



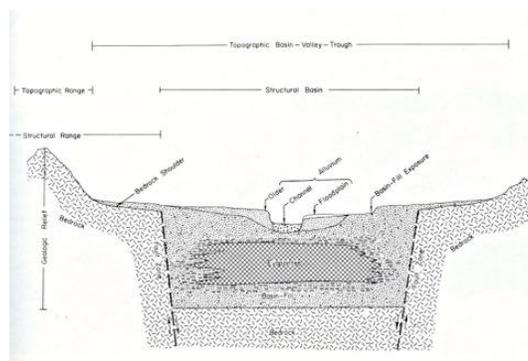
## Arizona Rocks 20

Text and photos by Ray Grant

We are looking at the chemical sedimentary rocks, those rocks that form from elements that go into solution during weathering. The two most abundant elements in solution are calcium (forms limestone) and magnesium (forms dolostone). The other major elements in solution which form rocks are sodium and potassium. These two elements along with calcium form a series of rocks called evaporites that form from the precipitation of salts from solution by evaporation.

The rocks that form are rock salt composed of halite (NaCl) and sylvite (KCl), gypsum or gypstone ( $\text{CaSO}_4 \cdot 2\text{H}_2\text{O}$ ) and anhydrite ( $\text{CaSO}_4$ ). Halite, gypsum, and anhydrite are very common in Arizona, but rarely seen. That is because they formed during the early period of the Basin and Range formation from 15 to 3 million years ago. At that time many of the basins in Arizona looked like Death Valley does today. The basins were down faulted and the water collected in them and evaporated. More recently, as rivers connected the basins together the evaporites were covered with deposits of sand, gravel, and mud. Almost every basin has some evaporites present when there is drilling deep enough to find them. The Luke Basin by Luke Air Force Base has over 3,000 feet of halite that was found starting at 1,000 feet down. The halite is being mined there by dissolving it in hot water and pumping the solution to the surface. In the Picacho Basin by Eloy anhydrite over a mile thick was found about 2,000 feet down. One place to see evaporites is at the Verde Salt mine outside of Camp Verde. The halite and other minerals formed when a lake was present in the Verde Valley.

Collecting halite at the Verde Salt Mine



Idealized cross-section showing the evaporites in the basins of southern Arizona



Salt forming from evaporation in Death Valley, California at the present time. Many basins in southern Arizona looked like this in the past.

Halite crystals from Searles Lake, California

