Biomineralization and deposition of gold in Lower Proterozoic paleoplacers

D.J. Mossman
Mount Allison University, Sackville, N.B. E0A 3C0

The geochemically most influential life processes in the biosphere have always been carried on by microorganisms. Numerous life forms, advertize their existence past or present, through the phenomenon of biomineralization. The term biomineralization includes processes whereby metals and/or metal compounds are accumulated in living systems. The lower Proterozoic was the age of prokaryotes, single celled microbacteria lacking cell nuclei, able to precipitate minerals through "biologically-induced" processes. Present day prokaryotes are capable of actively concentrating gold to the extent of several percent. A similar gold concentrating process evidently functioned during the formation of the South African Witwatersrand gold-bearing conglomerates. There, kerogen derived in part from prokaryotic microorganisms accounts for a substantial portion of that country's gold production. The results of preliminary work indicate that thucholite, a kerogen-like substance of possible syngenetic origin from the Huronian Supergroup of Canada, is also commonly anomalously enriched in gold. The likelihood of discovering Witwatersrand-type paleoplacer gold in Canada is thus increased.