effectively reduce the magnesium content of the water before the more isolated parts of the sediment mass are reached. Furthermore, the process of ion exchange in the conversion can occur only as the ion-carrying water penetrates and circulates through the sediment grains themselves. This is true, whether the process of dolomite formation is occurring in a submarine location, at the tide level, or above the tide level. Even though there are elements of doubt and disagreement among geologists concerning the details of formation of the ancient deposits of dolostone, there is an almost universal agreement on the necessity of circulating, magnesium-carrying water and ion exchange.

A related process which we must recognize in connection with the conversion of carbonate sediments to dolostone is that of dolostone cementation. By means of this process cement crystals are formed in between the grains of sediment, either after or as the grains are converted to dolomite. The crystals of mineral cement are precipitated from the water which circulates between the grains. Some of these crystals in a mass of dolostone are composed of calcium carbonate, and others of dolomite, depending on the environmental conditions at the time of their formation. Also, a great many of the grains themselves, for example fecal pellets, have internal cement crystals built into them, as was mentioned earlier in this chapter. The cement crystals, both inside of dolostone grains and between the grains, can be observed with a high-magnification petrographic microscope. They are often arranged in beautiful, symmetric patterns.[21]

All of this of course leaves us with the realization that there is no possible way of forming fossiliferous dolostone in a rapid manner, and that large amounts of time have been involved in producing such dolostone deposits. The laws of solubility, dissolution, and ion exchange which God established have been stable since the time of their creation, as have his other physical laws. Thus, our discovery that large sections of the stratigraphic column in the Bahama Banks are composed of dolomitized, biologically formed sediments is one of the proofs that the Banks were formed very slowly, on their present location. Similarly, within many of the deep layers of dolostone in the oil fields, the presence of cemented pellets, oöids, animal fossils, and algal-mat layers in growth position, show us that long periods of time were required for the formation of those deposits.

FOOTNOTES

1. It is likely that inorganic precipitation contributes some to the building process, though not as much as was formerly believed.

2. L. V. Illing, "Bahaman Calcareous Sands," American Association of Petroleum Geologists Bulletin, v. 38 (1954), p. 24-25.

3. The usage of these terms is not uniform in the geologic literature. We will try to use them as outlined by Curt Teichert