



EXCURSION D.

Post Congress Excursion

Early Jurassic volcanic-sedimentary remnants at the ancient western equatorial margin of Pangea and Late Jurassic epicontinental carbonate and carbonate-siliciclastic successions from central and northern Mexico

February 10 to 13, 2018.

MAXIMUM NUMBER OF PARTICIPANTS: 15(FIFTEEN)

EXCURSION FEE \$500 US DLLS.

Leaders:

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GENERAL INFORMATION ABOUT THE FIELD TRIP:

The field trip comprises the visits to important exposures of remnants of the western equatorial margin of Pangea, and to two type localities from Upper Jurassic rocks.

The first region that will be visited in this excursion is the Sierra de Catorce in San Luis Potosí State. Actually, and in the past, the most important town in the area (altitude 2750 m) is Real de Catorce. Due to discovery of very huge silver mines, many people looking for luck arrived to the area, but Sierra de Catorce was an inhospitable region without roads or water. At the beginning no authorities existed and the organization was a big chaos. The town was founded in 1779, and Silvestre López Portillo was the first local authority giving name to the town as *Real de Minas de Nuestra Señora de la Limpia y Purísima*

Concepción de Guadalupe de los Álamos de Catorce. At the beginning of the nineteenth century Real de Catorce was the second largest producer of silver. From 1885 to 1905, Vicente Irizar Arostegui bought the Santa Ana mine, no longer productive, but after 10 years of work the installation of the most modern and sophisticated equipment, unique in the country, allowed to open new galleries resulting in a high performance of the mine. This improvement brought about the second mining boom in Real de Catorce lasting for many years. In June 1895, the president of Mexico, Porfirio Díaz, re-inaugurated the mine. The most portentous work we owe to the great Don Vicente is the construction of the tunnel Ogarrío (in honor to the Spanish village so called Ruesga in Cantabria), an endeavour which involved great difficulties and huge investments. The tunnel was inaugurated on April 2, 1901 after four years work. Later on Real de Catorce fell into oblivion and almost total abandonment. A recent, in progress recovery of Real de Catorce relates to touristic activities.

Geologically, the Sierra de Catorce is an uplifted block in the southernmost basin and range province in northern San Luis Potosí. Most of the oldest stratigraphic units in this region are well exposed, including upper Triassic turbidites underlying a marine marginal succession which include the Triassic-Jurassic boundary deposits according to detrital zircon age-determinations. Following up, the succession includes volcanic and volcanoclastic strata related to the Early to Middle Jurassic “Nazas Arc”, overlain by conglomerate-breccia and red sandstones of the La Joya Formation, which gradually changes upward into carbonates of the Zuloaga Formation. The epicontinental shallow carbonate shelf-system of the Altiplano is represented by the Zuloaga Formation, and lateral equivalent across Mexico, which records the late Jurassic marine transgression occurred during the early aperture of the Gulf of Mexico basin. Oxfordian age Zuloaga carbonates are of, rich in benthic fauna and overlain by the mixed carbonate-siliciclastic deposits of the La Caja Formation. The latter represents progressing transgression across north-central Mexico with local variations due to relative sea-level fluctuations and subsidence. Common macroinvertebrates, mainly ammonites and bivalves of lower Kimmeridgian to lower Berriasian) ages are recorded throughout this formation. Short periods favorable to brachiopods, serpulids and/or belemnites are known, especially within the Tithonian.

This field trip will provide an overview of Sierra de Catorce outcrops including typical successions that allow to interpret the tectonic-paleogeographic evolution of the ancient Pacific margin of Mexico during late Triassic-to-early Jurassic times. Extensional basins related to the Gulf of Mexico or probably in part as back-arc extension related to the Nazas arc can be interpreted. Finally, Upper Jurassic strata in the region represent the basal sedimentation occurred in the Central Mexico Mesozoic Basin, represented by a Carbonate Platform during the middle to late Oxfordian, following by siliciclastic deposits with abundant invertebrate fauna, characterized by ammonites and benthics.

We will also visit the town of Real de Catorce with the first “Casa de Monedas” (The house of the currency or The mint) from Mexico, with old houses, actually reconstructed as Hotels, and other nice places and cobblestone streets.

The second region to be visited is the Mazapil region in Zacatecas state, also an important mining region in the past centuries. In the mid-sixteenth century, thanks to the exploitation of prolific plutonic gold ores began to emerge the two most remote towns

Concepcion del Oro and Mazapil, Zacatecas, both little known today but of great economic importance in all the Nueva España (the New Spain) during the seventeenth and eighteenth centuries.

The Mazapil municipality, is located in a rather open valley, about 2350 meters above sea level; because of the importance of the silver and gold ores, the region was geologically studied since 1836 by Burkart. But for our objective their importance falls in Jurassic and Cretaceous stratigraphy and paleontology. In the past century the region was studied first by Carl Emmanuel Burckhardt (1906, 1930), the paleontological information published by Burckhardt still represents the solid, foundation for Upper Jurassic biostratigraphy in Mexico. One of the most important and traditionally studied localities is the San Matias Canyon, located in Sierra de Santa Rosa, south to the Concepcion del Oro Town. After the pioneer contributions by Burckhardt, this locality has been studied by several authors also focused in paleontology and paleobiogeography (Imlay, 1939, Villaseñor, 1991; Cross, 1999; Olóriz et al., 1997, 2016; de la Mora et al. 2000; Villaseñor et al., 2000, 2012; Pessagno and Martin, 2003).

FEE: 500 US DOLLARS (INCLUDING MEALS, LODGING, TRANSPORTATION FROM SAN LUIS POTOSÍ TO THE LOCALITIES AND RETURN TO SAN LUIS POTOSI, CITY).

GENERAL PROGRAMM:

<p>SATURDAY February 10</p>	<p>The Sierra de Catorce 7:00 AM. Departure from the Hilton Hotel (San Luís Potosí) to Sierra de Catorce. 11:00 PM. Stop 1. Los Catorce: Late Triassic turbidites of the Zacatecas Formation (“the Potosí Fan”). The Zacatecas Formation in the Sierra de Catorce is well exposed around the town of Los Catorce and consists of shale and interlayered siltstone and fine sandstone beds. Lunch 15:00 PM. Stop 2. Cerro El Mazo: Triassic-Jurassic boundary in the “Cañón General” succession. Outcrops of the informal unit named “Cerro El Mazo Beds will be show west and east of the town “Los Catorce”, along the road to Santa Cruz de Carretas, and along the road to Real de Catorce. These sections represent, respectively, west and east dipping flanks of a north-south striking antiform. Along the canyon, the nucleus of the structure shows the oldest stratigraphic units known from the Mesa central. 16:00 PM. Stop 3. El “Mirador” Potrero de Catorce. The point known as “El Mirador”, close to the entrance of the Ogarrío tunnel, offers a good overview of the</p>
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	<p>strongly deformed Jurassic-Cretaceous rocks belonging to the detached cover of the Sierra de Catorce.</p> <p>19:00 PM. Accommodation and dinner at the Real II Hotel</p>
<p>SUNDAY February 11</p>	<p>The Sierra de Catorce</p> <p>8:00 AM. Breakfast at the Real II Hotel.</p> <p>9:00 AM. Stop 4. "Puerta del Sol", Real de Catorce. View of the <i>Cañón General</i> (General Canyon) of Sierra de Catorce: Polymictic conglomerate and conglomeratic red sandstones of the basal member of La Joya Formation (Callovian-Oxfordian) form a prominent cliff west of Real de Catorce, and offer a panoramic view of the stratigraphic units exposed in the Canyon.</p> <p>12:00 PM. Depart to Alamitos village. The upper Jurassic section. Several stops through the mountain road to see the La Caja/¿Taraises?/Tamaulipas inf (Cupido) boundary? boundary and the characteristic phosphoritic beds of the La Caja Formation. Lunch</p> <p>14:00 PM. Visit to the type locality of Del Castillo & Aguilera (1895).</p> <p>18:00 PM. Arriving at Real de Catorce. Visit to the Town</p> <p>20:00 PM. Dinner at the Real II Hotel. Dinner & Folk Music</p>
<p>MONDAY February 12</p>	<p>San Matias Canyon</p> <p>8:00 AM. Breakfast at the Real II Hotel.</p> <p>9:00 AM. Leave for Real de Catorce to San Matias Canyon.</p> <p>12:00 PM. Arrival to the canyon to visit the type locality of Burckhardt, 1906. Outcrop of the Oxfordian to Berriassian section.</p> <p>14:00 PM. Lunch at the canyon</p> <p>17:00 PM Accommodation at the Hacienda San Javier Hotel at Concepción del Oro.</p> <p>20:00 PM Dinner at Del Rio Restaurant. Cabrito meat at northeaster style.</p>
<p>TUESDAY February 13</p>	<p>8:00 AM Departure from the Concepción del Oro Town.</p> <p>9:00 AM Breakfast on the road to San Luis Potosi City.</p> <p>2:00 PM Arrival to the Airport or Bus station. End of the field trip</p>