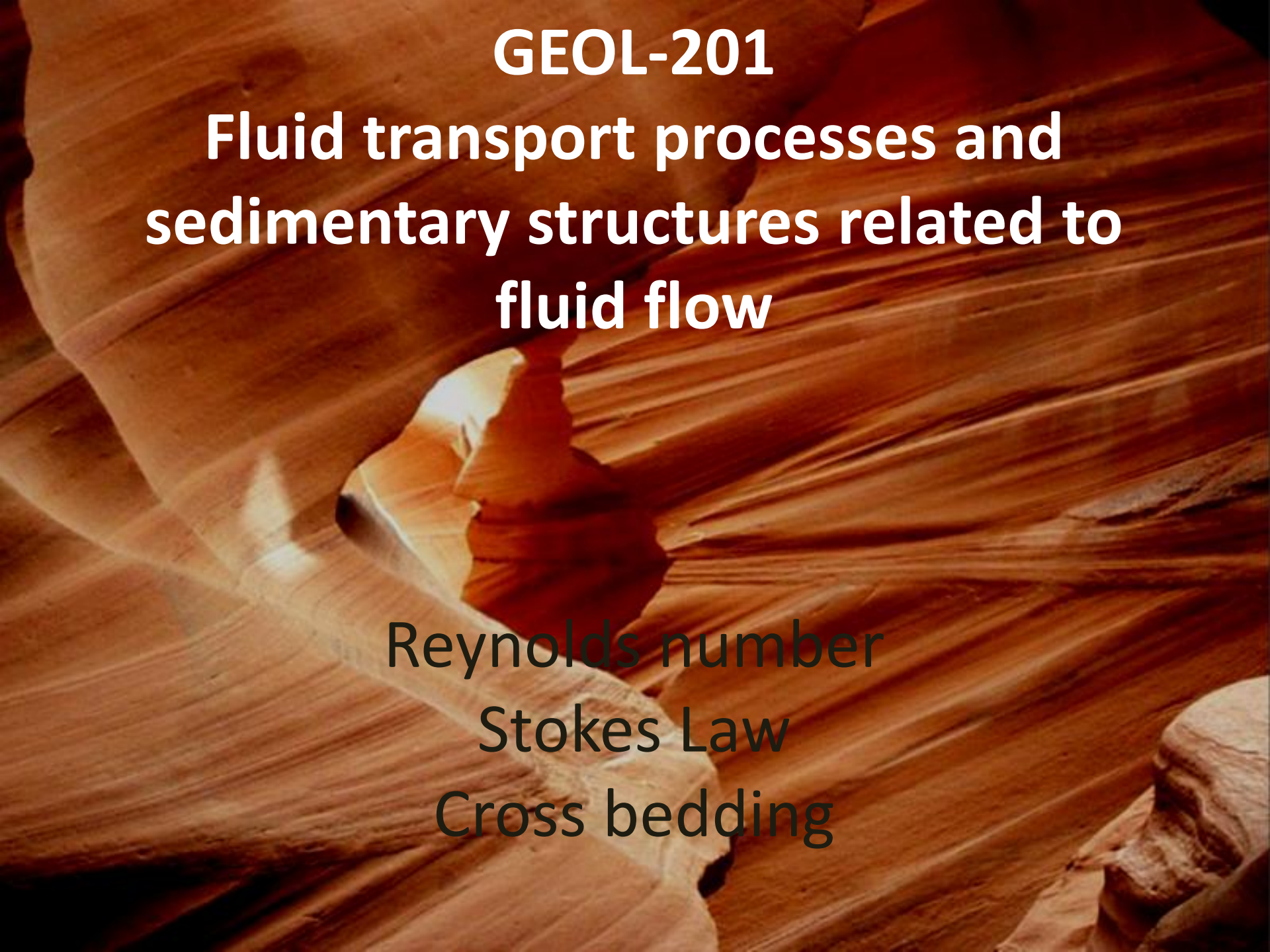


GEOL-201
Fluid transport processes and sedimentary structures related to fluid flow

Reynolds number
Stokes Law
Cross bedding

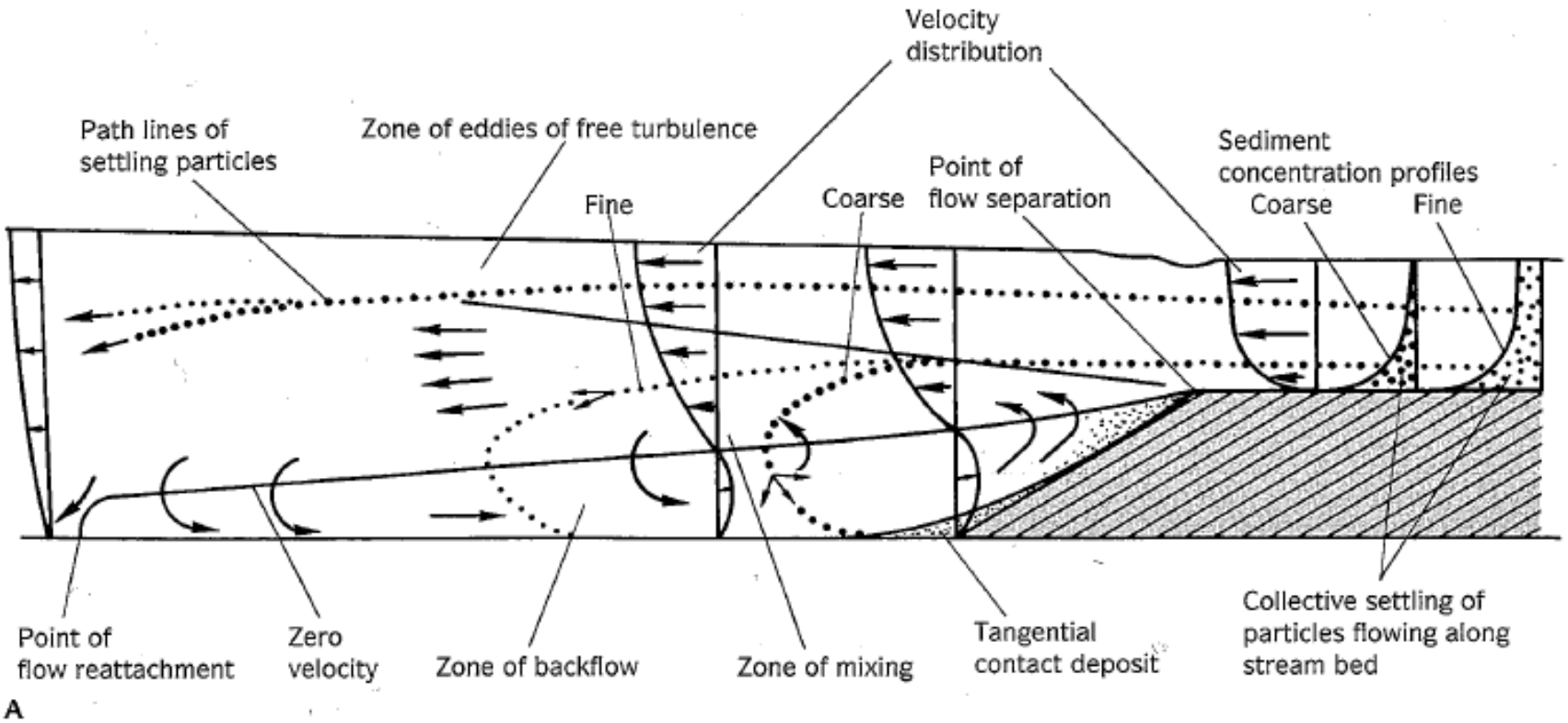
Reynolds number

Predict the behaviour of flowing fluids

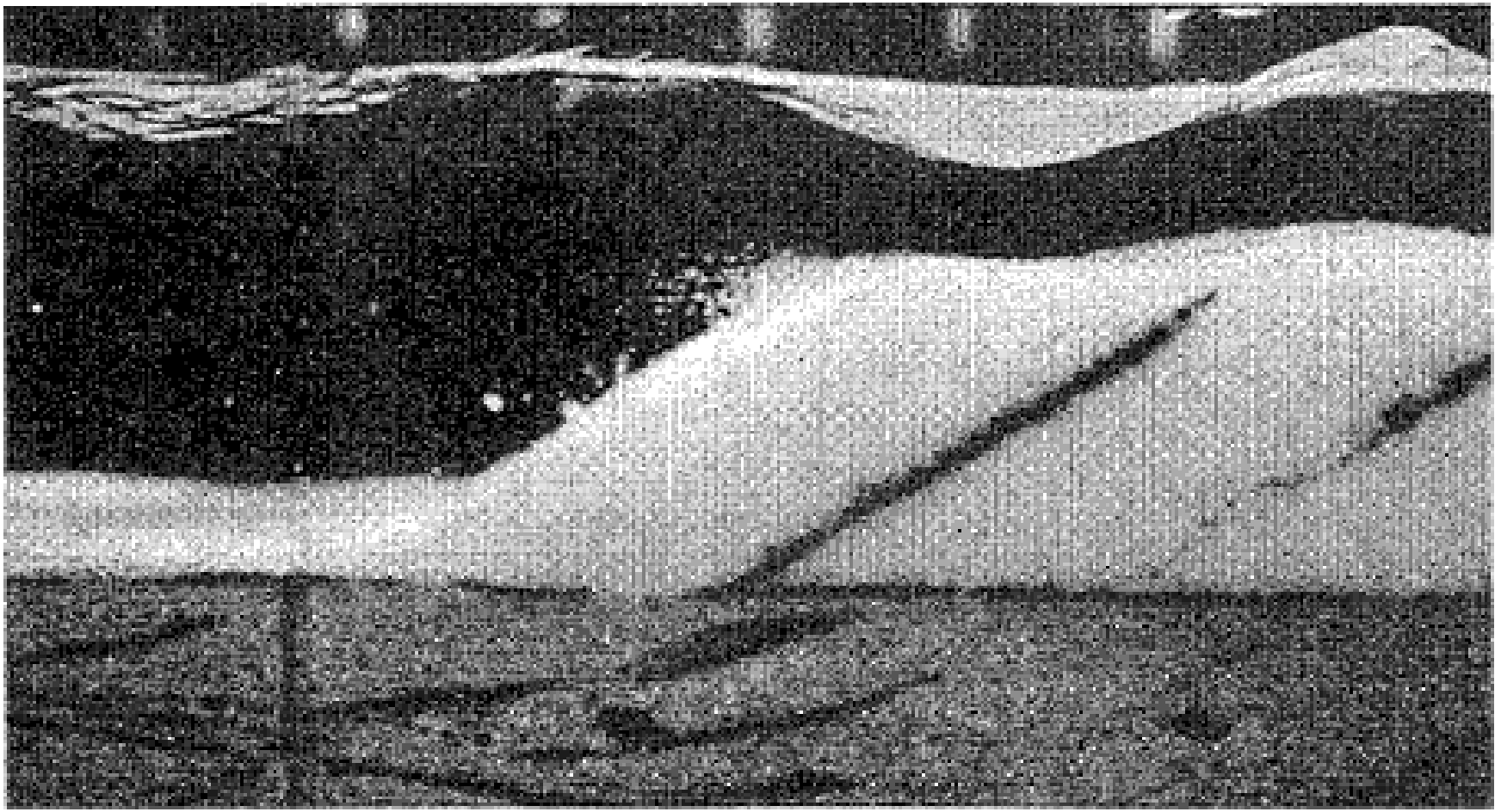
Stokes Law

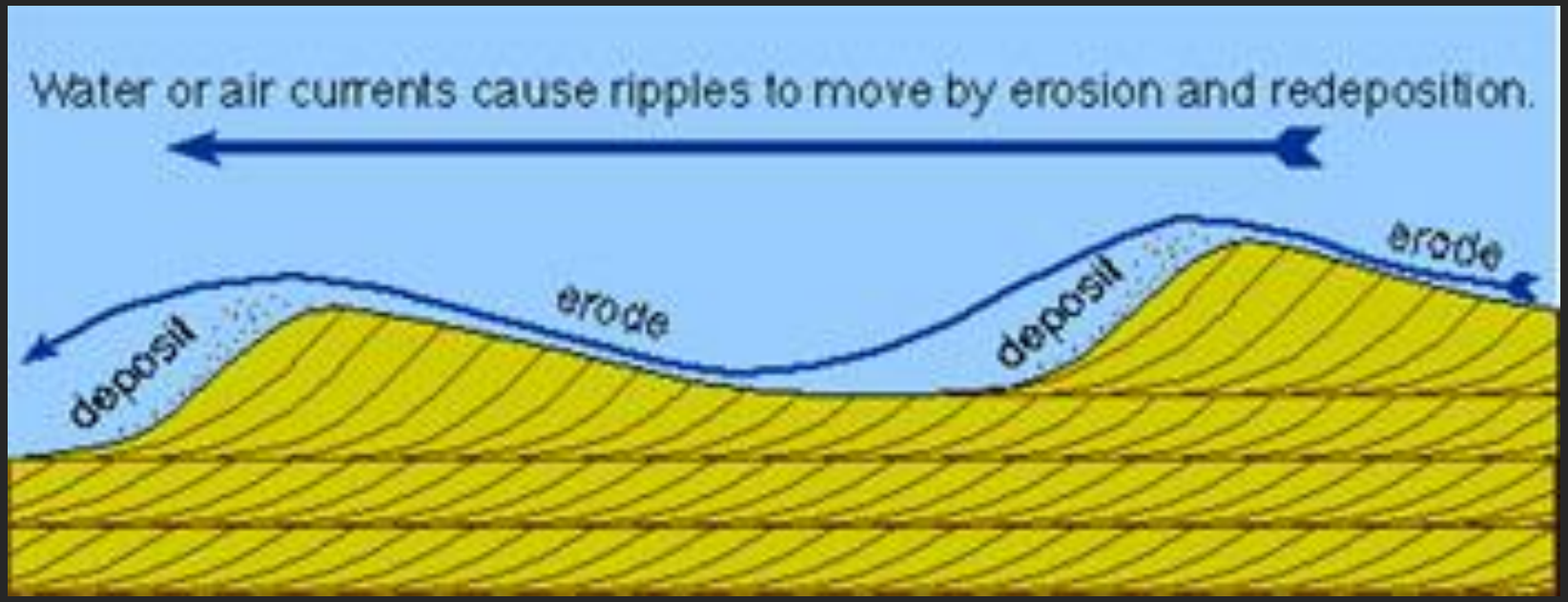
Estimate the settling rate of particles in a fluid

Formation of cross bedding

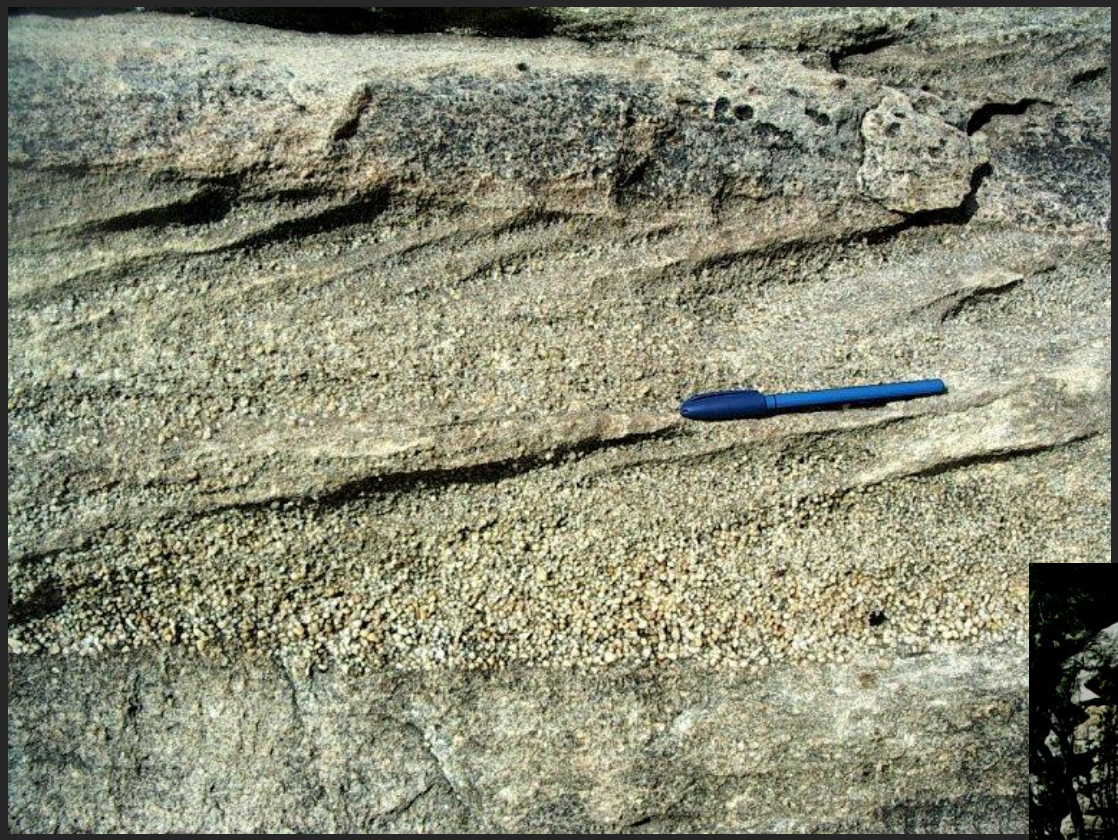


Flume experiments

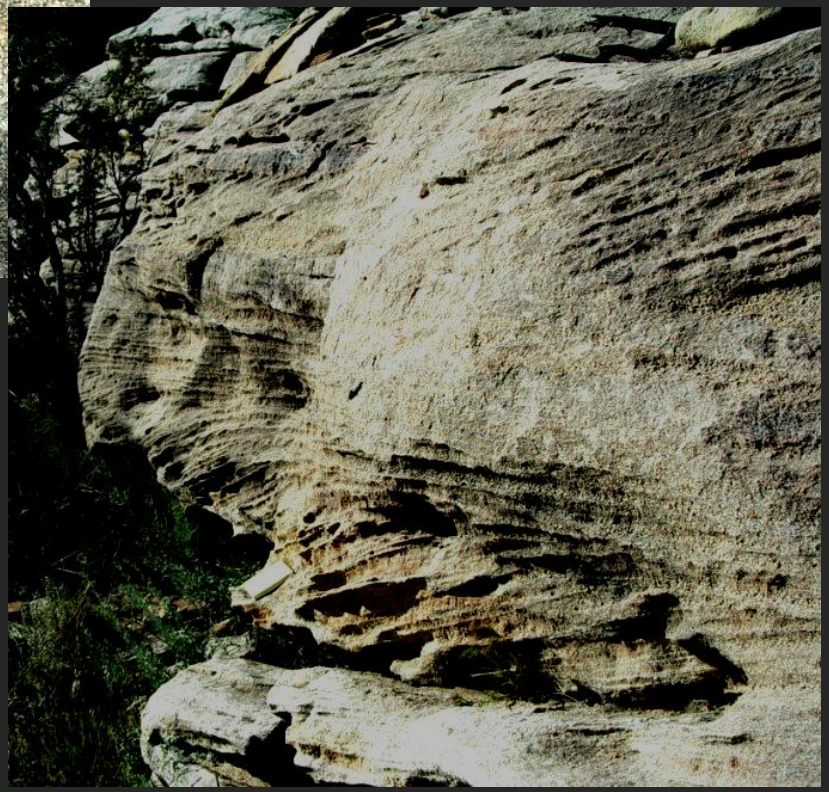




http://www.pitt.edu/~cejones/GeoImages/5SedimentaryRocks/SedStructures/CrossBedding1.html

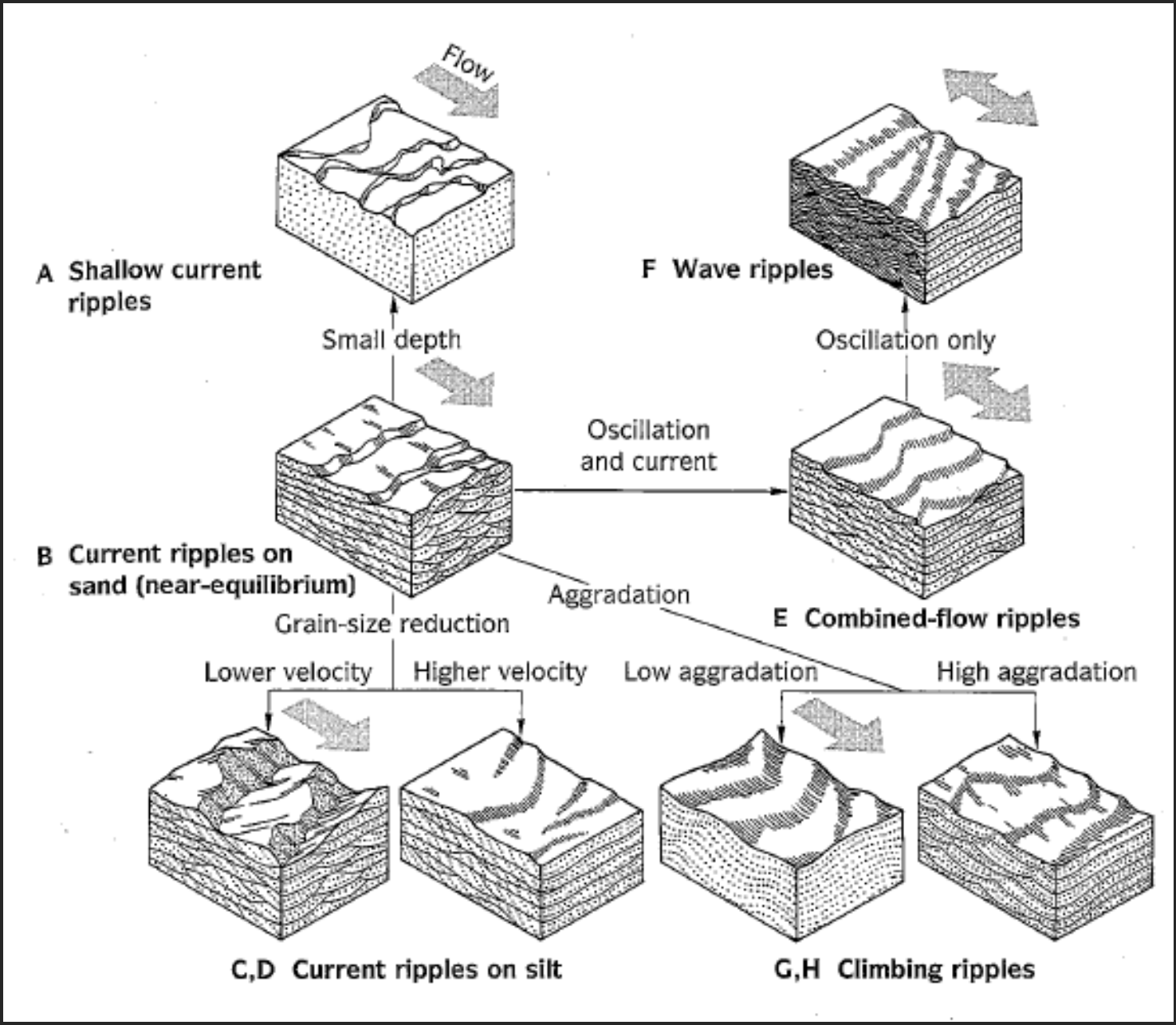


Cambrian Tapeats sandstone, Chino Valley Arizona



Fluvial cross beds

Cretaceous sandstone, Dinosaur Park, Alberta



Prothero and Schwab

Climbing ripples

Planar versus Trough cross-bedding

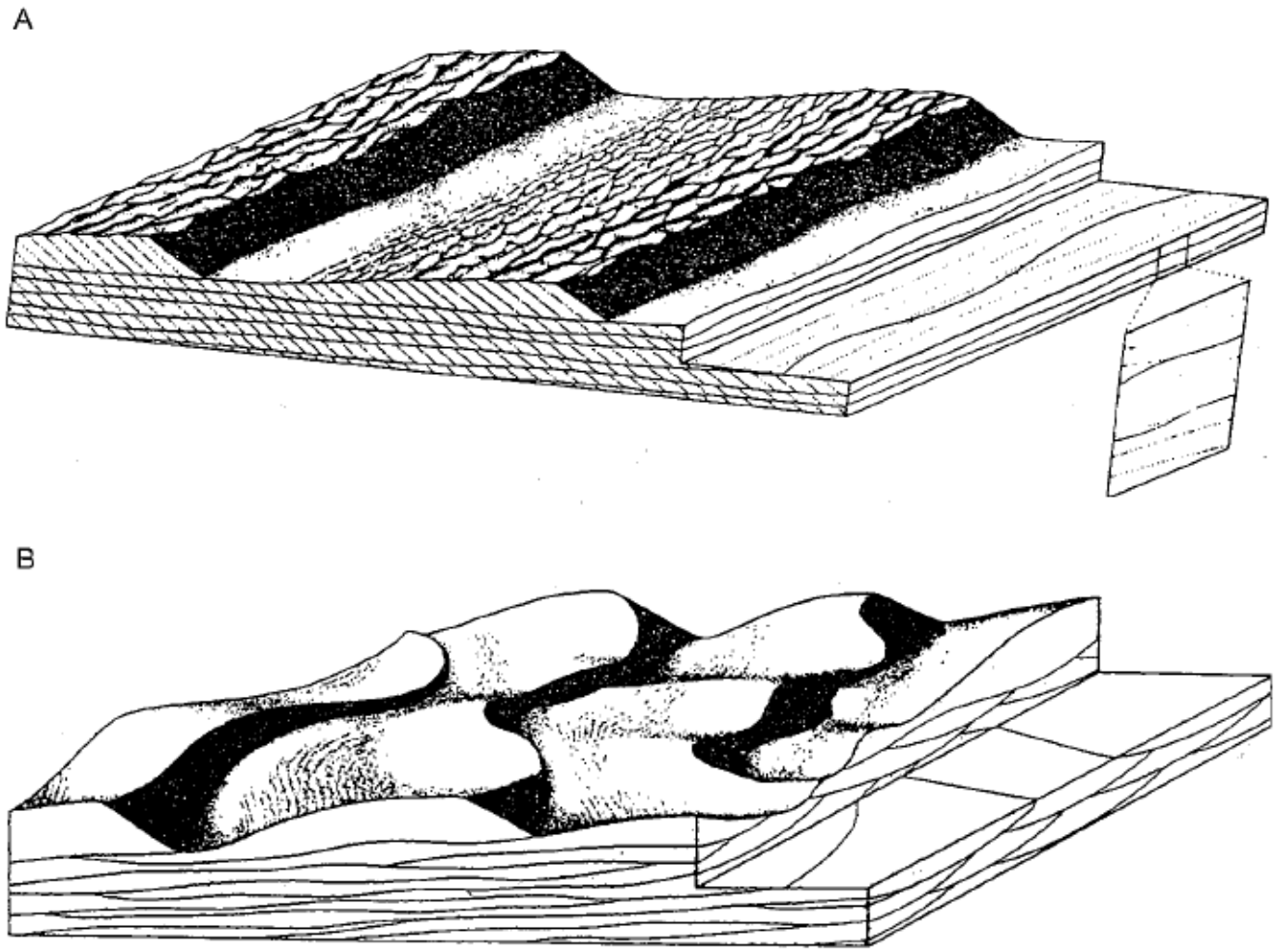
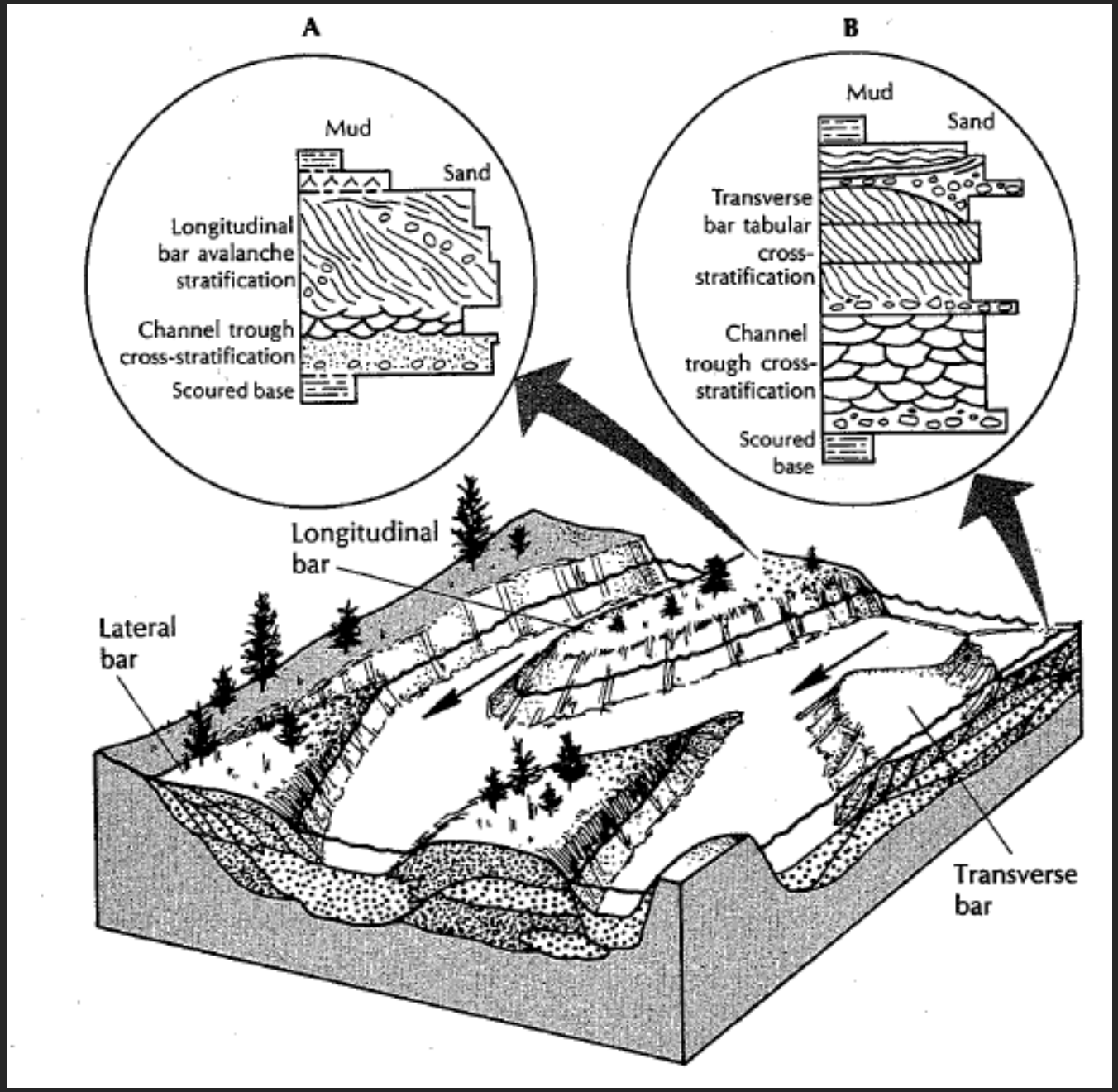


Figure 4.20
Diagram illustrating (A) large-scale tabular cross-bedding formed by migrating straight-crested dunes (with rippled surfaces) and (B) large-scale trough cross-bedding formed by migrating, trough-shaped dunes. Flow is from left to right in both A and B. [From Harms, J. C., J. B. Southard, and R. G. Walker, 1982, Structures and sequences in clastic rocks: Soc. Econ. Paleontologists and Mineralogists Short Course No. 9, Fig. 3-11, p. 3–23 and Fig. 3-10, p. 3–19, reprinted by permission of SEPM, Tulsa, Okla.]

Boggs

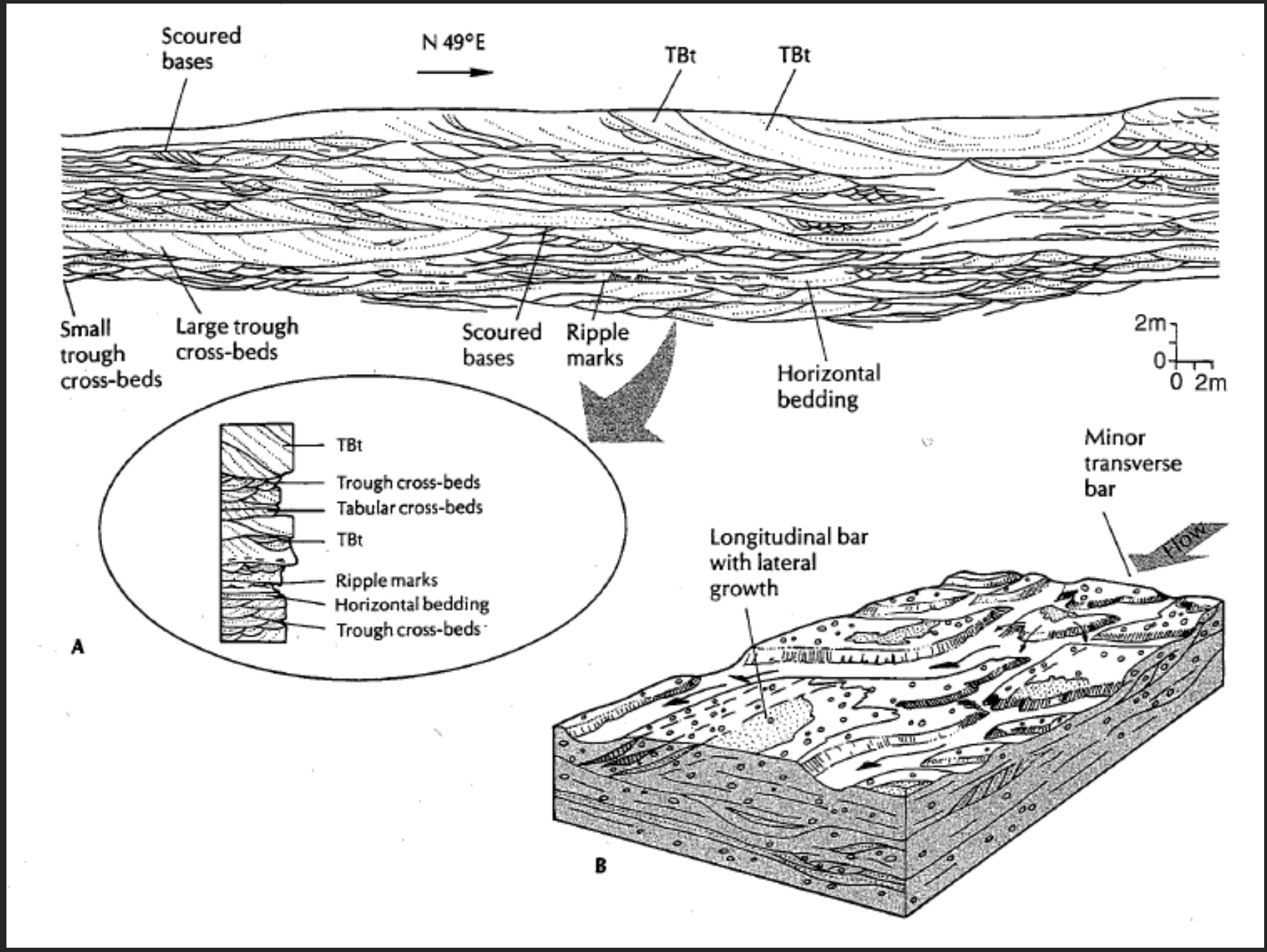
Steep cross-beds with an angular lower boundary: sediment too coarse to be carried in suspension

Tangential lower boundary: smaller sediments that can be carried in suspension

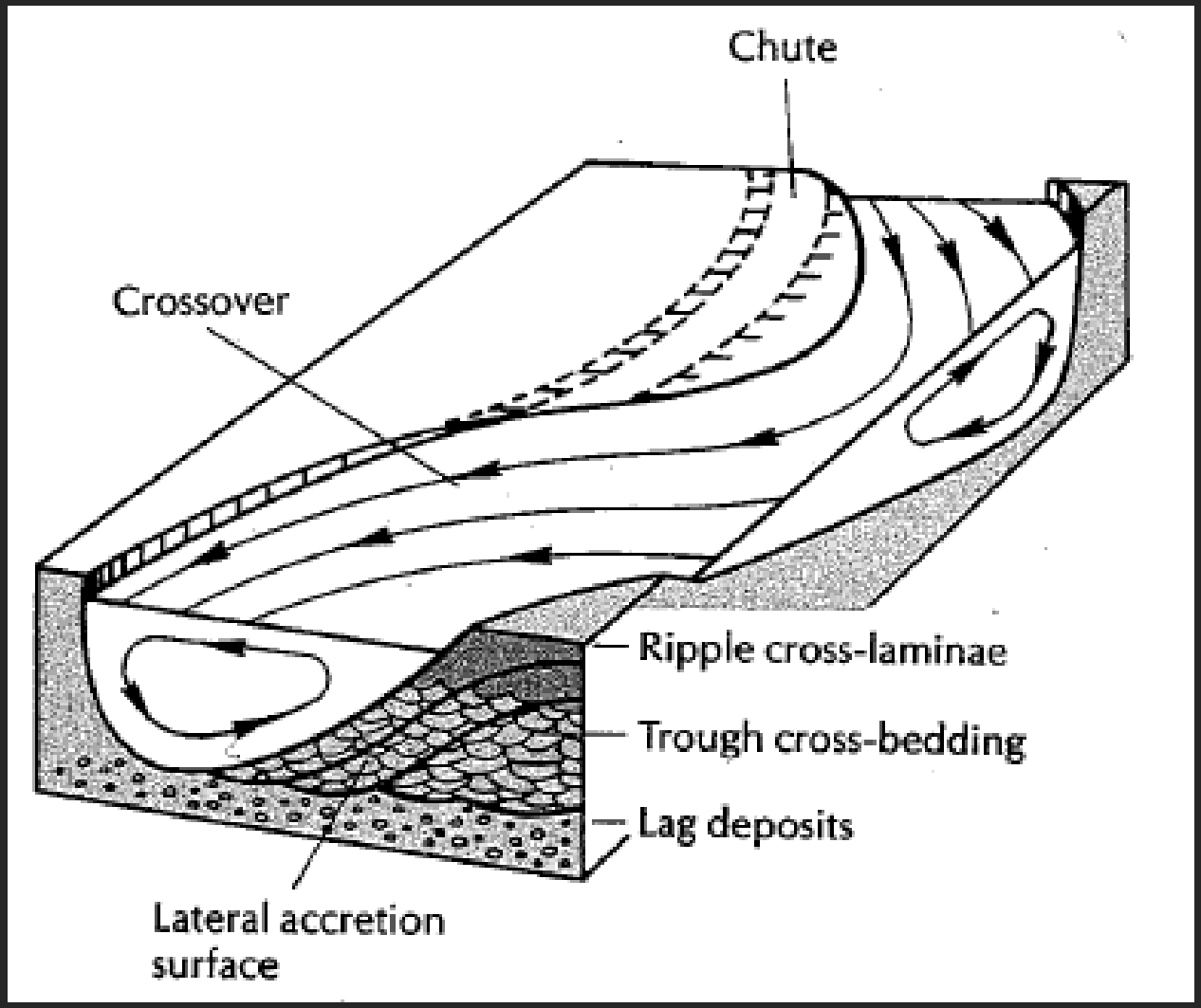


Braided system

Prothero and Schwab



Prothero and Schwab



Meandering system

Prothero and Schwab

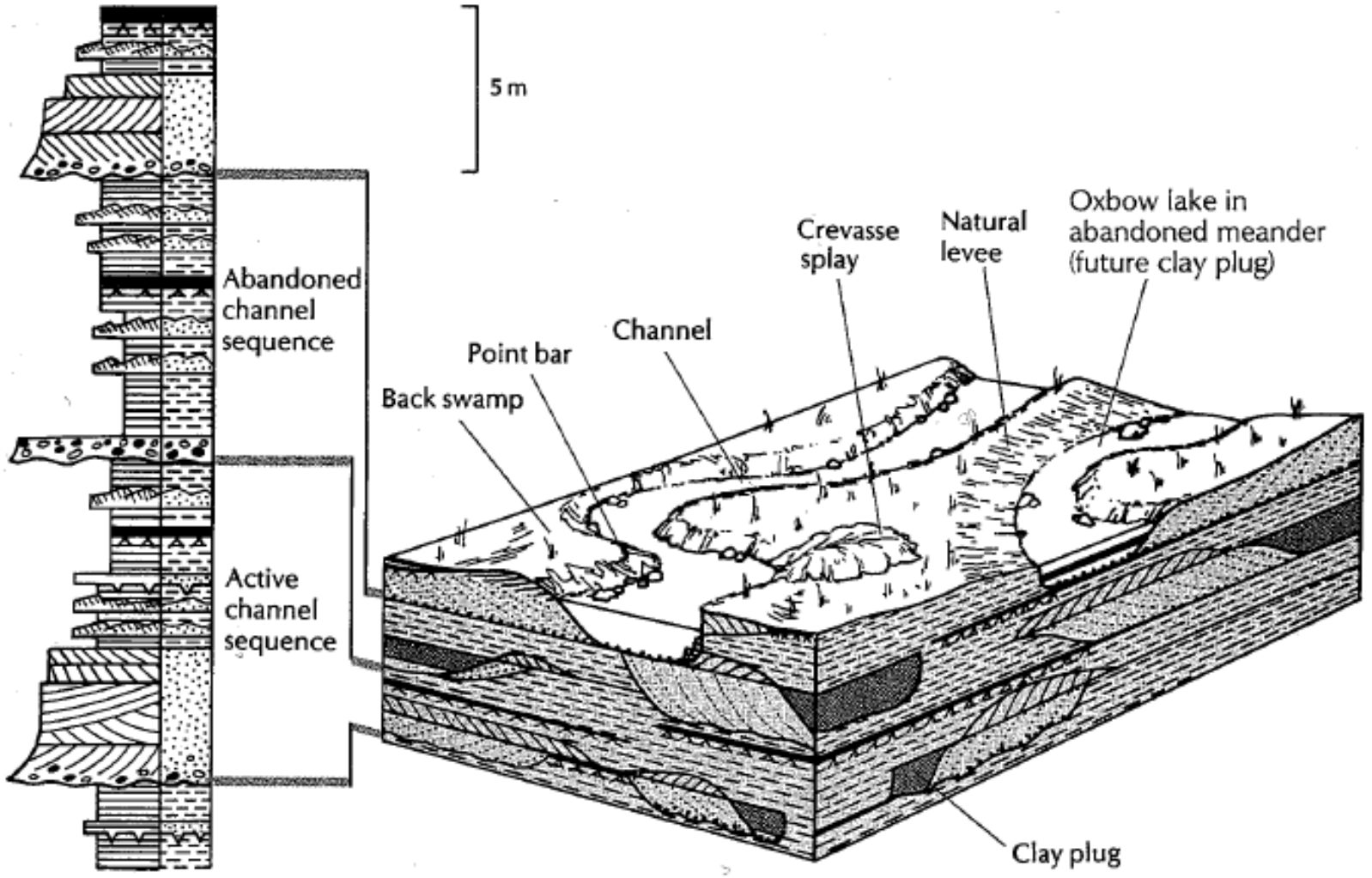
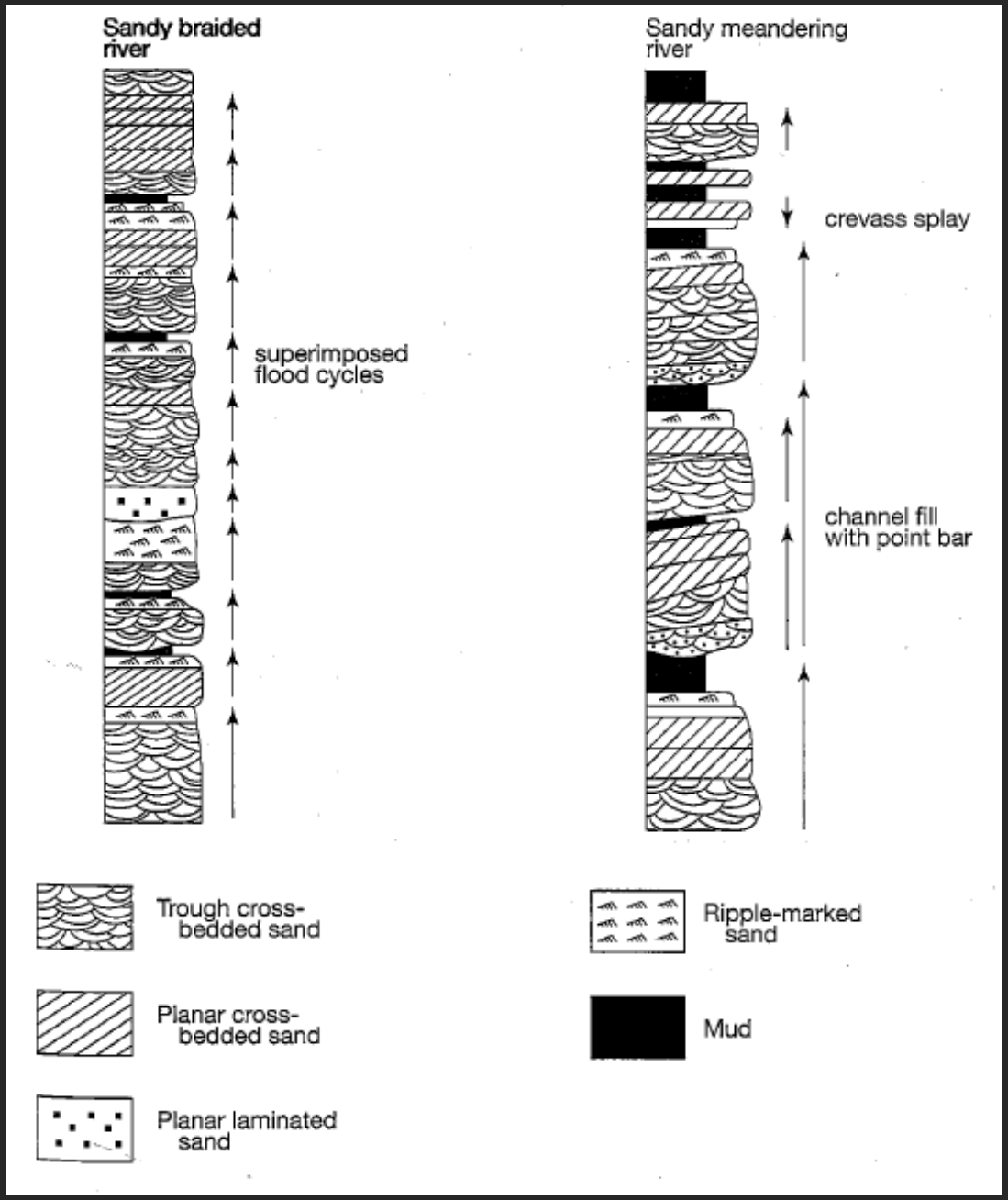


Figure 8.9 Typical three-dimensional geometry and characteristic vertical sequence of a meandering floodplain deposit, showing point bars, crevasse splays, and clay plugs filling oxbow lakes, all interrupting thick sequences of vertically accreted floodplain mudstones. (After Hallam, 1981, and Selley, 1978.)

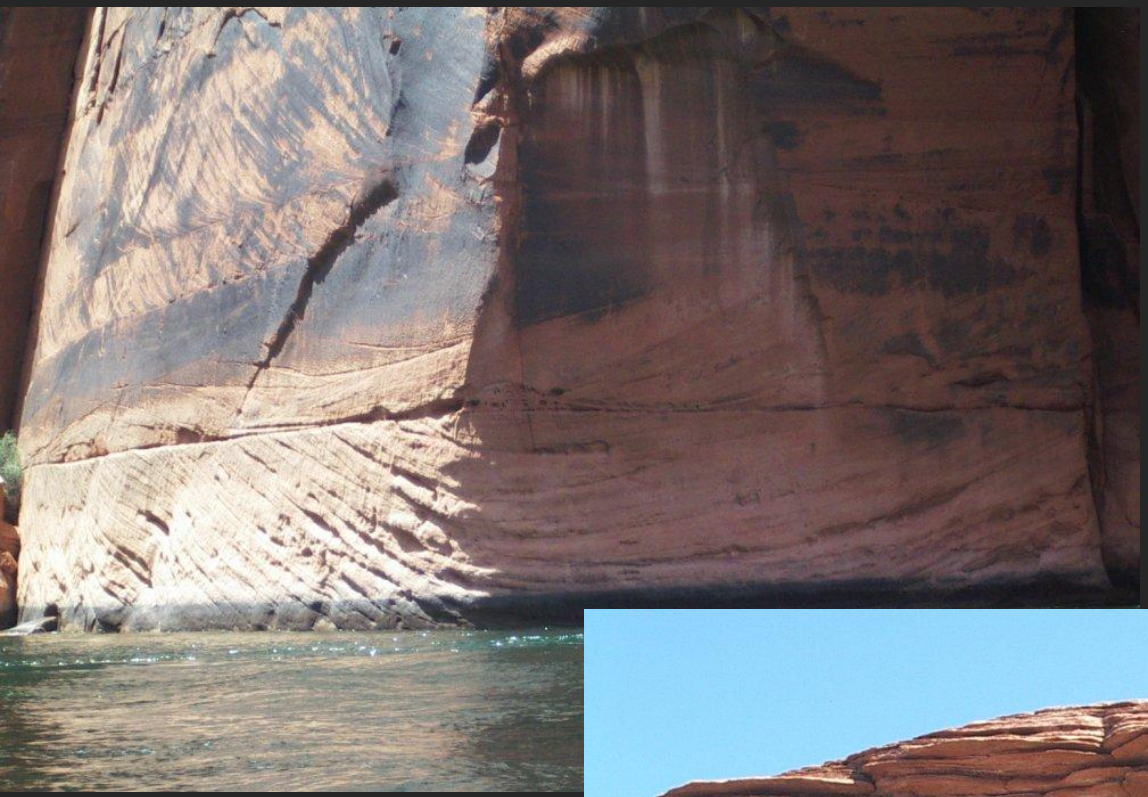
Prothero and Schwab



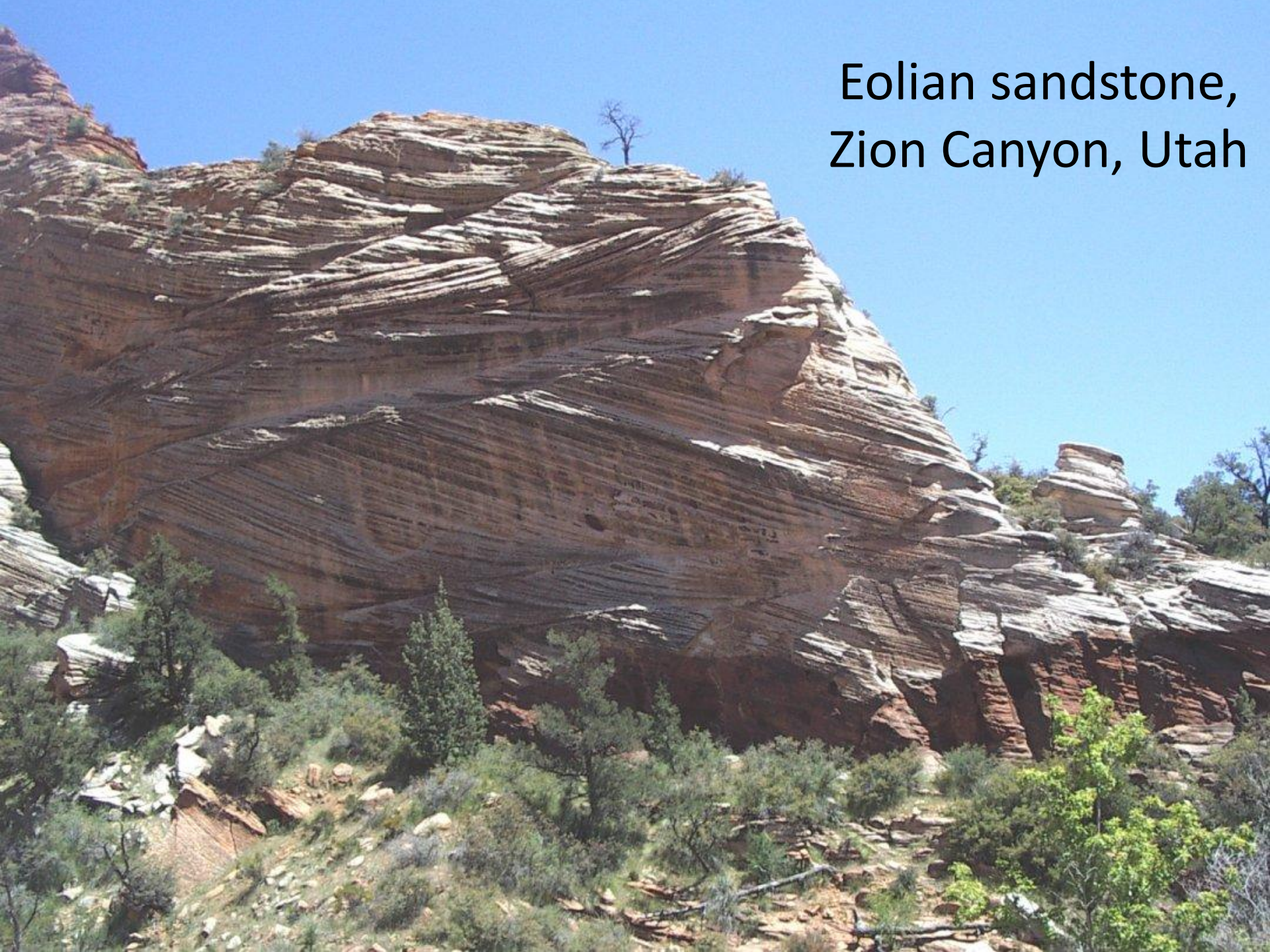
Typical stratigraphic sequences in braided versus meandering systems

Boggs

Permian Coconino eolian sandstone, Grand Canyon, Arizona



Jurassic Navajo eolian sandstone, Glenn Canyon, Arizona


Eolian sandstone,
Zion Canyon, Utah