

Neotectonics at Laguna Lejia, Atacama Desert, Northern Chile.

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The location of young faults in the Central Andean Cordillera is often difficult due to the blanket of ignimbrites and other volcanic structures. Alignments of volcanic centres often indicate the presence of large fractures which channel magma in the upper crust. In the area around Toconao, near San Pedro de Atacama, lineaments of this type fall into two groups; N-S alignments which can often be traced for hundreds of kilometres, and NW-SE alignments which may be tens of kilometres long. These lineaments commonly do not correspond to any surface expression of fault movements, and many of them are probably not tectonically active.

A NW-SE lineament joins a series of domes and vents of Cerro Tumisa (approximately 2 m.y.) with a large isolated dome and a basaltic maar eruption. This lineament, the "Tumisa Line", passes under the southern margin of a small salar, or salt lake, known as Laguna Lejia. To the west of the Laguna is a large N-S lineament, the Miscanti Line. This passes through the active Volcan Lascar and a series of elongate dacite domes (5 m.y.) to the north, southwards through Cerro Lejia and Volcan Miscanti.

The southern shore of Laguna Lejia is represented by a lava flow from a nearby volcanic centre. Two distinct raised beaches can be seen on this lava. These are probably due to post-glacial shrinkage of the laguna. Sediments on the southern margin are uplifted and buckled, forming an uneven platform. A section through these consists of interbedded laminated carbonates and coarser lithic-rich siltstones and sandstones. These contain concentrations of thin carbonate tubes, representing

precipitation of carbonate around flamingo feathers which have since decomposed. At least three earthquakes are indicated by recumbent folding and disruption of the beach sediments, followed in each case by a return to laminated carbonate facies. This sequence may represent a gradual upwarping of the southern shore, interrupted by violent resubmergence during earthquakes. It is likely that the Tumisa Line has recently been the locus of earthquake activity since the last glaciation, despite the absence of a fault scarp in the area. In small salars such as Laguna Lejia, it is difficult to distinguish tectonic movements from lake level changes due to climatic effects. It is hoped that a dated section through the sediments will yield information on earthquake frequency and uplift rates.