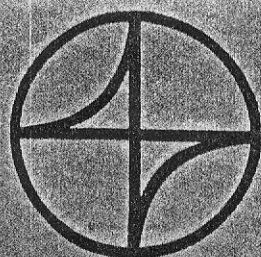


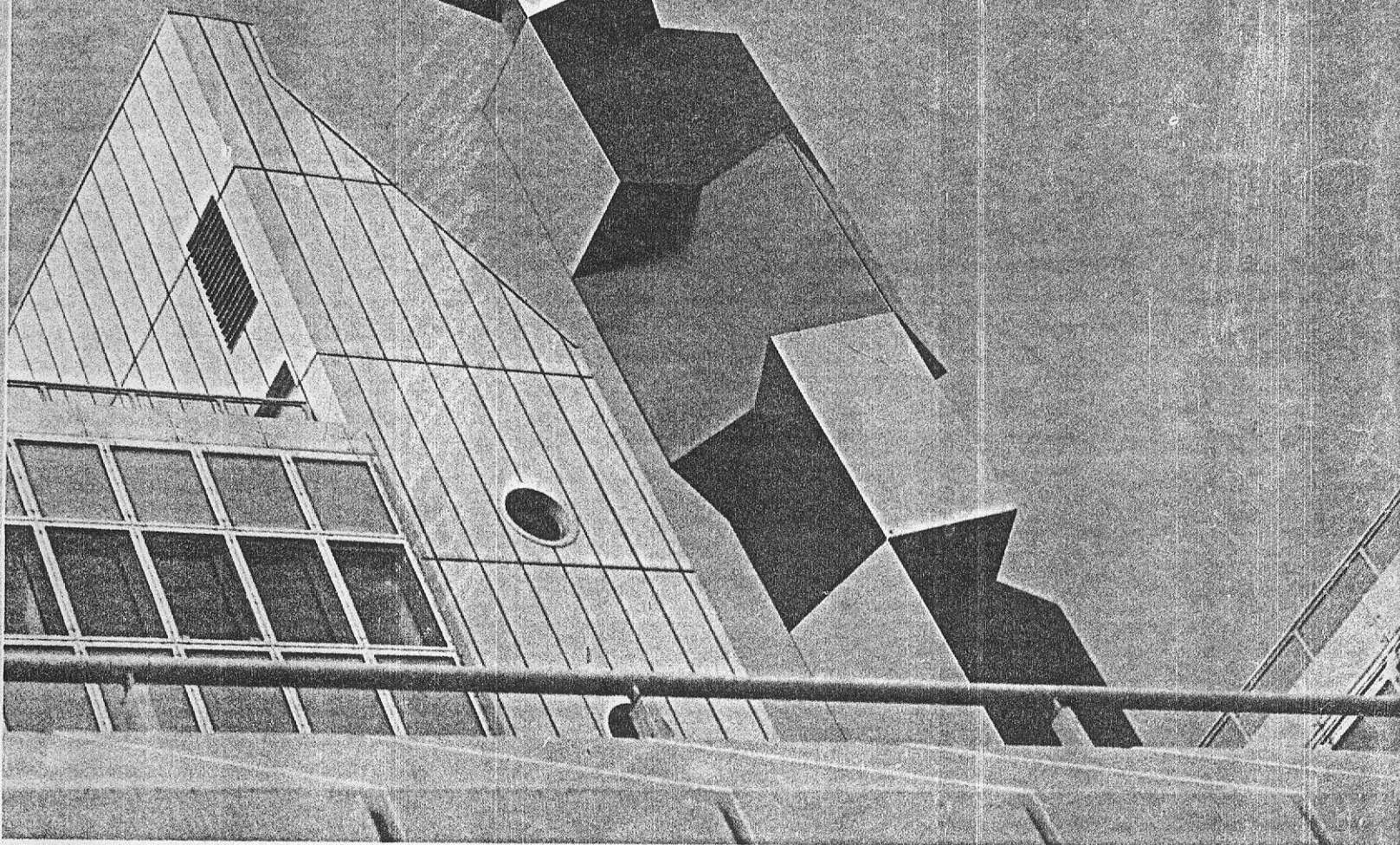
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CRUSTAL STRUCTURE IN NORTHERN MEXICO INFERRED FROM GRAVITY AND SEISMIC DATA

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The crustal structure in northern Mexico along the Tropic of Cancer has been inferred from gravity and seismic data. The transect studied covers: 1) the southernmost part of the Baja California peninsula, 2) the Gulf of California, 3) northern Mexico (Sierra Madre Occidental [SMO], Central Plateau, Sierra Madre Oriental [SMO], coastal plains), and 4) the Gulf of Mexico. Regionally, the study area is under isostatic equilibrium; a very good correlation exists between major topographic features and inferred Moho topography. Some features with wavelengths less than 50 km do not appear to be in isostatic equilibrium. For example, Sierra Azul, an alkaline magmatic body emplaced in the coastal plains, has a gravity anomaly that can be explained by intra-crustal bodies. The Moho is located at 14 and 12 km under the Gulf of California and Gulf of Mexico respectively. Here, the gravity anomaly can be interpreted in terms of oceanic crust, in agreement with the results of seismic studies. An asymmetry is observed in continental Mexico. Under the SMO, the Central Plateau, and the SMO the Moho is located at 41, 33, and 37 km respectively. Gravity interpretation of the continental crust in terms of a granitic and a mafic layer (i.e. upper and lower crust) is in accordance with the seismic structure of the upper lithosphere. We discuss the parameters used in interpreting the gravity data and the implications of the crustal structure in the context of heat flow data and of geochemical data obtained from xenoliths located in the neighbourhood of the transect.

BRUSQUE TRANSECT-FROM ATLANTIC COAST TO BOLIVIAN BORDER, SOUTHERN BRAZIL

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The transect crosses part of the South American Platform, which formed by consolidation of Archean and Proterozoic cratonic nuclei during the Brasiliano Cycle in Late Proterozoic and early Palaeozoic. The platform is overlain by the vast Palaeozoic and Mesozoic intracratonic Paraná Basin, which contains Palaeozoic and early Mesozoic sedimentary rocks, and during the Early Cretaceous was the site of voluminous continental basaltic magmatism. The basin is the dominant feature along the transect corridor and conceals much of the basement, which is exposed only at both ends of the transect corridor. The disposition and nature of the Brasiliano fold belts beneath Paraná Basin is inferred from geophysical data and extrapolation from exposures around the basin. The formation of the central and southern portion of the South American Platform apparently involved rifting and crustal extension at the beginning of the Brasiliano Cycle, followed by convergence partly involving oceanic lithosphere and resulting in juxtaposition of different continental fragments.

Several geophysical surveys have been carried out within the area of the transect. The gravity survey of southern and southeastern Brazil, completely covers the study area. Aeromagnetic surveys, carried out by different companies at different times, have a total coverage of over 60%. Geothermal data have been acquired mainly within the region of the Paraná Basin. Reflection and refraction seismic profiles are restricted to surface layers and do not penetrate the top of the basement of the Paraná Basin. Seismicity data, compiled for the whole country, are restricted mainly to macroseismic observations.

Cross-section II indicates the possible distribution of Precambrian terranes along the transect corridor, with crustal segments of different thickness, composition, and origin. In this section, orogenic events of Late Proterozoic age played the major role in formation and evolution of the South American Platform.

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