

carbonates and several forms of gypsum and anhydrite. Some of the anhydrite was in the form of nodules such as have been recently described on the desert coasts of Arabia. Finally, oil geologists began to study desert coasts as a possible aid in interpreting the above mentioned underground series of sediments.

On the Arabian side of the Persian Gulf, near the southern end of the Gulf, is a shallow-water coast line where the water temperature is very often above 90° F. (sometimes above 100°), and evaporation takes place at a rapid rate. This 200 mile long area is known as the Trucial Coast, and is studded with a series of low islands a few miles off shore, which restricts the circulation of water in the long lagoon which lies between them and the shore. Corals and other tropical marine organisms form a great deal of carbonate (limy) sediment which is deposited in the lagoon and on the shore. Evaporation along the shores leaves layers of anhydrite and salt during most of the year, and salty mud flats abound. (See Figure 15.)

All in all, the Trucial Coast is an inhospitable place to set up a research station. Nevertheless, by 1963, petroleum geologists had combed the salt-covered beaches and flats, taken hundreds of shallow sediment cores and other samples, and had solved many of the mysteries about that area. It soon became evident that several of the mysteries of the underground strata in the oil fields in various parts of the world could be solved by relating them to the environments of the Persian Gulf's shores. Further research on the Trucial Coast by numerous other petroleum geologists bore out the truth of this discovery.

In the preceding parts of this chapter we described some of the evaporite sediments which cover the reefs in the oil fields of Alberta. In the upper parts of those covering layers (no. 3 of Figure 14) are several repeating series of sediments which have much the same order, texture, and chemical content as the layers on the Trucial Coast. The underground strata can now be much better understood and traced because a modern desert-shore environment, in which the repeating series was produced, has now been studied and described. This has enhanced oil exploration, not only in Canada, but in other parts of the world where these series of sediments are found. Since the salty mud flats along the Trucial Coast are given the Arabian name "sabkhas," this is the name by which such a series of deposits is called, even when discovered at great depths in oil wells.

The Sabkhas of the Persian Gulf

A modern sabkha, such as is seen on the Trucial Coast, is a salt-encrusted flat, lying a short distance inland from the usual water's edge. It is at an elevation just above the high tide, except that it is flooded over occasionally due to higher water resulting from storms. These inundations supply salt water which, when evaporated, adds to the sabkha's thickness. Also, there is some lateral seepage of salt water from the shore inland. In some places these "coastal sabkhas" are rather wide, extending inland