SALT-DOME STRUCTURE
(PRELIMINARY NOTICE)

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At the invitation of the research committee of the American Association of Petroleum Geologists, the writer had an opportunity, in August, 1946, of making a brief inspection of the salt mines in the Hockley, Grand Saline (Texas), Winnfield, Jefferson Island, and Weeks Island (Louisiana) salt domes. The purpose of the visit was to examine the feasibility and desirability of a structural investigation of some salt domes. This note describes some of the structural features seen and points out some related geological problems.

Megascopic structure.—The salt in all five mines shows a layered structure of white and gray salt. White salt is almost pure halite; gray salt contains a small proportion of anhydrite and, rarely, a few additional compounds. Salt layers vary in thickness from a fraction of an inch to several feet; white salt seems far to exceed the amount of gray salt. Layer boundaries, sharp from the distance, are elusive in hand specimens, and salt crystals, about \( \frac{1}{2} \) cubic inch in size, may grow across layer boundaries. Most grains seem to be equant, and the texture of the salt is compact, but in a few places distorted halite crystals were seen in crude alignment, resembling the structure of coarse-grained gneisses.

Folds.—On vertical walls of the mines, salt layers stand in nearly vertical position. Dip angles as low as 45° were noted in places, but seem to be the exception rather than the rule. In sharp contrast with this rather monotonous succession of steep salt layers on the walls is the salt structure in the ceilings. Here a remarkable array of folds is exposed in cross section. Their axes are nearly vertical so that the observer looks nearly parallel with them, and the horizontal ceilings are cross sections of the folds. Large folds must be traced through contiguous tunnels and rooms, but under favorable conditions they can be followed for hundreds of feet. Smaller folds are completely exposed within individual room ceilings (Fig. 1). There are open folds as well as isoclinal folds. Many limbs carry smaller secondary, and even ternary, folds, and tightly appressed shear folds are common among these. How far individual folds can be traced will depend on the orientation of the mine tunnels and also on the persistence of salt layers. As in folded marbles, dark salt layers tend to lens out, and may be lost even where ceiling exposures continue.

Looking up at places where several groups of limbs have been kneaded into

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