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Two chapters by R.B. Frankel and D.A. Bazylinski discuss biologically induced and biologically controlled Fe and Mn mineralization by bacteria. Examples of the former are some Fe sulfides and the 'rusticles' draping the wreck of the *Titanic*, while the latter are the magnetotactic bacteria. Just because these processes involve prokaryotes does not mean they are simple, and the dramatic deterioration of the *Titanic* shows how fast they can operate.

J.R. Young and K. Henriksen describe in detail the crystallography, morphology and process of calcite skeleton formation in coccoliths, tiny but elaborate and highly controlled algal constructions. Similarly, C.C. Perry's chapter on silica biomineralization starts with structural chemistry of SiO_2 and techniques of study, and proceeds to a discussion of sponge spicules and diatoms and the specific proteins thought responsible for silica nucleation. Silica is also precipitated by radiolarians, silicoflagellates, horsetails and grasses.

Animals have obviously devised the most varied and intricate tricks in the biomineralization trade. Invertebrates take the stage in two papers, one by J. Erez on the foraminifera and another by A.L. Cohen and T.A. McConnaughey on scleractinian corals. Erez focuses on recent observations about rates of calcification and fine-scale variations in trace-element composition — geochemists take note! He reports ingenious experiments whereby decalcified specimens are monitored as the cell reconstructs the test. The chapter on corals shows amply why these skeletons are valuable repositories of paleoclimatic information because their rapid growth permits even daily fluctuations in biomineralization rate to be discerned. Cellular processes and the complexities of stable-isotopic composition are reviewed. In both these chapters, the widely held assumption about the primary role of photosymbionts is dispelled: they do not simply enhance the rate of calcium carbonate biomineralization by removing CO_2.

Shell secretion in molluscs has received a great deal of attention in the past. Here, it is dealt with in passing by A. Veis as part of a chapter on compartmentalized precipitation mediated by the collagen matrix in vertebrates. He describes the composition and morphology of collagen molecules and fibrils, how certain proteins induce crystal nucleation, and then how bones, teeth and otoliths are formed.

The lengthy bibliographies attest to the dynamism of the biomineralization field, straddling as it does the domains of geology, biology and chemistry. Technological advancements have obviously paved the way for spectacular improvements in understanding. The next frontier is to assemble the genomic sequences in biomineralizing organisms in order to elucidate the genetic controls on the biochemical processes and how variations manifest themselves in different taxa. This is an excellent book, bursting with information, much of which is quite beyond this reviewer. I can, however, appreciate the majesty of biomineralization in the history and workings of Earth, and marvel at its wondrous artistry I see under the microscope.