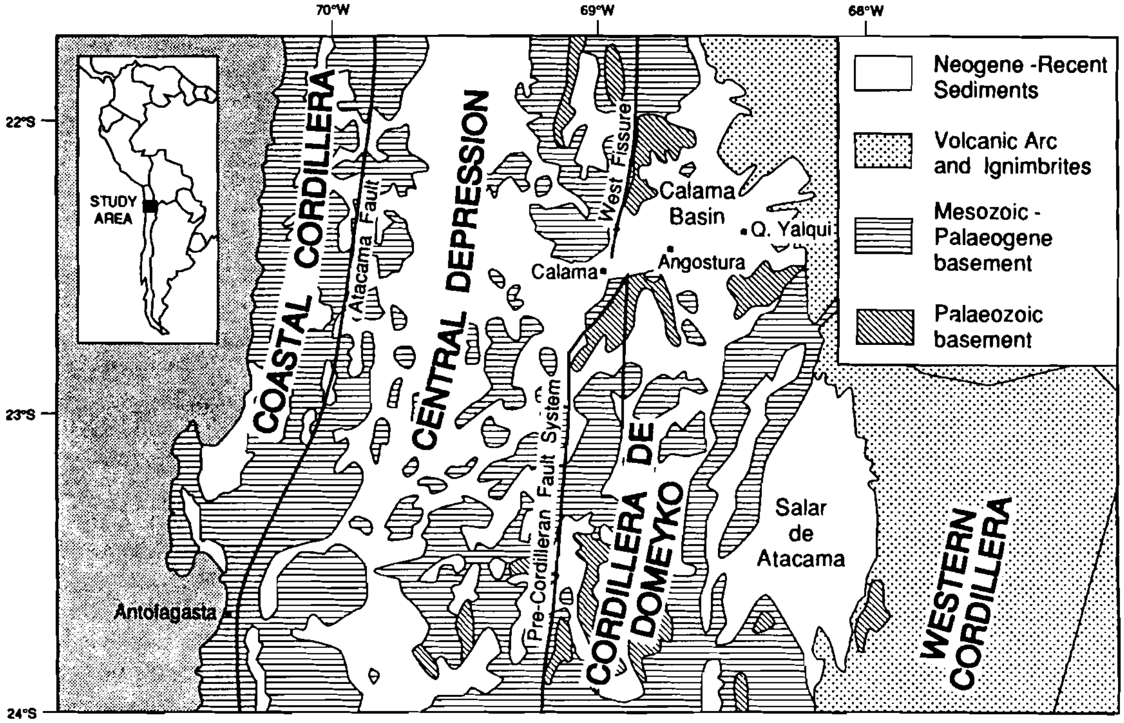

Figure 1. Location of the Calama Basin within the N. Chilean forearc.

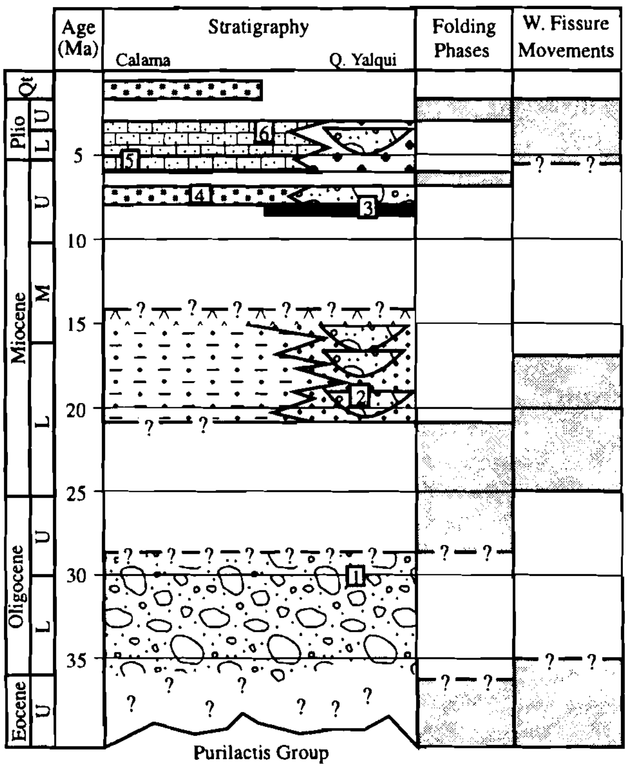

Figure 2. W-E stratigraphic section through the Calama Basin from Calama to Quebrada Yalqui (See Figure 1 for locations). The boxed numbers (1-6) correspond to the dated ash horizons shown in Table 1. The uplift and folding phases within the basin (shaded boxes) show a good correlation with dated movements on the West Fissure Fault System.

overlain by approximately 100 m of fluvial and playa sediments. An ash towards the base of this sequence has yielded an age of 19.62±0.36 Ma placing sedimentation within the Lower Miocene. An upper age is uncertain but the development of thick gypcretes suggests a significant time gap prior to resumption of sedimentation in the Upper Miocene. The Upper Miocene to Recent stratigraphy comprises 3 unconformable successions (May *et al.*, in review). Between 8.3 and 7 Ma 30 m of alluvial fan sediments, passing basinwards to lacustrine diatomites were deposited. These were locally folded prior to the deposition of up to 85 m of palustrine carbonates between 6 and 3 Ma. A widespread episode of folding followed, before the deposition of 20 m of localised Quaternary(?) fluvio-lacustrine sediments.

Phases of uplift and deformation within the basin are constrained as occurring during the upper Eocene, upper Oligocene-lower Miocene, upper Miocene and upper Pliocene. The cessation of sedimentation during the middle Miocene is presumably related to the regional change to hyper-arid conditions at this time (Alpers & Brimhall, 1988) and not tectonic uplift as the strata are conformable with overlying successions.

DISCUSSION AND CONCLUSIONS

The onset of sedimentation during the lower Oligocene is mirrored in sediments of the Paciencia Formation in the Salar de Atacama Basin (Kape, 1996) and the Sichal Formation in the Central Depression (Jensen, 1992). Therefore, subsidence following the end of the Eocene Incaic phase of Andean deformation is seen across the forearc of the region. Phases of deformation on the West Fissure system (Fig. 1) occurred as dextral strike-slip during the Eocene (Reutter *et al.*, 1993), sinistral strike-slip during the lower Miocene (25-17 Ma: A. Tomlinson, pers. comm., 1995) and as post upper Miocene transpression. These tectonic phases correlate well with the observed deformation, and subsequent sedimentation, periods within the Calama Basin (Fig. 2).

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