

FOREWORD TO THE SPECIAL ISSUE ON THE TECTONIC AND MAGMATIC EVOLUTION OF MEXICO DURING THE CENOZOIC

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Guest Editor

On May, 1997, the IV Symposium on the Cenozoic Tectonics and Volcanism of Mexico was organized, within the II Convention on the Geologic Evolution of Mexico, that took place in Pachuca, Hidalgo, Mexico. Several papers were presented in this symposium, that included the state of the art in these topics. Due to the high quality of the new data shown during the symposium, it was decided to gather these works in a special volume and publish them in order that the scientific community and public in general could have access to them in a journal with high publishing quality and good diffusion in Mexico and other countries. The *Revista Mexicana de Ciencias Geológicas* of Instituto de Geología of the Universidad Nacional Autónoma de México was the choice. The Editorial Department kindly accepted to publish the special volume following strict refereeing standards for the manuscripts submitted. Fortunately, the process of preparing the volume was not significantly delayed, since submission of the papers to the guest editor was during the interval of September to December, 1997, and the final versions were sent to the Scientific Editor Coordinator of the journal by December, 1998.

This volume includes topics of Cenozoic volcanic rocks, tectonics, and stratigraphy of Sonora, the Mexican Volcanic Belt, the lacustrine deposits of southern Mesa Central, the Jalisco Block at western Mexico, and the southern Mexico's volcanic province at Guerrero. The organization of the papers was done considering the geographic location of the studies, from south to north.

The paper by Dante Morán-Zenteno and collaborators entitled "Stratigraphy, geochemistry and tectonic significance of the Tertiary volcanic sequences of the Taxco-Quetzalapa region, southern Mexico", provides the description and new K-Ar ages of mid-Tertiary volcanic rocks in the northern part of the State of Guerrero. They report this sequence as part of the mid-Tertiary Volcanic Province of southern Mexico, which includes large volume silicic ignimbrites similar in aspect and age to those of the Sierra Madre Occidental, and conclude that this volcanism is correlatable with that of the Sierra Madre Occidental north of the Mexican Volcanic Belt. This is an important contribution as it has been generally assumed that the magmatism of the Sierra Madre Occidental ends at the latitude where it intersects the Mexican Volcanic Belt. Therefore, there was apparently a single magmatic (or volcanic) province all along western Mexico that includes the volcanic rocks of the Sierra Madre Occidental and the mid-Tertiary Volcanic Province of southern Mexico.

The paper by Hugo Delgado and collaborators entitled "Geology of Xitle volcano in southern Mexico City—a 2000-year-old monogenetic volcano in an urban area", provides the stratigraphy and new C-14 ages of the Xitle volcano, located south of Mexico City. The relevance of this study is emphasized as part of Mexico City is built atop Xitle's products, which area is only 2,000 years old. In fact, the basaltic lava flows of Xitle buried the prehispanic settlement of Cuicuilco. Thus, this study is particularly important for the volcanic hazard that similar volcanism could pose to Mexico City and for its archeological implications. It also offers the basis for continuing studies on Xitle and similar volcanoes of the Chichinautzin Volcanic Field.

Gabriel Valdéz-Moreno, Gerardo J. Aguirre-Díaz, and Margarita López-Martínez report the volcanic evolution of an ancient stratovolcano of the Mexican Volcanic Belt, in the paper entitled "El volcán La Joya, estados de Querétaro y Guanajuato—un estratovolcán miocénico del Cinturón Volcánico Mexicano". The work includes a geologic map of the volcano and new ^{39}Ar - ^{40}Ar ages of pre-, syn- and post-volcano lavas. The volcano is about 10 Ma and represents one of the oldest composite volcanoes of the Mexican Volcanic Belt. The discussion includes the observation that the volcano is not cut by the regional normal fault system known as Taxco-San Miguel de Allende, in spite of being located on the extrapolation of these faults, and younger mafic lavas from a peripheral volcanic field and in contact with the southern flank of the volcano are affected by this faulting; thus indicating that this regional system ends just south of the La Joya volcano.

The paper by Wade E. Miller and Óscar Carranza-Castañeda, entitled "Importance of late Tertiary carnivores and equids from the Transmexican Volcanic Belt", shows us that large lakes existed at the northern margin of the Mexican Volcanic Belt during the Miocene and Pliocene, based on vertebrate fossils gathered at the lacustrine sediments deposited in these paleolakes. Besides the great importance for the paleontologic record of North America, this study can be used to infer tectonic models of the region.

A topic similar to the latter, but with a geochronological approach, is dealt in the work of Bart J. Kowallis and collaborators, entitled "Fission track and single crystal $^{40}\text{Ar}/^{39}\text{Ar}$ laser-fusion ages from volcanic ash layers in fossil-bearing Pliocene sediments in central Mexico". As the title indicates, this paper documents the stratigraphic and fossil record of the sedimentary sequence of the Dolores-San Miguel de Allende basin (Xocostle basin), at the southeastern part of the State of Guanajuato. The $^{39}\text{Ar}/^{40}\text{Ar}$ ages of ash beds within the lacustrine strata

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range from 4.6 to 3.9 Ma, improving the precision of the age of the vertebrate fossils and the corresponding stratigraphy. This information is very useful to learn about the depositional time range of this basin and its tectonic and sedimentological relationship with the neighboring volcanic ranges of both the Mesa Central and the Mexican Volcanic Belt.

The work of Víctor Hugo Garduño-Monroy and collaborators, entitled “La falla Tamazula—límite suroriental del bloque Jalisco y sus relaciones con el complejo volcánico de Colima, México”, proposes three tectonic interpretations of the Tamazula fault, a major NE-oriented normal fault. One interpretation is that this fault marks the southeastern boundary of the Jalisco Block, instead of the Colima graben as has been proposed by other authors before; a second one relates the fault with the Colima volcanic complex, as it directly overlies the fault trace, making also the relationship between volcano sector collapses and earthquakes along the fault. In the third interpretation, the authors argue that the fault was reactivated in 1990

based on the seismicity record. This paper is provocative and well documented and probably will cause some debate.

Francisco J. Grijalva-Noriega and Jaime Roldán-Quintana present the work entitled “An overview of the Cenozoic tectonic and magmatic evolution of Sonora, northwestern Mexico”. This paper summarizes the stratigraphic record of almost all the State of Sonora (the paper omits only the southernmost tip), and provides a series of geologic maps that show the distribution of each major Sonoran Cenozoic stratigraphic unit. On the basis of these data, the authors discuss the geologic evolution of Sonora, dividing it into three time intervals, the Paleocene-Oligocene, the early-middle Miocene, and the late Miocene-Holocene, emphasizing the major tectonic events, from the compressional stress regime related to subduction, to the extensional stress regime and core-complexes formation, to the strike-slip faulting and rifting along western Sonora.

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