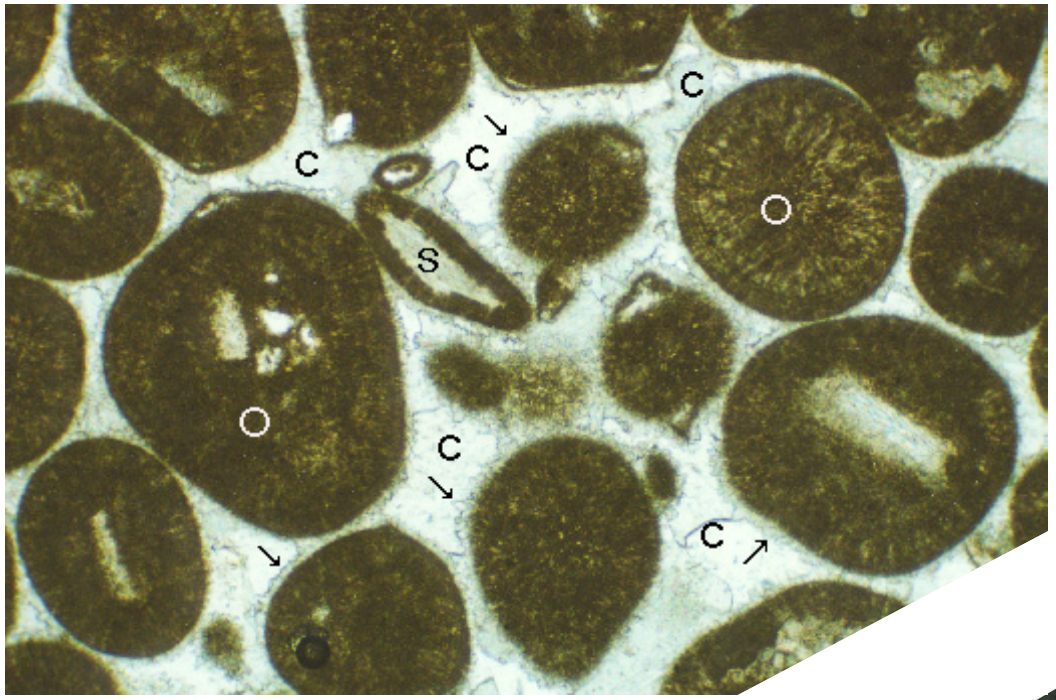
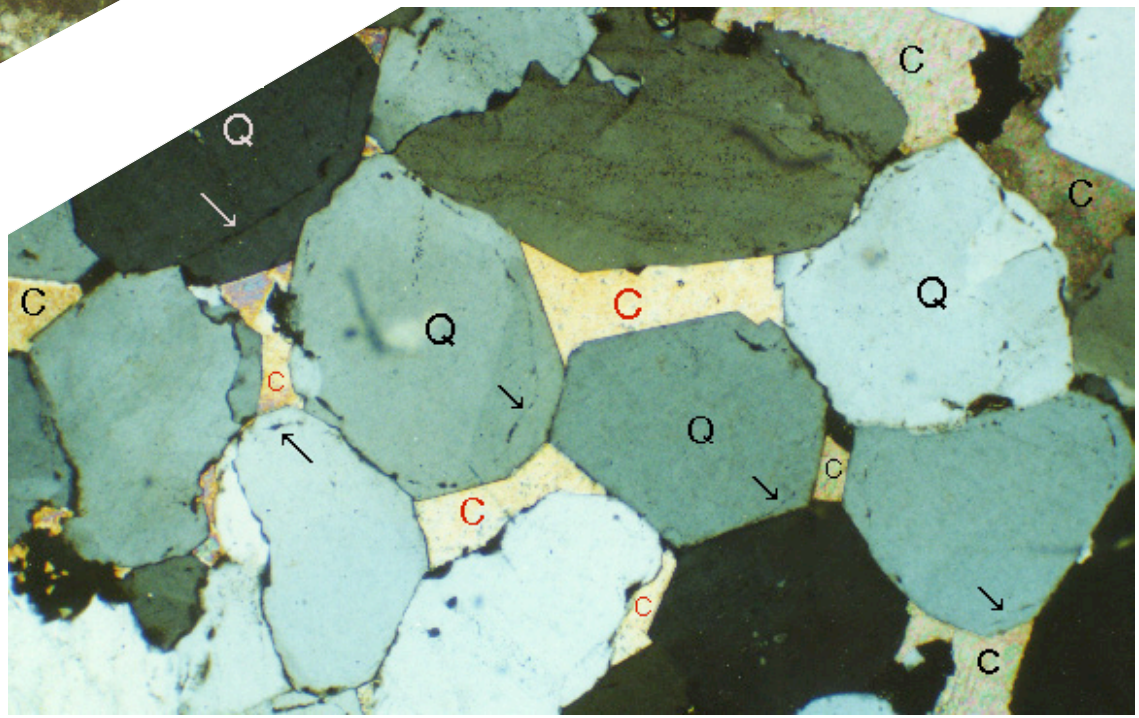
Lithification of sediments to form sedimentary rocks, Part IV: Cementation



Left: An oolitic limestone (specifically, an oolitic grainstone) with calcite cement. Grains are ooids (O) and skeletal grains (S) with oolitic coatings. Note abundant small crystals of early cement (arrows) that have grown from the edges of pores. The ooids consist of innumerable small calcite crystals that provided lattices from which pore-rimming cements grew. In contrast, the center of each pore is filled with only one or two large calcite crystals (C).

Photomicrograph was taken in parallel-polarized light (polarizer parallel to analyzer); field of view is 2.0 mm wide.Sampleis a Jurassic grainstone from near the Tunnel du Legionnaire, Ziz Valley, High Atlas Mountains, Morocco.



Right: A calcite-cemented sandstone (specifically, a quartz arenite). Well-rounded quartz grains (Q) have euhedral quartz overgrowths beyond their original grain edges (arrows). Calcite (C) has filled remaining pore space. Four areas with red "C"s are all one crystal (a poikilotopic crystal) that has grown through pore throats into multiple pores. Note that quartz cementation took place without the nucleation of any new crystals: all the quartz cement is overgrown on the pre-existing lattices of the quartz grains. Four areas labelled with red "C"s were filled as the result of one calcite nucleation. This tendency to precipitate minerals with minimal nucleation of new crystals is typical of groundwaters that are not highly supersaturated with respect to the precipitating phase.

Photomicrograph was taken in cross-polarized light; field of view is 2.3 mm wide. Sample is from the Mesozoic of South America and was donated by Dr. Gilles O. Allard.