

# New Mexico Geological Society

Downloaded from: <http://nmgs.nmt.edu/publications/guidebooks/20>



## *The manganese metallogenic province in the state of Chihuahua, Mexico*

Carlos Garcia-Gutierrez and Luis Garcia-Gutierrez, 1969, pp. 205-206

in:  
*The Border Region (Chihuahua, Mexico, & USA)*, Cordoba, D. A.; Wengerd, S. A.; Shomaker, J. W.; [eds.], New Mexico Geological Society 20<sup>th</sup> Annual Fall Field Conference Guidebook, 228 p.

---

*This is one of many related papers that were included in the 1969 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. Non-members will have access to guidebook papers two years after publication. Members have access to all papers. 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, maps, stratigraphic charts*, and other selected content are available only in the printed guidebooks.

### **Copyright Information**

Publications of the New Mexico Geological Society, printed and electronic, are protected by the copyright laws of the United States. No material from the NMGS website, or printed and electronic publications, may be reprinted or redistributed without NMGS permission. Contact us for permission to reprint portions of any of our publications.

One printed copy of any materials from the NMGS website or our print and electronic publications may be made for individual use without our permission. Teachers and students may make unlimited copies for educational use. Any other use of these materials requires explicit permission.

*This page is intentionally left blank to maintain order of facing pages.*

# THE MANGANESE METALLOGENIC PROVINCE IN THE STATE OF CHIHUAHUA, MEXICO

by  
CARLOS AND LUIS GARCIA-GUTIERREZ

## INTRODUCTION

The State of Chihuahua has been one of the main manganese producers in Mexico. During the past few years it has ranked third in importance—after Hidalgo and Jalisco States—but potentially it may be only second to Hidalgo.

By 1958 nearly 2 million tons of manganese ore were estimated here with an average content of 20% Mn. Because of market problems relatively little has been produced since then, and most of the deposits have been either entirely idle or only producing at a very reduced rate.

## PHYSIOGRAPHY

Most manganese deposits in Chihuahua are located at the bordering zone between two physiographic provinces: the Sierra Madre on the west and the so-called Basin and Range province of the Mexican Plateau on the east. For this reason most manganese occurrences are on relatively low, more or less isolated, mountain chains extending in a general south-southeast to north-northwest direction. These mountains show an advanced erosion cycle. ( See map).

## STRATIGRAPHY

Almost without exception manganese deposits appear in volcanics which have been dated as Middle Tertiary (Miocene ?) . These volcanics were laid on Mesozoic strata of predominantly calcareous character. In only two instances has manganese been found to extend down into the underlying sedimentary rocks.

## PETROLOGY

As expressed above, manganese deposits are enclosed predominantly in volcanic rocks. It is to be noted that, even though basic volcanics are also found on this region, manganese mineralization is restricted to acid flows such as rhyolites and trachytes. Locally also, pyroclastic rocks of analogous acid nature may bear manganese.

Calcareous strata of Mesozoic age may also locally contain minor manganese deposits but, as a rule, manganese mineralization turns to black calcite and to barite as soon as calcareous strata are reached by mine workings.

## STRUCTURAL GEOLOGY

Most, if not all, manganese deposits of this province are in fissure and fault veins striking conformably with the general tectonics of the region: south-southeast to north-northwest. A few are oriented east-west. All the structures

show profuse brecciation which has been cemented by manganese oxides; displacements are in general normal, which seems to point out tensional stresses as the cause of regional fracturing. Their attitude is generally close to vertical; they can be followed for some tens to hundreds of meters along the strike. Locally they may be 4 to 5 meters thick, although average width is in the order of 1 to 2 meters. Depth of mineralization is relatively shallow, with perhaps the only exception at Mina La Venganza, in Terrenates area, where manganese ore is found more than 100 meters from the surface. In the average, strike lengths of 100 to 200 meters, and depths of 35 to 40 meters are found.

## PARAGENESIS

Occurrence of some minerals, such as barite and tungsten-bearing ores, in relation with some manganese deposits, seems to bear out the idea that they originated from ascending hydrothermal solutions. However, their shallowness, the predominance of psilomelane and pyrolusite, their close association with competent acid volcanic rocks, and the fact that all deposits seem of the cavity filling type, with very scarce replacement, seem to suggest that they are rather of the so-called "black calcite" type of deposits in which leaching of this mineral gave rise to important concentrations of manganese oxides by supergenetic processes.

All this may be confirmed by the finding of barite and white and black calcite in places where mining has proceeded to depths at which manganese practically ceases to exist, but which can and have been mined for barite, such as at Talamantes area.

A hydrothermal origin for the manganese-bearing solutions is here suggested, with concomitant deposition in favorable rocks and subsequent concentration by secondary processes.

## CONCLUSIONS

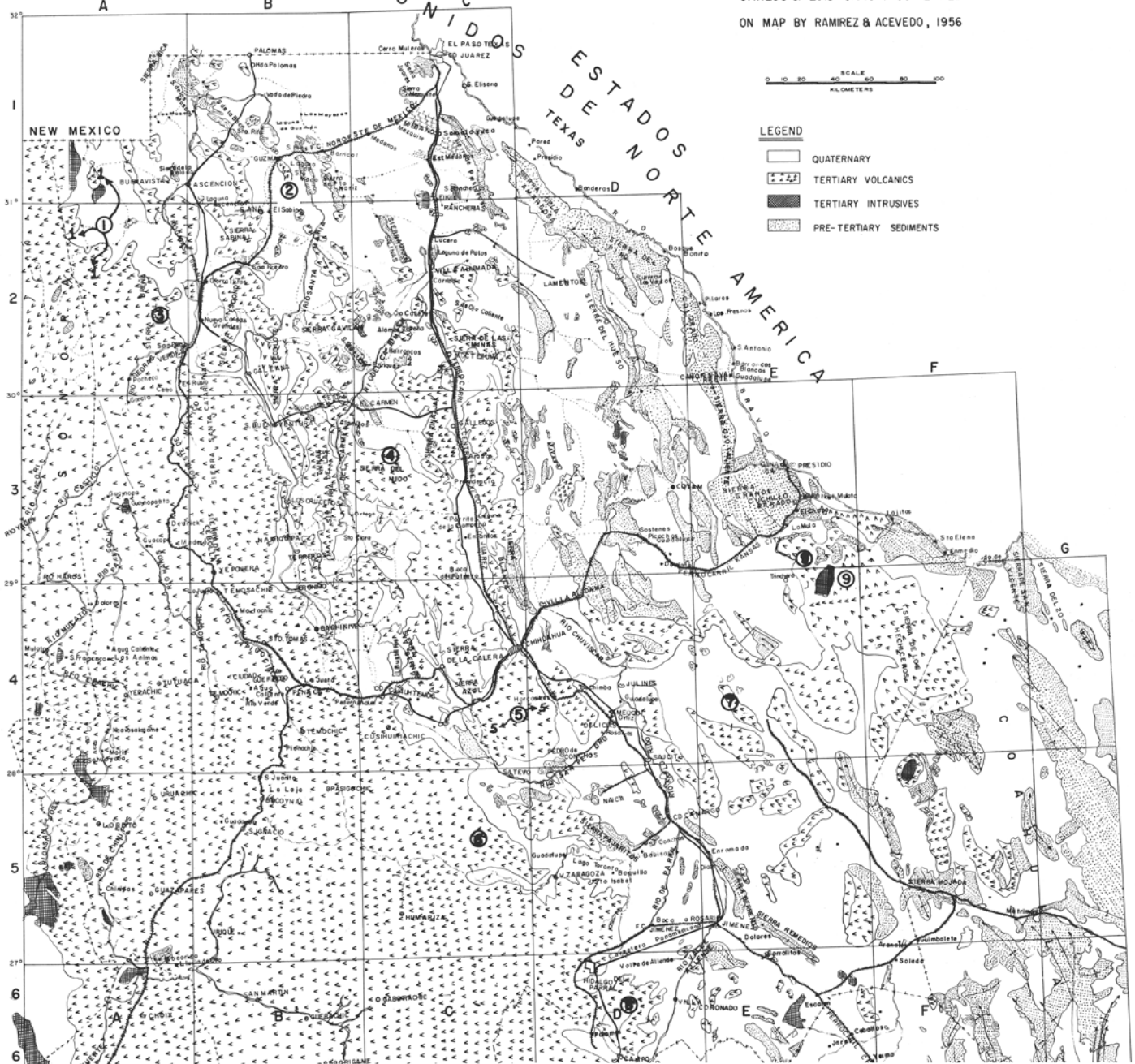
Whichever explanation is accepted, several facts have to be borne in mind when prospecting or exploring for these types of deposits: (1) manganese deposits in this province are always in thin volcanic flows of acidic composition; (2) these rocks are always competent; ( 3) only manganese oxides are found; (4) and such volcanics are always overlying calcareous Mesozoic sediments.

# THE MANGANESE-METALLOGENIC PROVINCE

CHIHUAHUA, MEXICO

CARLOS & LUIS GARCIA-GUTIERREZ

ON MAP BY RAMIREZ & ACEVEDO, 1956



## MINING AREAS

The attached map shows only 9 of the more important manganese areas in Chihuahua State:

Location

- A-1 . . . . . 1—Casa de Janos, Las Vegas and Sierra de Enmedio.
- B-1 . . . . . 2—Los Borregos.
- A-2 . . . . . 3—Casas Grandes.
- C-3 . . . . . 4—Terrenates.
- C-D-4 . . . . . 5—Sierra de la Silla.
- C-5 . . . . . 6—Satevo.
- E-4 . . . . . 7—Los Organos and Tinajas.
- D-6 . . . . . 8—Talamantes.
- E-3, 4 . . . . . 9—Los Volcanes and San Carlos.

## SELECTED BIBLIOGRAPHY

- Ayub, A. R., and Garcia-Gutierrez C., Yacimientos de manganeso en el Estado de Chihuahua, Consejo de Recursos Naturales no Renovables, Bull. 43, 1958.
- Rocha, V. S., and Wilson, I. F., Los yacimientos de manganeso de Talamantes, Municipio de Allende, Estado de Chihuahua, Comité Directivo Invest. Recursos Min. de Mexico, Bull. 18, 1948.
- Rodriguez, C. J., and Trask, P. D., Los yacimientos de manganeso de la Republica Mexicana, Com. Direc. Invest. Rec. Min. de Mexico, Bull. 19, 1948.
- Symposium sobre yacimientos de manganeso, Vol. 3, America, XX Session, International Geological Congress, 1956.
- Wilson, I. F., Manganese deposits of the Sierra de Borregos, Chihuahua, Mexico. Symposium on manganese deposits, Vol. 3, Mexico, XX International Geological Congress, 1956.