

MEXICAN VOLCANIC BELT

PART 2

S. P. VERMA
Guest Editor

PREFACE

Part 1 of the Special Volume on Mexican Volcanic Belt (MVB) contains a total of nine papers published in *Geofísica Internacional*, Vol. 24, No. 1, 216 p. The second part of the MVB Volume comprises also nine papers, all of which are written in English for a greater benefit of the international scientific community. Twentyseven authors from sixteen institutions have contributed to this special issue.

The first paper by B. G. Polak, V. I. Kononov, E. M. Prasolov, I. V. Sharkov, R. M. Prol-Ledesma, A. González, A. Razo and R. Molina-Berbeller, reports the estimates of terrestrial heat flow based on $^3\text{He}/^4\text{He}$ ratio in gases collected from thermal manifestations. These authors use a worldwide correlation of actually measured terrestrial heat flow and the isotopic composition of helium in thermal fluids, in order to obtain values of regional (background) heat flow in southern Mexico. They claim an accuracy of about 10% for their "non-traditional" approach.

In the second paper, J. F. W. Negendank, R. Emmermann, R. Krawczyk, F. Moser, H. Tobschall, and D. Werle present a regional geological and geochemical study of the eastern MVB. These authors favor that the MVB continues beyond the Altiplano area, as far east as the coast of the Gulf of Mexico. On the basis of a large number of major and trace element data as well as a few radiogenic isotope measurements, they conclude that the origin of magmas in the eastern MVB cannot be explained by direct derivation from the oceanic lithosphere. However, the subduction of the Rivera and Cocos plates beneath the North American plate is envisioned to cause or induce the volcanism in the MVB.

The third paper is by T. Hasenaka and I. S. E. Carmichael and contains a compilation of location, size and geomorphological parameters of over one thousand small volcanic centers in Michoacán and Guanajuato (central Mexico). They report that the highest volcano concentration occurs at about 250 km from the Middle America trench (MAT) and estimate an eruption volume rate of $0.8 \text{ km}^3/1000 \text{ y}$ for the entire volcanic field.

The fourth paper by R. M. Prol and G. Juárez concerns the use of geochemical analyses of thermal springs to determine their silica temperatures and thermal regime in the MVB. They present an isotherm map of central Mexico and conclude that the MVB is characterized by rather high spring temperatures (average $\approx 120^{\circ}\text{C}$), having a few local maxima probably related to active geothermal systems.

In the fifth paper, J. Nieto-Obregón, L. A. Delgado-Argote and P. E. Damon report on a geochronologic, petrologic and structural study of Río Grande de Santiago area situated at the juncture of the MVB and the Sierra Madre Occidental (SMO). They divide the rocks of the study area into seven units ranging in age from late Oligocene to Pleistocene or younger. Although the older units can be correlated to SMO, the presence of an early to middle Miocene unit leads the authors to propose a proto-MVB. They also infer the existence of a large right-lateral strike-slip fault system in the area.

The next paper by S. P. Verma and M. A. Armienta-H. describes a local Sr-isotopic and trace element study of an important monogenetic volcanic area situated towards the south of Mexico City in central MVB. These authors conclude that the magmas are derived from the upper mantle with only a small contribution from altered oceanic crust, subducted sediments or sialic continental crust.

The seventh paper by A. M. Kudo, M. E. Jackson and J. W. Husler presents a study of bulk-rock and mineral-microprobe data on Recent volcanic rocks from Volcán Pico de Orizaba, the highest volcano of the MVB. They conclude that xenolithic contamination plays an important role in the petrogenesis of these magmas.

In the eight paper, J. F. Luhr and P. Lazaar discuss the relation of the southern Guadalajara volcanic chain in western MVB with a major on-going episode of crustal rifting. These authors also report major and trace element chemical data on volcanic products of this area and compare them with other volcanoes in the western MVB.

The final paper by F. Medina M. comments on the possible relationships between volcanic events and large earthquakes in the Colima area situated in western MVB. He compares these results with those published for other seismovolcanic areas.

It could be pointed out that the third and last part of the Special Volume on the Mexican Volcanic Belt (now under preparation) will present the final collection of

papers related to various aspects of this important volcanic province and will also include an overview at the time of culmination of these efforts.

ACKNOWLEDGEMENTS

The following is the list of referees according to countries who collaborated with the guest editor in the preparation of Part 2 of the MVB Special Volume.

Austria: A. E. Scheidegger, Institut für Theoretische Geodäsie und Geophysik, Technische Universität, Wien.

Brasil: S. S. S. Iyer, Comissão Nacional de Energia Nuclear, São Paulo.

England: A. D. Saunders, Department of Geology, University of Leicester, Leicester.

Federal Republic of Germany: J. F. W. Negendank, Abteilung Geologie der Universität Trier, Trier; W. White, Max-Planck Institut für Chemie, Mainz.

France: C. Robin, Faculté des Sciences de l'Université de Clermont-Ferrand II et C. N. R. S., Clermont-Ferrand.

Italy: R. Scandone, Osservatorio Vesuviano, Napoli.

Japan: S. Aramaki, Earthquake Research Institute, University of Tokyo, Tokyo; I. Yokoyama, Usu Volcano Observatory, Hokkaido University, Sapporo.

Mexico: D. Nieva, Departamento de Geotermia, Instituto de Investigaciones Eléctricas, Cuernavaca; S. K. Singh and D. J. Terrell, both at Instituto de Geofísica, UNAM, México, D. F.

New Zealand: W. F. Giggenbach, Chemistry Division, Department of Scientific and Industrial Research, Petone.

U. S. A.: R. Batiza, Department of Earth and Planetary Sciences, Washington University in St. Louis, St. Louis; M. Fisk, College of Oceanography, Oregon State University, Corvallis; A. Kilinc, Department of Geology, University of Cincinnati, Cincinnati; J. F. Luhr, Department of Geology, Franklin and Marshall College, Lancaster; J. J. McGee, U. S. Geological Survey, Reston; A. H. Truesdell, U. S. Geological Survey, Menlo Park.

I am very much grateful to the members of the Editorial Staff of Geofísica Internacional (F. Graffé, T. del Cid, N. Figueroa, J. Torres and G. García) for their assistance in the preparation of this special issue. I wish to acknowledge also the support by J. Bouton (Ex-Editor of the Journal), G. Fernández de la Garza (Executive Director of IIE), P. Mulás del Pozo (Director of Energy Resources Division, IIE), D. Nieva (Head of Geothermal Department, IIE), I. Herrera (Director, Institute of Geophysics, UNAM), and the members of the Computer Center, IIE. My special thanks go to my wife Terul for her support and patience.