

## **Perspectives on the Geological Time Scale for the 21st Century**

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In this duet and following discussion, different viewpoints are offered on three aspects of the evolving geological time scale:

1. Chrono-Stratigraphic Units. 'Golden spikes' (GSSP's) provide precise geochronologic definitions for stages and periods. Do GSSP's make 'time-rock units' necessary? Can some stages be replaced by absolute-time units? Maybe a new and simplified stratigraphic code will emerge in the third Millenium.

2. New Geological Stages. Some stratigraphic subcommisions, such as the Ordovician, have taken the bold initiative to strip periods of their historical regional-based stages and develop new broad stages fixed to global correlations and associated boundary stratotypes. In contrast, a trend in the Cenozoic is to advocate very short new stages between a golden spike and the classical boundaries of an historical regional stage.

3. The Time Scale Game. It is rare that a stage boundary contains horizons suitable for radiometric age dating, therefore estimates of stage boundaries are estimated by diverse interpolation methods. This include use of astronomical cycles, correlation to marine magnetic anomaly profiles, maximum-likelihood statistics, spline fits, and biostratigraphic zonal counts. A further challenge is to incorporate uncertainties from the diverse suite of constraints. Our philosophy that a better understanding of evolving methodologies in establishing the time scale will enhance consensus and benefit applications in earth sciences.