



Field Guide
to
Selected Cauldrons
and Mining Districts
of the
Datil-Mogollon Volcanic Field
New Mexico

Editors

C. E. CHAPIN W. E. ELSTON

Managing Editor

H. L. JAMES

New Mexico Geological Society
Special Publication No. 7

32ND ANNUAL SPRING MEETING—SOCORRO, N.M.—MAY 18-20

1978



FOREWORD

This volume has been prepared for the spring meeting of the New Mexico Geological Society, May 17-20, 1978. Previous spring meetings of the Society have generally consisted of a technical program, banquet, and business meeting, occasionally accompanied by a one-day field trip. In departing from tradition, our purpose is not to compete with the fall field conference but to make available new data on the Datil-Mogollon volcanic field and its mineral resources. Over the past decade, large areas of volcanic terrane in southwestern New Mexico have been mapped by faculty and students from several universities and by geologists of the U.S. Geological Survey and the New Mexico Bureau of Mines and Mineral Resources. With this effort has come the recognition of more than 20 cauldrons and the realization that much (but not all) of the middle and late Cenozoic mineralization is related to intrusions and hydrothermal systems along the ring fracture zones of cauldrons.

The trip is essentially a short course in volcanic geology with emphasis on ash-flow tuffs, cauldrons, and mineralization. The road logs and papers contain new data on the Socorro, Magdalena, Iron Mountain, Cuchillo Negro, Hillsboro, Organ, Gila and Mogollon districts. The article on the Cuchillo Range by R. H. Jahns and others is the first paper on that area since 1955; the article by W. R. Seager is the first published work on the Organ district since 1935. Several of the road logs were initially prepared and distributed as xerox copies for field trip no. 4 of the Rocky Mountain Section, Geological Society of America, Annual Meeting in Albuquerque, May 19-24, 1976. These logs have since been revised and new data added. New Mexico Geological Society Special Publication No. 5 (Elston and Northrop, editors, 1976) entitled "Cenozoic Volcanism in Southwestern New Mexico" also covers the Datil-Mogollon volcanic field and contains a glossary of stratigraphic terms. U.S. Geological Survey Miscellaneous Investigations Map I-886 (Ratte and Gaskill, 1975) entitled "Reconnaissance Geologic Map of the Gila Wilderness Study Area" also provides some very useful coverage. Enjoy your trip!

C. E. CHAPIN
W. E. ELSTON

CONTENTS

COMMITTEES	Page v
ROUTE MAP	vi

ROAD LOGS

FIRST DAY: Socorro to Truth or Consequences via Magdalena and Winston	<i>C. E. Chapin, Richard H. Jahns Richard M. Chamberlin, and Glenn R. Osburn</i>	1
SECOND DAY: Truth or Consequences to Silver City via Hillsboro and Tierra Blanca Canyon	<i>William R. Seager, Russell E. Clemons, and W. E. Elston</i>	33
THIRD DAY: Silver City to Reserve via Glenwood and Mogollon	<i>James C. Ratté and T. L. Finnell</i>	49
SUPPLEMENTAL LOG NO. 1: Central to Las Cruces via Deming	<i>Russell E. Clemons and William R. Seager</i>	65
SUPPLEMENTAL LOG NO. 2: Organ and Doña Ana Calderas	<i>William R. Seager</i>	73
SUPPLEMENTAL LOG NO. 3: Cliff to U.S. 180 via Rain Creek Mesa and Moon Ranch	<i>James C. Ratté</i>	83
SUPPLEMENTAL LOG NO. 4: Gila Mining District	<i>James C. Ratté</i>	86
SUPPLEMENTAL LOG NO. 5: Little Dry Creek Canyon	<i>W. E. Elston</i>	87
SUPPLEMENTAL LOG NO. 6: Alternate Stop on Whitewater Mesa	<i>Peter J. Coney and W. E. Elston</i>	89
SUPPLEMENTAL LOG NO. 7: Mogollon to Horse Springs via the Bursum Road	<i>Peter J. Coney and W. E. Elston</i>	90
SUPPLEMENTAL LOG NO. 8: Reserve to Magdalena via Horse Springs and Datil	<i>Theodore J. Bornhorst and W. E. Elston</i>	99

ARTICLES

Mid-Tertiary Cauldrons and Their Relationship to Mineral Resources Southwestern New Mexico: A Brief Review	<i>W. E. Elston</i>	107
Exploration Framework of the Socorro Geothermal Area, New Mexico	<i>C. E. Chapin, R. M. Chamberlin, G. R. Osburn, A. R. Sanford, and D. W. White</i>	115
Geologic Section in the Sierra Cuchillo and Flanking Areas, Sierra and Socorro Counties, New Mexico	<i>Richard H. Jahns, D. Kent McMillan, James D. O'brient, and Dorothy L. Fisher</i>	131
The Organ Caldera	<i>William R. Seager and Lionel F. Brown</i>	139

POCKET CONTENTS

Plate 1. Geological and Geophysical Maps of the Socorro Geothermal Area	<i>C. E. Chapin, R. M. Chamberlin, G. R. Osburn, A. R. Sanford and D. W. White</i>
Plate 2. Geologic Cross Sections through the Emory Cauldron, Black Range, New Mexico	<i>William R. Seager</i>
Plate 3. Geologic Cross Section of the Good Sight-Cedar Hills Depression	<i>Russell E. Clemons</i>

COMMITTEES

EXECUTIVE COMMITTEE

H. L. James, *President* New Mexico State Highway Department
J. M. Robertson, *Vice President* New Mexico Bureau of Mines & Mineral Resources
John Cunningham, *Treasurer* Western New Mexico University
R. C. Ewing, *Secretary* University of New Mexico
J. F. Callender, *Past President* University of New Mexico

SPRING MEETING

C. E. Chapin, *General Chairman* New Mexico Bureau of Mines & Mineral Resources

SPECIAL PUBLICATION NO. 7

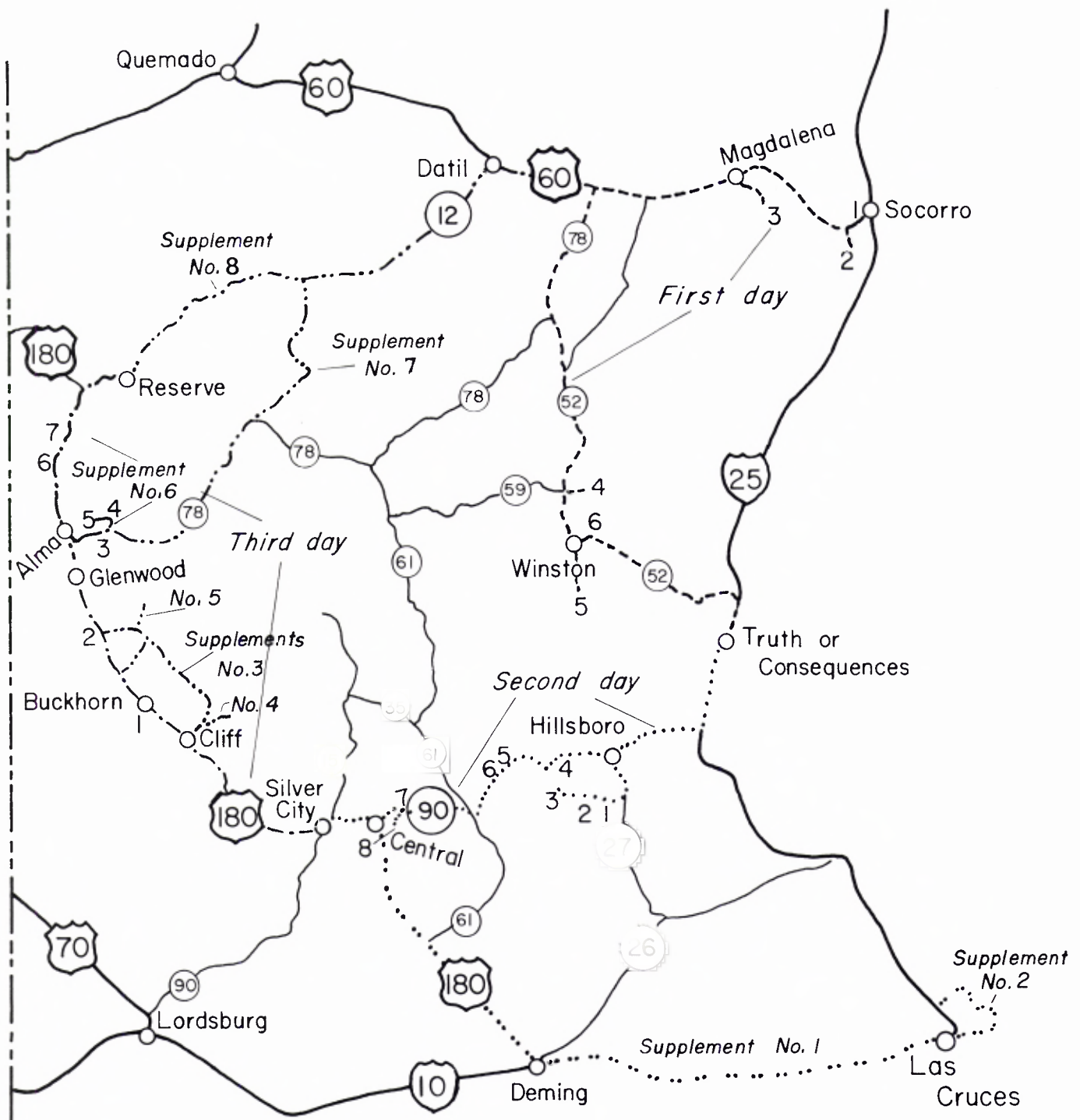
C. E. Chapin, *Co-Editor* New Mexico Bureau of Mines & Mineral Resources
W. E. Elston, *Co-Editor* University of New Mexico
H. L. James, *Managing Editor* New Mexico State Highway Department

REGISTRATION

R. W. Eveleth, *Chairman* New Mexico Bureau of Mines & Mineral Resources

PUBLICATIONS

Russell E. Clemons, *Chairman* New Mexico State University
G. S. Austin New Mexico Bureau of Mines & Mineral Resources
R. A. Bieberman New Mexico Bureau of Mines & Mineral Resources
R. C. Ewing University of New Mexico
H. L. James New Mexico State Highway Department
J. M. Robertson New Mexico Bureau of Mines & Mineral Resources



Route map of Field Trip
Datil - Mogollon Volcanic Field
May 18-20, 1978