

oil-bearing strata of many parts of the world is thus a record of the sea coast growth of the algae, and of the formation of algal mats.

The Present as a Picture of the Past

The reason we have considered the process of sabkha formation in some detail is that processes very similar to this were going on along numerous ancient arid coasts. In fact, the layers of evaporite coverings which lie above the Canadian reefs often contain not only one sabkha series of layers, but several. This is a strong indication that there was enough change of environment at various times during the burial of the reefs, that a whole new sabkha layer series was formed on top of the old.

Since sabkhas on our modern coasts are often several miles in width, it is not surprising that the ancient ones likewise cover broad areas. In the Rainbow oil fields of northwestern Alberta, wells drilled into and around one of the large atoll reefs passed through a set of 20 recurring sabkha-type cycles. Some of them are continuous for a distance of more than six miles across and beyond the reef. (Their layers can be matched from well to well.) Actually, these sabkha-type layers are widespread in Alberta, being found at least as far north as the Zama area oil fields (60 miles north of the large atoll reef mentioned just above), and also in the oil and gas fields much farther south.³¹ Evidently the sea had dried up in various parts of the area, giving opportunity for the sabkhas to form along the edges of the remaining bays and lagoons. J. G. Fuller recently observed and described a series of 13 sabkha cycles in 50 feet of core from a well near Calgary, Alberta.³²

In the study of the cycles in the Rainbow area, Bebout found that each cycle usually has a thickness of from two to four feet. Those cycles which are complete are made up of four zones or layers which are similar to the zones of the modern Trucial Coast deposits. (See Figure 16 for a drawing of these, accompanied by a description of the contents of each zone.) The cycles recur, one upon another, their combined thickness in the Rainbow area being approximately 150 feet, including some layers of salt. In most of the cycles the sediment-laden algal mats of the ancient coast were converted to laminated dolostone, which lies in the lower part of the cyclic deposit. Some of the cycles are incomplete, having one or another of the four zones missing.³³ However, this is to be expected, since the natural changes of climate which have occurred in the past could easily alter the sedimentation processes which were going on in the sediments of the salt flats.

Immediately above the series of 20 sabkha cycles are 15 more cycles which are similar, but less complex. These are made up of two main components: nodular anhydrite layers alternating with dolostone. Their total thickness is somewhat more than 100 feet.³⁴ It should be noted that nodular anhydrite such as this (with large nodules) is a very reliable indication of coastal deposition. These nodules form at or very near the surface of the salt flat