one-tenth of the original is reached (if evaporation continues to that extent), ordinary salt (NaCl) begins to precipitate. These relationships are shown in Table 1. The fact that these three minerals each precipitate out at such definite, but widely differing, brine concentrations provides us with an unusually good opportunity to learn some of the past conditions under which laminated sedimentary deposits were formed. In other words, when we see layers of precipitated calcite and anhydrite, we know that the water which precipitated the calcite was not as concentrated as later on when the anhydrite layer just above it was produced. Likewise, if there is a layer of common salt just above the anhydrite, this shows that the brine became at least ten times as concentrated as normal sea water.

In the case of the laminated deposits around the reefs, the water did not usually reach sufficient concentration to precipitate common salt. However, in the layers higher up, there are relatively thick beds of salt alternating with thin layers of anhydrite, in the oil fields to the east of the Rainbow area.[23]

Summarizing the Significance of Microlayers

A close examination of the thin mineral layers in the basin in the Rainbow area reveals important information about past conditions there. First is the recognition that, since there are several thousands of these alternating layers, there obviously had to be a radical change of concentration of the sea water from low to high, and back, recurring many times. We need also to remember that there is no doubt that many of the times of low salt concentration were sufficiently dilute for marine animals and plants to grow. Otherwise they could not have left fossilized remains sealed beneath the precipitated layers. (Organic materials can not be produced from sea water without life, for the sea water is only a mixture of inorganic elements and compounds.) Then, on the other hand, we have to recognize the reality of periods of high salinity caused by a gradual evaporation from the surface of the sea; for there is no other known or conceivable way by which the orderly series of mineral laminations could be produced.

Of interest also is the fact that strata of soluble salts such as anhydrite and common salt could not have been formed in the presence of moving water. There must be reasonably long, quiet periods for undisturbed settling of the precipitating salt; and besides that, moving water would only redissolve what salts had been precipitated.[24]

When Davies, and also some earlier geologists who had studied these laminated deposits in Canada, investigated the similarity of the individual microlayers at any particular depth in the ancient basin deposit, they found further evidence of the orderly and uniform deposition process which we have been describing. This evidence consisted of the fact that particular sets of couplets of microlayers could be recognized and identified in the drilling cores of two or more wells located at various distances from each other. This shows the remarkably quiet condition of the sea bottom at the