

a colony, which has somewhat the appearance of a clump of moss. When the colony dies, the calcareous tubes are often fossilized, becoming a permanent part of the reef. The presence of these, and of the sponges fossilized in growth position (rather than inverted or scattered about), shows that the Capitan reef did actually grow in its present position, rather than having been built out of sediments washed in from elsewhere.

As geologists studied the drilling records and seismic surveys of the Capitan area, the immensity of this ancient underground organic bank became evident. It is buried beneath parts of 7 counties of Texas, and 2 of New Mexico, forming almost a complete circle. (See Figure 17 for its position and extent.) This reef is situated as a relatively narrow band around the rim of a great underground depression, which is known as the Delaware basin. This basin is approximately 90 miles wide and 160 miles long, being somewhat oval in shape, with one end of the oval protruding northward into New Mexico. Most of the basin is now covered with several thousands of feet of sedimentary rock layers, which must be penetrated by the oil drillers to reach the oil-bearing layers of the depression, and of the reef which lies around the edge of it.

Near the northern end of the basin, parts of the reef project above the level of the basin itself and have now been exposed by erosion in some of the canyons of the Guadalupe Mountains. The famous Carlsbad Cavern is actually in the ancient Capitan reef (that is, the cavern is an underground area of the reef limestone which dissolved away). However, the eastern parts of the reef are buried much deeper than in the Carlsbad area, apparently because that side of the basin sank considerably before the final covering process took place. By using drilling records, petroleum geologists have now learned the exact position, thickness, and depth of nearly all parts of the reef, as well as its composition. The total length of this structure, as it extends around the Delaware basin, is slightly over 350 miles.³ In ancient times this bank was growing in the shallow water around the edge of the basin, which contained sea water at that time, and was probably an actual part of the ocean. The reef itself has a total thickness of more than 1,200 feet in some places, but in other places is as little as 400 feet thick.⁴ There is now an abundance of underground maps of the basin and of the Capitan reef which surrounds it. These maps show both the lateral extent and the thicknesses of these structures. (Figure 18, to which we will refer later, is a portion of one of these which is designed to show thicknesses.)

Length of Time for Growth

In Chapter 3 we saw that growth rates of coral reefs are very slow, and that even in the most favorable latitudes in the Pacific, reef-forming organisms add only approximately one-third of an inch of thickness per year. In the case of the Capitan reef, many of the same kinds of organisms are present, but the fact that only a small percentage of them are corals is an indication that growth of this reef-like bank was slower than that of a true reef. Even