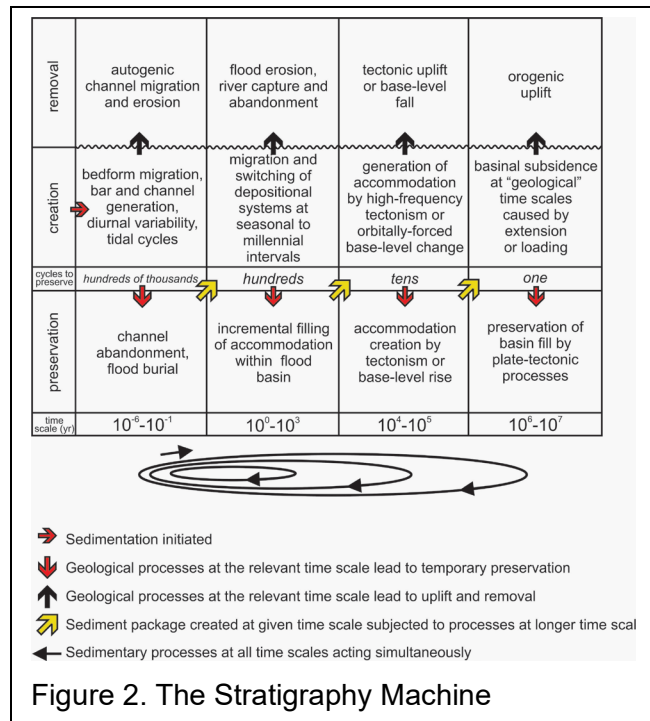




as little as 10% of the elapsed time represented by the section is recorded by actual sediment (e.g., see Miall, 2014; Bhattacharya et al. 2019). These processes may be formalized in the concept of a “Stratigraphy Machine”, as illustrated in Figure 2.

This figure represents an attempt to express in tabular form the hierarchy of processes that generate and remove sediments over the full range of geological time scales. For convenience, the time scale is subdivided into four broad and overlapping time ranges. To read the diagram, enter at the red arrow on the left. Sediments are generated by depositional processes, with preservation (downward directed red arrow) or removal (upward directed black arrow) creating the initial succession. With the passage of time, longer-term processes affect the succession (diagonal yellow arrow), with preservation and/or removal acting over the progressively longer time scales. High-frequency processes are episodic or gradual over extended time periods and affected by longer term processes. Thus, as implied by the nested loops at the base of the diagram, a longer allocyclic process or episode will affect the autogenic processes operating at the shorter time scales. Sufficient time ( $\geq 10^7$  years) must elapse for all geological processes to complete at least one full cycle. Numerous sedimentary breaks of various durations are generated at all stages, as indicated by the wavy unconformity symbol crossed by the upward-directed black arrows. The end product is the preserved rock record, and is represented by the lowermost box at the right. This shows the preservation of a basin fill by the long-term accommodation driven by plate-tectonic processes, for example, the slow thermal subsidence at an extensional continental margin. A guide to the use of this diagram and its application to stratigraphic interpretation is in press (Holbrook and Miall, in press).



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