

NATIONAL REPORT ON GEODYNAMICS (JULY 1975-JUNE 1977)
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The Mexican National Committee on Geodynamics was appointed in 1971 and some research programs were formulated as a consequence of the General Meeting of the Americas which took place in Rio de Janeiro, Brasil in 1973. The First Mexican National Report (1971-1975) deals with the approved research programs carried out by the national institutions in that period of time. On account of an extension of the period of study to 1979 for each of the Working Groups established by the ICG, the Mexican Committee decided to adjust and revise the research projects. This report summarizes the most important results and the benefits obtained during the course of investigations carried out over the last two years by Institutional members of the Committee.

Research programs at UNAM encompass:

- a) Cocos-continent plate interaction.
- b) Aspects inherent at the Pacific-Cocos-Riviera triple junction.
- c) The tectonic setting of the Gulf of Mexico.
- d) The Trans-Mexican Volcanic Belt.

Program of the Federal Commission of Electricity (CFE) and Mexican Petroleum Agency (PEMEX), are directed towards geothermal and hydro-carbun development in the counntry with their corresponding academic aspects developed at the Institutes of Electrical Insvestigation and Mexican Petroleum.

Detailed gravity studies have been made along the Pacific coast of Mexico at subduction zones, in the Trans-Mexican Volcanic Belt, and in the

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Gulf Coast Plain (Del Castillo G., 1977; Monges *et al.*, 1977). The limits of plates in the south-east of the country are complicated by regional fault systems such as those of the Polochic-Motagua at the Guatemala's border and those in the Gulf of California.

These faults represent recent lateral movements reported by geophysicists, geologists, geomorphologists and seismologists (Del Castillo, 1975, 1976 and 1977; Lomnitz, 1975; López Ramos, 1975; Lugo, 1976; Reichle, 1976; Reyes *et al.*, 1976; Schwartz, 1976). Similarly the gradients of the Bouguer anomaly in the subduction zones corroborate the subtended angle of the Benioff zone towards the Mexican continent (Del Castillo, 1977), which implies various angles of subduction in the Coco's Plate, and the corresponding seismic pattern extending towards the Gulf of Mexico (Del Castillo and Urrutia, 1975).

The magnetic survey in the Gulf of Mexico and the Pacific Ocean have provided interesting results in relation to the character of the basement and crustal thickness interpretations have been made based on geologic structures modeled on computers carried out by high velocity machines. These structures are associated with gravity and magnetic fields in zones of mineralization in geothermal fields, and in oil horizons (Bayer, 1976; González, 1976 and 1977; Mendive, 1976; Del Castillo, 1977; Flores *et al.*, 1976; Salas, 1977; Mejía, 1977; Navarro, 1977).

Professor D. Valencio from Argentina, helped to organize the Paleomagnetic Laboratory and Nuclear Geophysics Branch of the Institute of Geophysics UNAM. These investigations could provide important results concerning the magnetic poles and geochronology within the limits of the plates (National Report on Geophysics for the PIGH, 1977).

Seismic refraction studies names Project Oaxaca and Project Acapulco in collaboration with the Universities of California, Texas, and Wisconsin were completed (Del Castillo and Lomnitz, 1975). The data obtained in a profile 150 km in length along the meridian 96° - 97° W are in agreement with geology of this tectonically active portion of the country. The determined velocities show that rocks and structures in the Middle America Trench differ markedly from characteristics localized in the Mexican altiplano. The study has corroborated a thickness of 19 ± 1 km of crust for the Gulf of Mexico, of 45 km in the State of Zacatecas, of more than 25 km in the Yucatan Peninsula, combining gravity and seismological control (Del Castillo *et al.*, 1975).

Heat flow measurement (Blackwell, 1976) and data analysis under local conditions in the south-east of the country suggests seafloor spreading cen-

ters (Del Castillo, 1976) associated with earthquake swarms (Figueroa, 1976; Rodríguez *et al.*, 1976) and with the movement of the Cocos and Caribbean Plates.

The installations of RESMAC, a telemetric seismology network throughout the country, has permitted recovery of seismic information of great precision both in earthquake magnitude (Gil and Lomnitz, 1976) and in the location of epicenter (Garza and Lomnitz, 1976). Fault mechanisms are being identified when the seismological information is considered along with gravity and magnetic data.

The volcanic project of Central America, coordinated in collaboration with the Institute of Geophysics, UNAM, has progressed with the enormous help and interest of the ICAITI, an Institution that has established the Geodynamic Program of Central America with the participation of all the countries involved and neighbours like Colombia, Mexico and Venezuela due to the active communication of colleagues from Venezuela (A. Bellizzia) ICAITI (G. Dengo), Colombia (H. Caro y E. Ramírez) and Mexico (L. Del Castillo).

They have extended communication with Caribbean countries and up to now colleagues from Cuba (M. Marrero), Trinidad (J. Tomblin), Puerto Rico (J. Wever) and Curacao (D. Beets) have participated with great interest in the ICG program, in such a way that have agreed to assist in the Curacao Meeting during the coming month of July, where Dr. R. Cabré, president of WG-2, has called.

Analysis of volcanic rocks produced by partial melting of the oceanic crust in the subduction zone has been initiated by the Institute of Geology, UNAM, by means of the Department of Geology and Geochemistry. Similarly, geomorphological information has been gathered on levels of erosion in a multidisciplinary project on the active zones (Baja California, Trans-Mexican Volcanic Belt and Sonora) by the Departments of Geomorphology, Geology and Exploration in the Institutes of Geography, Geology and Geophysics, UNAM. The coordinator for these institutes are Drs. L. Del Castillo G., J. Guerrero, J. Lugo y R. López Resendez. The Quaternary program in the state of Sonora, in the Valley of Mexico, and in the state Chiapas remain included in these project at an interinstitutional level in the UNAM. Here also is included the tectonic and geomorphology interpretations of ERTS and SKYLAB satellite images (Guerra Peña, 1977, Meritano, 1977, Salas, 1976) and computer procedures (A. Guzmán Arenas 1977) in collaboration with the Consejo de Recursos Minerales. The stress distribution in the zone of metamorphic schists related to the Mesozoic dy-

namothermal event in the region of the Valley of Mexico and the ancient Peninsula of Coahuila (State of Chihuahua and Coahuila) was initiated between the Institute of Geophysics (Department of Exploration) and Geography (Department of Geomorphology) in an attempt to correlate the tectonism with zones of faulting and mineralization, such as the Mining District of Taxco, Gro., Zimapan, Hgo. and Pachuca, Hgo. Combined doctrines of geomorphology, geology and geophysics, were employed in order to know the most outstanding geodynamic processes.

Among the local technical-scientific relevant events that occurred within the last two years was the Geodynamic Sessions coordinated by the Organizing Committee of the III-Latinamerican Geological Congress held in Acapulco, Gro., in June 1976, and also the 6th Biannual Meeting of the Mexican Geophysical Union convened in San Luis Potosí in November, 1976. In the Latinamerican Congress a meeting of WG-2 took place, president ICG, Dr. M. Delany Past Secretary ICG, Dr. F. Almeida, Member of Bureau ICG, Dr. B. Baldis from Argentina, Dr. A. Bellizzia from Venezuela, Dr. J. Tomblin from Trinidad, Dr. E. Ramírez from Colombia and Prof. L. Del Castillo from Mexico. Also in Acapulco, there took place Sessions on Tectonism, Tectonophysics and Geodynamics that included 30 technical papers. In San Luis Potosí, 72 papers were presented related to various aspects of Geodynamics explorations, seismology, gravimetry, geodesy and geochemistry.

There was held a symposium organized by CONACYT, SEPANAL and CIMMPGM, on the Mexican Exclusive Economic Zone in La Paz, B. C. in August 1976 with the assistance of people connected to the Education of Sciences of the Earth, Operation and Investigation of Geology and Marine Geophysics.

The Geological Society of Mexico, the Mexican Association of Geophysical Exploration, the National Academy of Engineering and the Mexican Union of Engineering Societies have organized several conferences themes that invariable included aspects of geodynamics, and that have relevance to energy resources (oil, radioactive minerals and geothermal power), tectonophysics and the evolution of the Mexican continent.

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