

Stalagmites of CaCO_3 as records of past environmental/climatological change

Geochemical evidence:

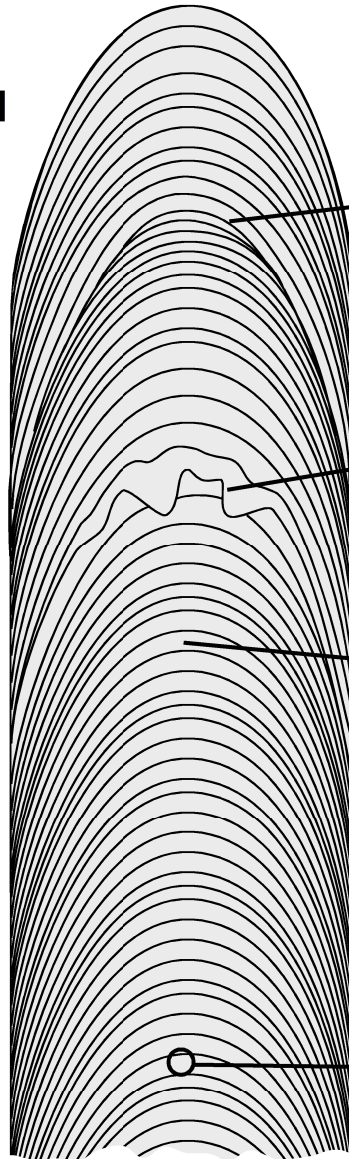
Datable by U-series (U-Th) method
(and by radiocarbon)

Two polymorphs of CaCO_3 ,
calcite and aragonite, that
form in differing environ-
mental conditions

CaCO_3 , with easily-determined
stable isotope ratios of oxygen
($\delta^{18}\text{O}$) suggestive of changing
vapor sources, amount of pre-
cipitation, and atmospheric
temperature

CaCO_3 , with easily-determined
stable isotope ratios of carbon
($\delta^{13}\text{C}$) suggesting changes in
extent and nature of vegetation

CaCO_3 , with substituting
cations (e.g., Mg) that are
environmentally sensitive



Physical evidence:

Layer-bounding surfaces:

Type L surface, resulting from
lessened deposition and
representing exceptionally
dry conditions

Type E surface, resulting from
dissolutional erosion and
representing exceptionally
wet conditions

Layers, the thickness and/or
width of which may be
proportional to rainfall

Sequence, commonly layered,
that represents a time-series
of information

Pollen, dust, or other sedi-
mentary materials that may
be proxies for past climate.