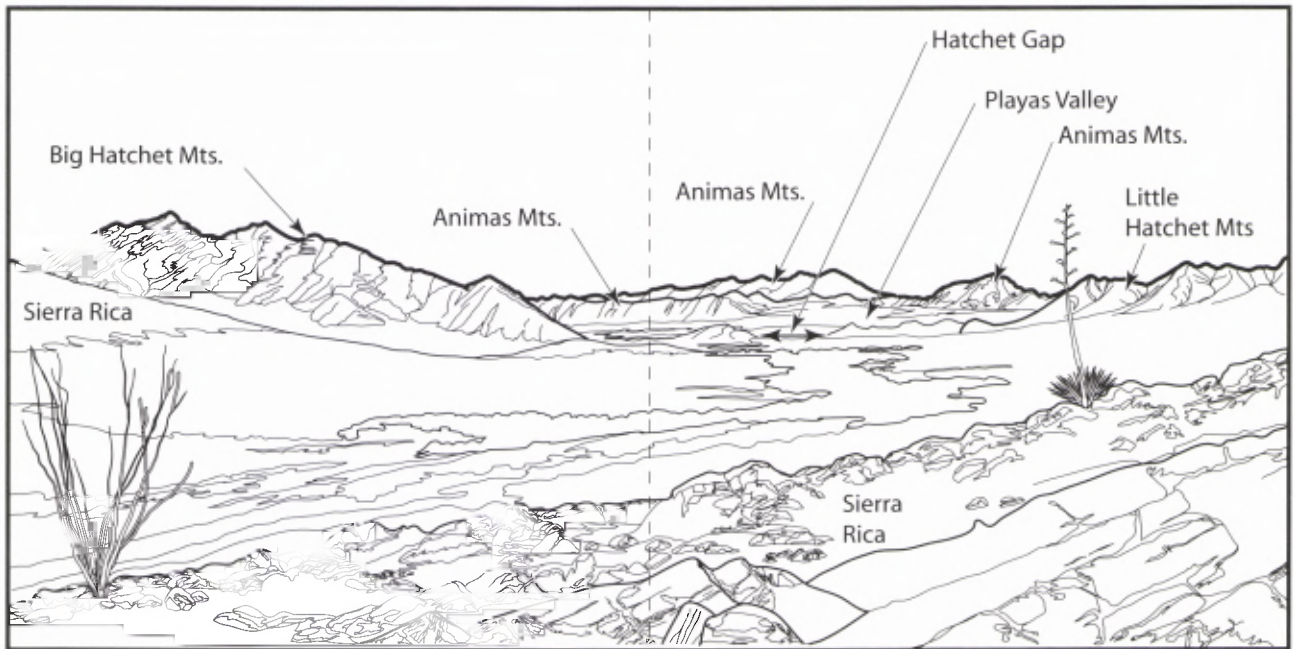


(Back Cover)

(Front Cover)



The cover painting by William Seager features late Tertiary fault-block ranges in the “Boot Heel” region of southwestern New Mexico. The view (back and front cover) is westward through Hatchet Gap to Playas Valley and, on the skyline beyond, the Animas Mountains (front cover left). Hatchet Gap separates the Big Hatchet Mountains to the south (on back cover) from the southern end of the Little Hatchet Mountains, which extend into the painting from the north. Outcrops in the foreground (front and back cover) are on the southwestern flank of Sierra Rica.

Each range contains key outcrops used in interpretation of the tectonic history of southwestern New

Mexico. Tertiary ash-flow tuff and other rhyolitic rocks in the Juniper, Animas Peak, and Tullous cauldrons form much of the Animas Mountains. Permian-Pennsylvanian limestone, deposited in the Pedrogosa basin, is widely exposed throughout the Big Hatchet Mountains, and Precambrian granite forms the backbone of the southern Little Hatchet Mountains. Together, the Precambrian and Paleozoic rocks of the Little and Big Hatchet Mountains are part of a basement-cored, block uplift of Laramide age. Finally, orthoquartzite beds in the foreground are Lower Cretaceous Mojado Formation, post-rift, thermal-subsidence deposits in the Bisbee basin.

# **The Geology of New Mexico**

## **A Geologic History**

### **Editors**

Greg H. Mack

Katherine A. Giles



George S. Austin, *Managing Editor*  
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## EDITORS' MESSAGE

In honor of its 50th anniversary in 1999, the New Mexico Geological Society is publishing separate volumes on the economic geology and the geologic history of the state. This volume, "Geology of New Mexico, A Geologic History," is organized chronologically according to the major depositional and tectonic events in the history of the state. These events and the author(s) of the corresponding chapters in this volume are shown on the facing page. In addition, the important role of geophysics in interpreting earth history is recognized by chapters involving paleomagnetism (Geissman) and geophysical constraints on crustal structure (Keller).

We selected authors who are currently working or have recently worked on the rocks in their chapter, and asked them to provide current information regarding rock types, age and correlation, and paleogeographic/paleotectonic interpretations, as well as a comprehensive reference list. We also encouraged the authors, where appropriate, to explore opposing sides of controversial topics and to define areas of future research. Our ultimate goal was to produce a reference text for students and professionals that will be pertinent for the next decade or more.

We wish to dedicate this volume to those pioneer field geologists of the early and middle part of the 20th century, whose geologic maps and complementary stratigraphic studies are the foundation for understanding the geologic history of New Mexico. Although most of these geologists are now retired, and some have passed away, many were colleagues and mentors to geologists now working in the state, including authors of this volume. There is not enough space to list all of the mappers of New Mexico geology of this generation, but among the most prolific and influential were George Bachman, Elmer Baltz, Edward Beaumont, Edward Binger, Russell Clemons, Carle Dane, John Hawley, Philip T. Hayes, Charles Hunt, Henry Jicha, Vincent Kelley, Frank Kottowski, Phillip McKinlay, Donald Myers, Charles Pillmore, James Ratte, William Seager, Julian Sears, Clay Smith, Robert Thaden, Lee Woodward, and Robert Zeller. One need only read the reference lists at the end of the chapters to see the influence that these and other pioneer geologists had on current ideas.

Greg H. Mack  
Katherine A. Giles

Eon	Era	Period	Epoch	event	chapter author(s)
P h a n e r o z o i c	C e n o z o i c	Quater- nary	Holocene Pleistocene	Rio Grande rift, Basin and Range  ignimbrite flareup	Pazzaglia and Hawley Mack Connell Smith Baldrige Goff and Gardner Chapin, McIntosh, and Chamberlin
		Tertiary	Pliocene		
			Miocene		
			Oligocene		
			Eocene Paleocene		
		M e s o z o i c	Late Cretaceous		
	Early Cretaceous		Western Interior basin	Nummedal	
	Jurassic		Bisbee rift	Lawton	
	Triassic		terrestrial back-arc basins	Lucas	
	Permian		Ancestral Rocky Mountains	Kues and Giles	
	P a l e o z o i c	Pennsylvanian		passive continental margin/ cratonic basins	Armstrong, Mamet, and Repetski
		Mississippian			Kues
		Devonian			Pope
		Silurian			Mack
		Ordovician			
		Cambrian			
		Precambrian Proterozoic			crystalline basement