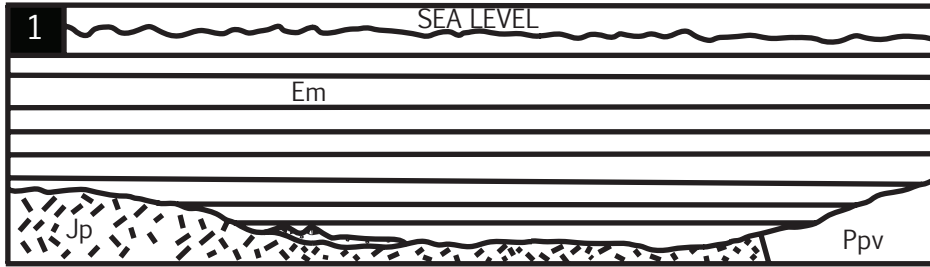
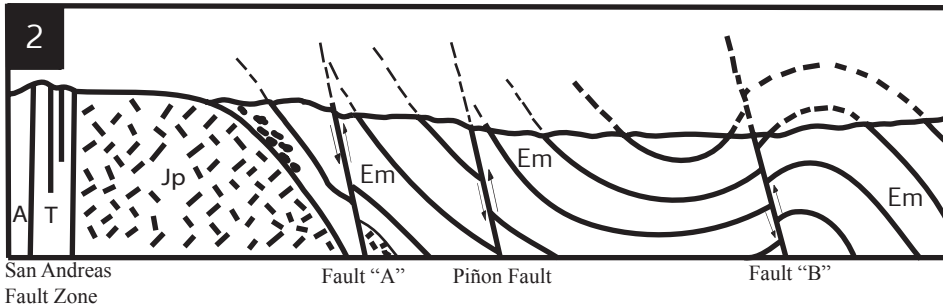


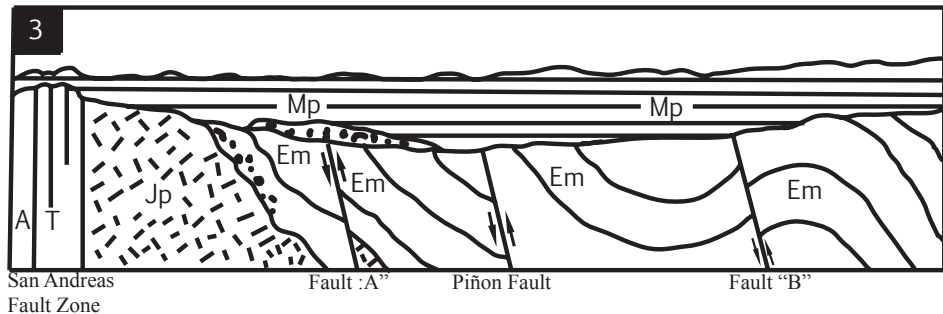
Geology of the Devil's Punchbowl



About sixty million years ago a basin was formed beneath a shallow ocean in the Devil's Punchbowl area. The ancient basin was bordered on the north by a granitic body of rock that is now exposed on the Piñon Ridge (Jp), the southern border of the ancestral San Gabriel Mountains. This southern portion of the basin was underlain by a rock body called the Pleasant View Complex (Ppv). Sand and silt from the land mass to the south were deposited in the basin forming the San Francisquito Formation (Em). Large boulders (up to 10 feet in diameter) tumbled into the lower bed of the basin from the Piñon Ridge Complex. Later deposits in the San Francisquito Formation extended over the Piñon Ridge highland to the north. The ocean retreated and the exposed rocks were eroded.

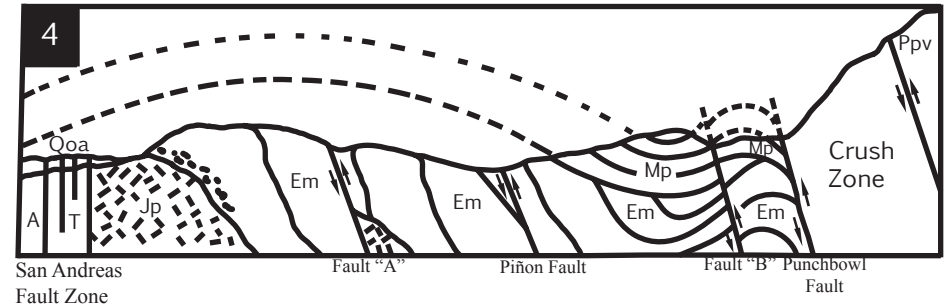


The movement pictured on the faults occurred between forty and sixty million years ago. The Piñon Fault and Fault "B" folded the San Francisquito Formation while Fault "A" cut the Piñon Ridge complex as well as folding the San Francisquito Formation. These faults are called "reverse faults" because of the direction in which the blocks of rock moved (arrows indicate direction). Activity on the San Andreas Fault, a right-lateral fault, also occurred. One block (A) moved away to the east in relation to the block (T) that moved to the west. The area was further eroded.

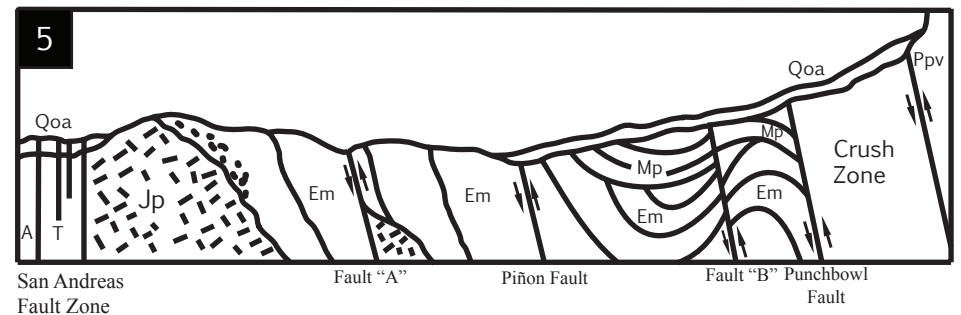


The sandstone of the Devil's Punchbowl Formation (MP) was deposited about thirteen million years ago. Like the San Francisquito Formation, the Punchbowl Formation was deposited into a basin. This basin, however, was not underwater, but was filled by terrestrial stream deposits flowing from the north and west. Large pieces of the San Francisquito Formation were stripped away from the hills and deposited in the lower beds of the Punchbowl Formation. This rock deposit is called mega-breccia. Many layers of Punchbowl Formation sediments were deposited, some extending north over the Piñon Ridge Formation.

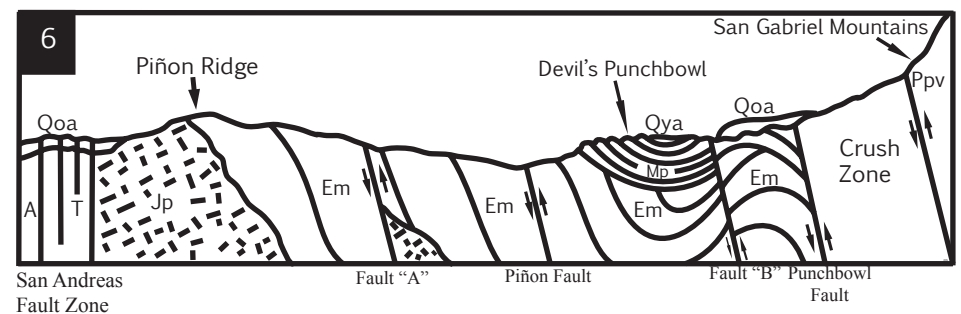
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Vertical movement on the Punchbowl Fault raised the San Gabriel Mountain block (Ppv). It took more than a million years to accomplish the vertical relief seen today. Renewed movement on fault "B" folded the Punchbowl Formation, while streams deposited older alluvium (Qoa). During this time there was also right lateral movement on the Punchbowl Fault, breaking and crushing the surrounding rock and creating what is called the "crush zone". The broken lines extending over the basin depict what the Punchbowl Formation looked like before erosion.



Sediments eroded from the San Gabriel Mountains were deposited in a low-lying slope (Qoa) that extended over the Devil's Punchbowl area. Movement on the San Andreas Fault and deposition of older alluvium (Qoa) by streams continued.



Most of the low-lying older alluvial deposits (Qoa) have been cut away from erosion, leaving remnants of older alluvium. The Nature Center is located on one of these remnants. Present streams have deposited younger alluvium on the basin floor. The Devil's Punchbowl is a fascinating display of geological forces. Continuous faulting and erosion have been the major forces in creating the impressive structure now seen in the Devil's Punchbowl.