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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.

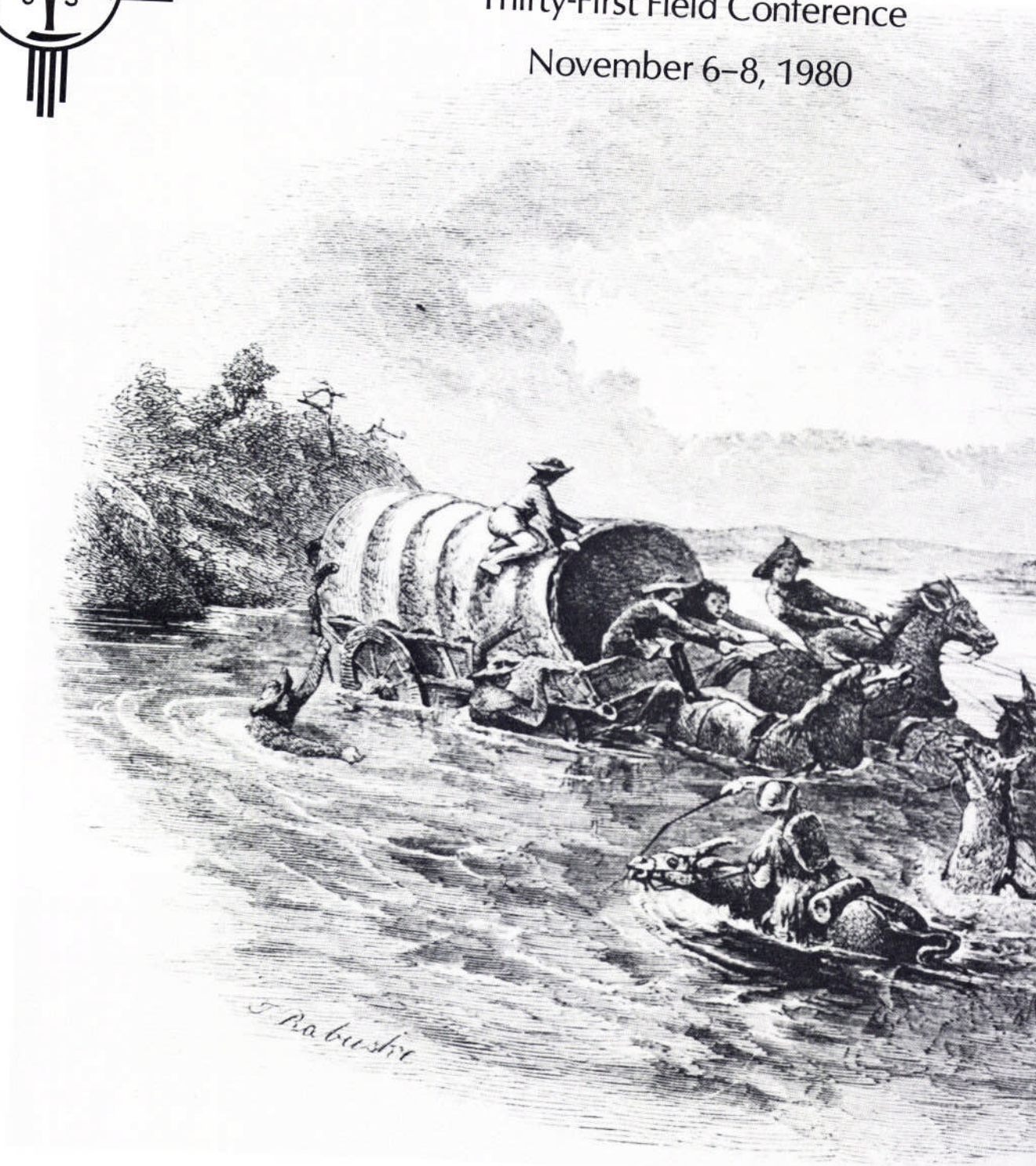
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New Mexico Geological Society
Thirty-First Field Conference
November 6–8, 1980



CROSSING THE PECOS

TRANS-PECOS REGION

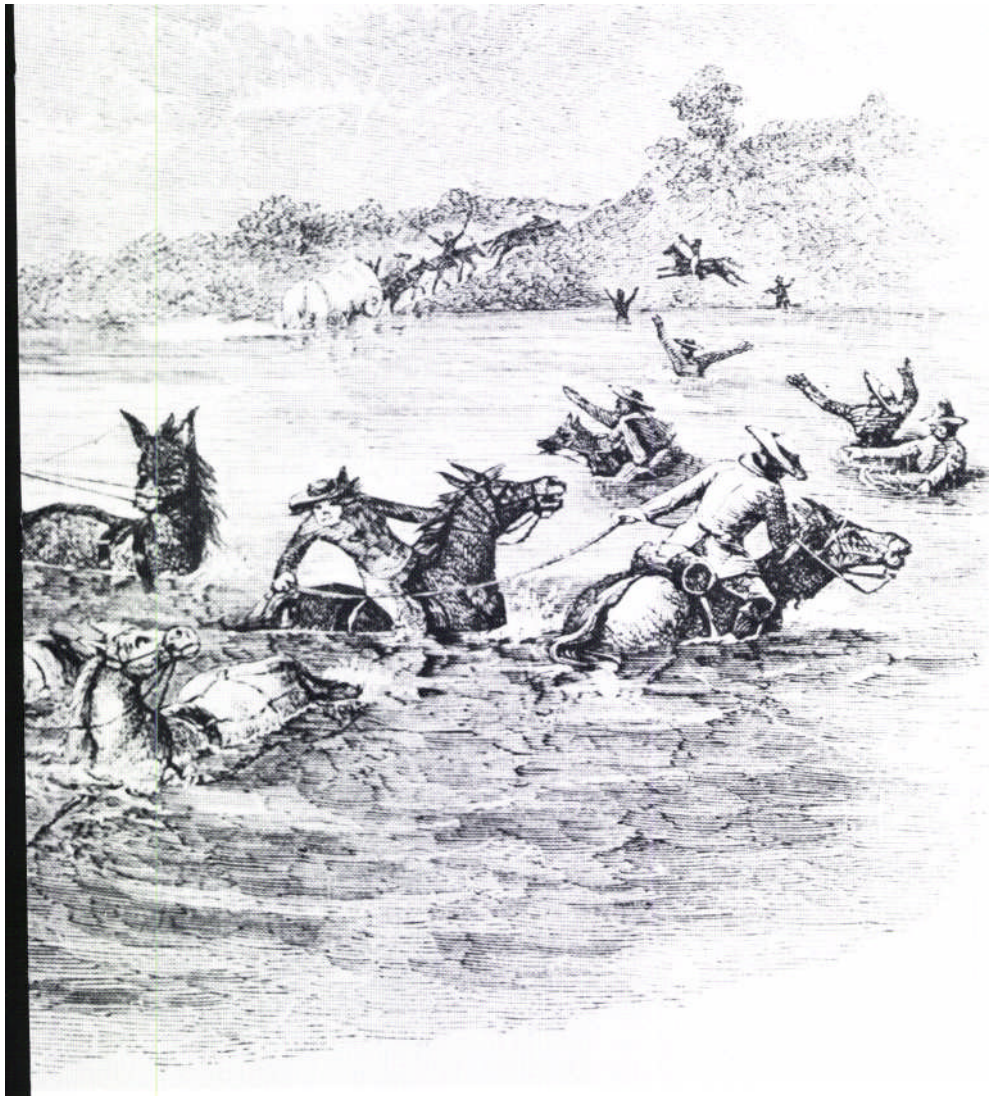
Southeastern New Mexico and West Texas

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PRESIDENT'S MESSAGE

On behalf of the New Mexico Geological Society, I welcome you to its thirty-first consecutive Fall Field Conference. As always, the finished product is due to the efforts of a number of hard-working people to whom we made an offer they couldn't refuse. Special thanks are due General Chairman William McAnulty and to Guidebook Editors Pat Dickerson, Jerry Hoffer and Jon Callender. In fact, "Mac" and Jerry should take two bows, since they also doubled as road-loggers, along with John Hills, Joe Muzzy, Bruce Pearson, Bill Strain and Frank Daugherty. Other indispensables were Registration Chairman Bill Strain, Caravan Chairman Randy Keller, and illustrator Paul Kmiec.

It seems to be traditional to say here that you are wished a blend of geology and good times at the field conference: the geology is surely here, and I expect the good times to materialize as well. If the mixture turns you on, I urge you to contact any member of the Executive Committee and volunteer to help us produce next year's masterpiece, scheduled for the West Slope of Colorado.

Again, welcome, and happy rock-pecking.

John E. Cunningham
President

EDITORS' MESSAGE

Editors harbor covert thoughts of producing a book under utopian conditions: responsible and congenial authors who work within the stated deadlines; papers of substance written with the cognizance that somewhere out there is a reader who may want to glean something from the publication; a printer with the fiscal conscience of Silas Marner, the aesthetic sensitivity of Michelangelo and the mechanical aptitude of Leonardo da Vinci.

We approached those utopian conditions with this volume. Authors submitted manuscripts in timely fashion; almost all were well written—an especially low SP-SE quotient (Silk-Purse-from-Sow's-Ear) for this guidebook; and the University of New Mexico Printing Plant did their traditional excellent job in producing the book. We appreciate all your efforts.

Our appreciation is extended, too, to M. A. Wiley, J. R. Underwood, Jr., D. F. Reaser, W. H. Hiss and D. H. Campbell for providing special illustrations; to Lauren Brown of the Woodson Research Center of Rice University library, for access to the Emory and Bartlett boundary survey volumes; to Sandy Ladewig of the University of Texas at El Paso, for stenographic services; and to P. Kmiec of Gulf Research and Development Co., for drafting assistance.

P. W. Dickerson J.
M. Hoffer
J. F. Callender



DEDICATION

"People are *always asking* me *what* my *title is, thinking, I* guess, *it ought to* be *something* fancy. *I'm just a geologist.'"*

—PHILIP B. KING

J. Hoover Mackin, in presenting the Penrose Medal of the Geological Society of America to King in 1965, stated: "I have recently had the good experience of walking over the ground with [King's map] in hand. The geologic patterns are graceful because they correctly portray the structure, not only where the contacts are exposed—this is merely a matter of accuracy of location—but where they are concealed; they were drawn by a sensitive hand controlled by a sort of reverent understanding of the meaning of the lines . . . The understanding that gives life to the map patterns starts with the mechanisms of origin and transportation of the sediments and the physical and biological environments of deposition, continues through the diagenetic changes that transform the sediments into layered rocks and the response of the heterogeneous sequence of strata to constantly changing stress fields at different depths in the crust during successive periods of regional deformation, and through the erosional processes that finally laid the contorted strata open to the sky. If the geology is to be expressed by the work, these physical, chemical, biologic, and geometric relations must be seen in historical perspective by one man, on the outcrop, as the lines are drawn. This is what I mean when I say that Phil King is a field geologist."

P. B. King the field geologist did not, as he himself is quick to point out, spring full-blown from Zeus' head; his course was influenced by several notable geologists who recognized the ability and enthusiasm of the young geologist. The rudiments of his field geological training, for example, were provided when King had not even declared a major in geology, by C. K. Wentworth during a University of Iowa field course at Baraboo, Wisconsin.

Without sponsorship of any academic or industrial entity, Phil and his brother Robert undertook a survey of Permian rocks in the Glass Mountains in the summer of 1925. Phil became an instructor in geology at the University of Texas the following fall; that year Charles Schuchert, who had retired from Yale, was a visiting professor there, and he had become interested in the marine Permian rocks of the Glass Mountains. Schuchert arranged for financial support for the Kings' next two field seasons there, purchased Robert King's fossil collections for Yale's Peabody Museum, and helped get both to Yale for their doctoral studies.

It was W. S. Adkins, of the Texas Bureau of Economic Geology, who imparted to Phil King an awareness of global stratigraphic stages and of the fossil zones upon which they are based; after discussion with Adkins, stratigraphy could no longer be a provincial discipline for him. N. H. Darton provided further lessons in the science, as well as the art, of field geology; Darton and the Kings, on a foray into the Franklin Mountains, were able to demonstrate that the Hueco Limestone was not just a thick sequence of Pennsylvanian limestones as it had been previously mapped, but comprised units of Devonian, Mississippian and Permian ages as well.

Harry G. Ferguson, Assistant Secretary of the Sixteenth International Geological Congress in the early Thirties, was responsible for the transformation of what had been a rather incidental hobby for King—the synthesis of the geology and tectonics of large regions—into part of his formal professional responsibilities. Ferguson asked King to prepare a general description of the structure of the United States for distribution at the 1933 Congress to be held in the United States. His interest in regional

'Quotation from Jean Gillette, 1967, West Texas Geological Pioneer—P.B. King Filled Map Blanks: San Angelo *Standard-Times,* February 19, 1967. Other sources: Mackin, J. H., 1965, Presentation of the 1965 Penrose Medal to Philip B. King, and King, P. B., 1965, Response by Philip B. King, Penrose Medalist: Geological Society of America Bulletin, v. 76, p. 223-231. Also autobiographical notes prepared by P. B. King for this volume.

geological integration continues: forty-four years later, King's most recent revision of The *Evolution of North* America was published.

William Morris Davis was a geographer who inspired him. Davis, whose principal contribution had been in what is now termed geomorphology, developed a system of "geography" by which any landform could be classified on the basis of structure, stage and process. Although somewhat oversimplified in light of present information, that system provided an approach to surface geologic interpretation, elements of which King continues to apply.

Almost as influential as Davis' geomorphologic concepts, however, were what King describes as his "exquisite renderings of landforms, by pen or pencil, or even by chalk on the blackboard. When I had been at the University of Iowa I took as many courses in art as I took in geology and the other sciences, and on graduation I had even thought of becoming a professional artist. But this seemed to be a chancy undertaking, with no assurance that it would be much of a mealticket. My first opportunity for a paying job was in geology, and a geologist I became. Yet I regretted that I possessed an ability now gone to waste; Davis' own skill in landform drawing showed the means by which I could use this ability in my geologic work." We the readers of King's publications are the real beneficiaries of Davis' inspiration; several exquisite renderings by King of Sierra Diablo and of the Guadalupe Mountains grace this guidebook.

Officially, Philip King retired from the U.S. Geological Survey in 1973 after more than fifty years of service; officially or not, he continues to contribute to the profession, evidenced by his paper in this guidebook. Some authors of papers in this volume have been directly influenced by King, as he was by Adkins, Schuchert, Darton and Davis. Others of us have tracked around as Mackin described, one of King's maps in hand, impressed with the perception of the author who considers himself ". . . just a geologist."

-P. W. Dickerson

PUBLICATIONS OF PHILIP B. KING ON THE TRANS-PECOS REGION

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In press: Geology of the eastern Marathon Basin, Texas: U.S. Geological Survey Professional Paper-.

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FIELD CONFERENCE SCHEDULE

WEDNESDAY, November 5 — **REGISTRATION DAY**

2:00-7:00 p.m. Registration: Ramada Inn, Van Horn, Texas
6:00-8:00 p.m. Cocktail Party (cash bar)

THURSDAY, November 6 — **FIRST DAY**

7:30-8:00 a.m. Board chartered buses in parking lot of Ramada Inn for tour of the Duval sulphur operation, southern Guadalupe Mountains and Delaware Mountains. **(Bring your own lunch.)**

7:00-9:00 p.m. Banquet, Van Horn High School Cafetorium.
Speaker: Dr. Peter Flawn, University of Texas, Austin

FRIDAY, November 7 — **SECOND DAY**

7:30-8:00 a.m. Board chartered buses in parking lot of Ramada Inn for tour of talc deposits of Tumbledown Mountains, Hazel Mine, Precambrian sections, and Tertiary volcanic rocks of the southern Wylie Mountains. **(Bring your own lunch.)**

7:00-9:00 p.m. Bar-B-Q supper at the Van Horn Community Center.

SATURDAY, November 8 7:30-8:00 a.m. — **THIRD DAY**

Assembly of auto-caravan at intersection of 1-10 and U.S. 80, west edge of Van Horn. Today's stops will include the Precambrian rocks of the Carrizo Mountains, the type locality of the Texas Lineament, the Pioneer-Apache talc plant, Tertiary volcanic rocks and fluorspar deposits in the Eagle Mountains, and igneous and sedimentary rocks of the Quitman Mountains. The field conference will end at approximately 4:00 p.m. at the Rest Stop on 1-10 at the north end of the northern Quitman Mountains. **(Bring your own lunch.)**

CREDITS

Front Cover: from J. R. Bartlett, 1854, personal narrative of explorations and incidents in Texas, New Mexico, California, Sonora and Chihuahua connected with the United States and Mexico Boundary Commission survey during the years 1850-1853: New York, D. Appleton and Co., v. 1, p. 118.

End Sheets: (Front) View of Sierra Diablo, from Guidebook to Sierra Diablo region, 1962, Permian Basin Section, SEPM, Publication 62-7; (Back) from P. B. King, 1948, U.S. Geological Survey Professional Paper 215, plate 5.

Frontispiece: from W. H. Emory, 1957, United States and Mexican boundary survey: House of Representatives Ex. Doc. No. 135, 34th Congress, 1st Session, transmitted 29 July 1856, v. 1, part 1, 258 p.; part 2, 174 p.; colored geologic map by James Hall; quotation from C. L. Sonnichsen, 1943, Roy Bean—Law West of the Pecos: New York, MacMillan Co.

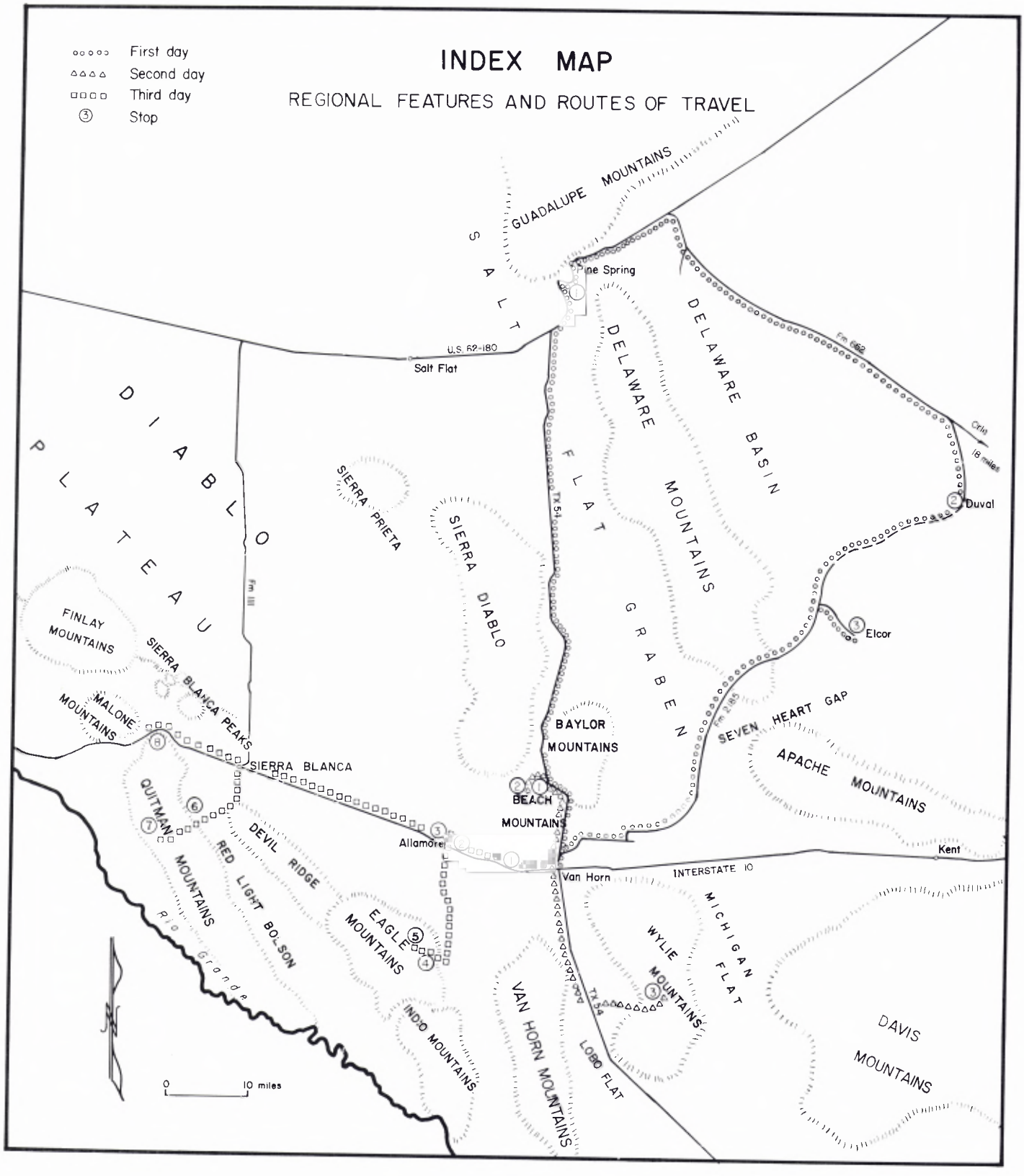
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Ink Sketches: Mammals from C. 0. Martin, 1979, *in* The Mammals of Trans-Pecos Texas, D. J. Schmidley: College Station, Texas A &M University Press; grasses from F. W. Gould, 1979, Common Texas Grasses: College Station, Texas A & M University Press.

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