plains of La Mesa; it is scarcely five minutes from the modern crowded streets of El Paso and Las Cruces to the uninhabited desert; the glistening alkali flats of the Animas Valley bear no resemblance to the lush green fields of Mesilla Valley; a rocket from White Sands Rocket Range flashes across the sky above the ruins of a stage coach station; and an airplane flies above the Jomada parallel to El Camino Real, the path of Rodriguez almost four centuries ago.

This is Apacheria, as it was labeled on Spanish maps, and no factor influenced the development of the region more adversely than did the Apaches. They raided the Pueblos, harried the Spanish, feuded with the Comanches, and fought the settlers; as late as 1928 there were Apaches on the warpath. There were no pueblos in this area, and the Spanish themselves held only two settlements, Juarez and Santa Rita, one along the Santa Fe - Chihuahua trail, the other the only mining area they developed.

Along the eastern edge, the Rio Grande,

rising in the lofty San Juan and Sangre de Cristo mountains, flows southward in a ribbon of green amid sandy plains and flanking ridges; it provides the lifeblood of irrigated farms from Mesilla to Brownsville; a narrow strip where cotton, alfalfa, and pecans grow in well-watered profusion just a few miles from where steers dig at dry waterholes and munch on prickly pear cacti.

The northern half of this land of contrast is the Gila Wilderness, the Mogollon volcanic plateau comparable in size and origin with the publicized Yellowstone-Shoshone-Absaroka area. Here rises the Gila River, to wind its twisting way through lonely rock canyons in the midst of thick forests, flowing westward to water most of Arizona and join the mighty Colorado a few miles from the Pacific. This is the backbone of the continent, and we will stand on a spot where a raindrop could split and send one part to the Gulf of Mexico and the other to the Gulf of California, 1200 miles away.

The southern part is typical Basin and Range country where elongate mountain ranges rise like islands from an endless sea of vast greasewood plains. Here the modern miracle of inexpensive electricity drives the driller's bit and the pump to transform the lonely cattle ranges into orchards and cotton fields - and in one place, on the very spot where thirsty explorers fought the Apache for muddy drops from a salty water hole. Here the

ghosts of Spaniards centuries dead, the solitary prospector and his burro, the raiding party of Apaches, and Cibola with its treasure rises out of mirages over the playas.

This area is part of the Mexican Highlands section of the Basin and Range province. The northern border against the Colorado Plateau is obscured by the huge Cenozoic volcanic mass of the Mogollon Plateau which allows only glimpses of complexly faulted and intruded pre-Cenozoic rocks. On the east is the Sacramento section, a gradation from range and valley topography, sloping eastward to the Pecos Valley and the Llano Estacado of the Great Plains. To the south the vast Basin and Range area continues almost to Mexico City. Elevations range from 3700 feet in the Rio Grande Valley near El Paso, to the 10,892 feet of White-water Baldy near Mogollon, and the 10,713 feet of Mt. Graham in Arizona.

The climate is semi-arid to arid although the mountains receive considerable precipitation. Most of the rainfall is in the form of scattered, violent thundershowers during the summer months. Hot dry days and cool nights are the usual fare. As a result, the lower ranges are of bare rock, frequently brilliant in color, carved into craigs along the V-shaped canyons, and surrounded by alluvial fans or pediments that slope down into the bolsons and intermont valleys, whose lowest parts contain playas.

Population density is influenced by three factors: water, mines, and the railroads. El Paso and Las Cruces, along the Rio Grande, Deming and Lordsburg along the railroad, and Silver City on the edge of a great mining district, are the cities. U. S. Highway 85, paralleling El Camino Real, follows the Rio Grande Valley northward; U. S. Highway 70-80 crosses east-west; U. S. Highway 260 trends north-west from Deming to Silver City and beyond; while N. M. Highway 180 crosses from southwest to northeast through the wooded Burro Mountains and over the Black Range. The Southern Pacific Railroad serves El Paso, Deming, and Lordsburg; a branch of the Atchison, Topeka, and Santa Fe Railroad follows the Rio Grande Valley and touches at Deming and Silver City as well as at El Paso.

Extensive irrigation farming is carried on along the Rio Grande and in some of the intermont valleys such as near Deming, the Playas and Animas valleys, and the Mimbres Valley. On the wide plains are large cattle and sheep ranches; in the mountains are mines hoisting the copper, zinc, lead, and fluorite for our industrial nation.

The rocks exposed include a maximum of 15,000

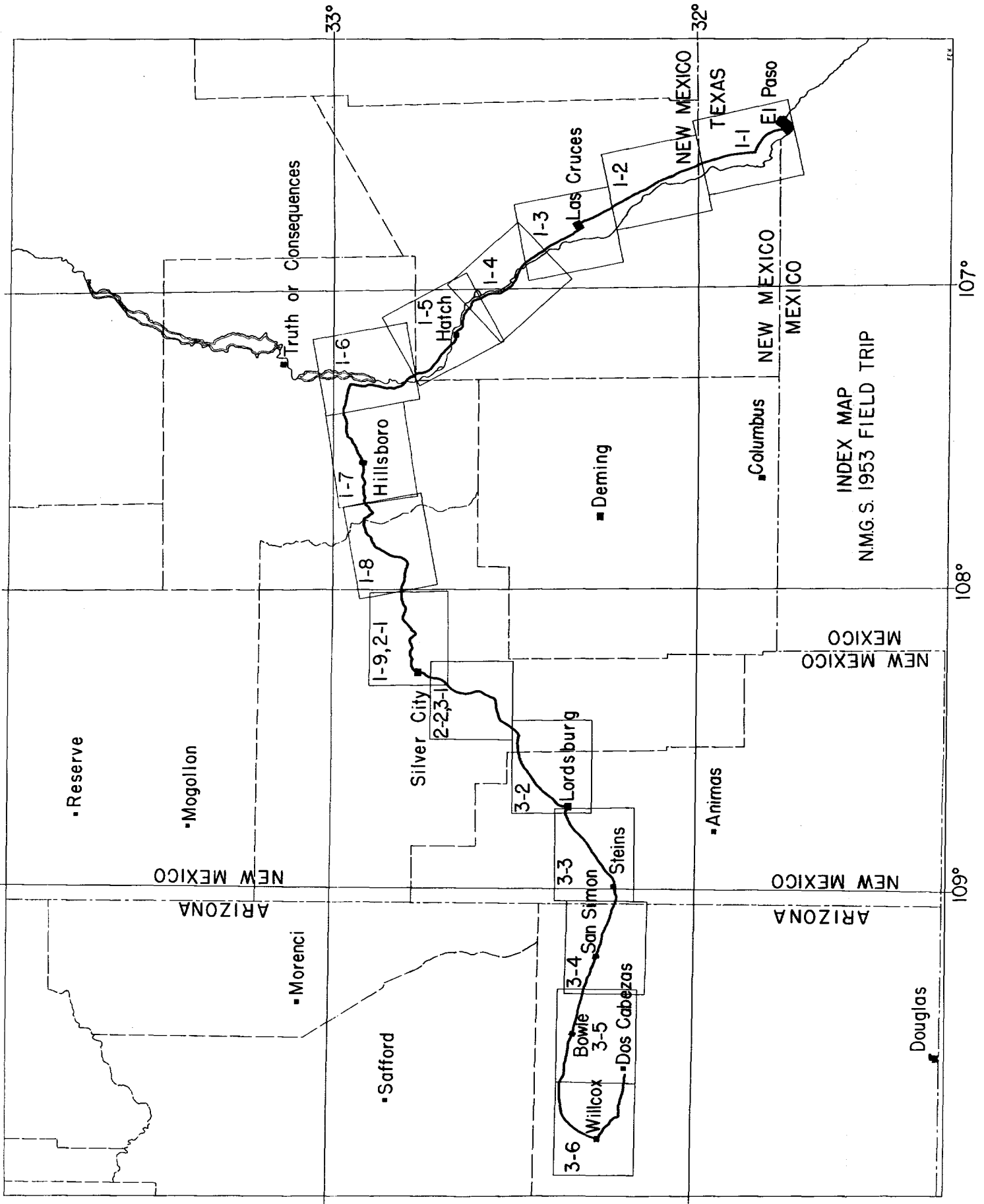
feet of sedimentary beds, and include representatives of Precambrian, Paleozoic, Cretaceous, and Cenozoic time. Pre-Cenozoic strata are exposed in most of the mountain ranges, although many of the upland masses are of Tertiary volcanic rocks. The basins are filled in many places with several thousand feet of late Cenozoic alluvium, so that petroliferous beds may lie at great depths in the depressions. The Cenozoic beds, however, cut across the earlier rocks with a great unconformity, so that there may be hidden anticlines, stratigraphic traps, or faulted domes buried beneath a relatively thin blanket of bolson deposits in some of the intermont valleys.

The conference will begin Thursday with a pre-trip excursion near El Paso to examine outcrops of Paleozoic strata in the Franklin Mountains and the Cretaceous rocks in Cerro de Muleros. The guidebook includes a road log from El Paso to Las Cruces, but the main trip will begin on the north side of Las Cruces. From Las Cruces the caravan will drive to Caballo, then through Hillsboro and Kingston to Silver City. Five stops will be made: (1) near Robledo Mountain, (2) near the Caballo Mountains, (3) along Percha Creek, (4) at Emory Pass, (5) on the west side of Mimbres Valley. Almost continuous exposures of the thick late Tertiary volcanics, late Cenozoic sediments, and Paleozoic sedimentary rocks occur along the route.

Saturday, the conference will examine the Paleozoic and Cretaceous sediments near Silver City, the lead-zinc mines, the Santa Rita copper pit, the Tyrone district, and the White Signal uranium deposits. Sunday, the caravan will drive from Silver City over the Burro Mountains to Lordsburg, then westward through Steins Pass to Willcox and Dos Cabezas, Arizona. Along the route occur outcrops of the Cenozoic bolson deposits, of Quaternary lake sediments, of Paleozoic and Cretaceous strata, and of the tremendously thick Tertiary volcanic beds. West of Lordsburg there will be a stop to discuss areal stratigraphy and structure, and near Dos Cabezas a section from Precambrian to Permian will be examined.

In addition to the road log, the guidebook contains short articles on the rocks exposed along the route, the regional structure, the history of petroleum exploration in the area, and the geology and mineral resources of the Silver City district. There are relatively few detailed geologic maps of southwestern New Mexico, except for the intensive reports on the Silver City district. Much of the geologic record is yet to be, or is being investigated, so that most broad conclusions are tentative, and we hope to whet your appetite, and arouse your interest.

Bon voyage!



INDEX MAP  
NMG.S. 1953 FIELD TRIP