Cutting time in slices

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Abstract

One of the main achievements of geology in the eighteenth-century was the conquer of time. The recognition that rocks could be older than previously supposed and that there was an order regulating their deposition radically changed the perspective in stratigraphy. Geological processes finally revealed to enclose a huge vastness of time, that had to be framed in a scale. Inevitably, attention moved to the criterion by which successions of strata could be identified and correlated throughout the world. The most immediate one was to stress on major discontinuities directly readable in the field and lithological features were soon applied to discriminate relevant time slices. However, while Earth was discovered to be older and older, it became evident that rocks were pullulated by a myriad of events, which were the most reliable for arranging in time the sequences of strata. Even with a biological approach, discussion arose on how to face time division and whether discontinuity (catastrophism) or continuity (uniformitarianism) should be the rule in cutting time in slices. The debate was extended in selecting the best combination of fossils (appearance, disappearance, range, abundance, etc.) and geographical distribution that could truly reflect a fraction of time. In any case, not even the best biozonation frame was able to perfectly match a chronological subdivision, and only the discovery of radioactivity and the application of radiometric dating enabled to put precise numbers on the geological scale and to create a rigid frame with horizontal time subdivisions that had now to be filled with names. The Chronostratigraphic Scale was further "nailed" with a series of Golden Spikes, the only points in which, according to Holland (1999), time-rock and rock coincide in space.
Chemostratigraphy, magnetostratigraphy and cyclostratigraphy have been later able to provide new tools for more accurate and easily comparable correlations. Together with an often-obsessive search of splitting time in thinner and thinner intervals, stratigraphers are now integrating diverse markers in order to increase the exactness, precision and reliability of the Chronostratigraphic Scale.

REFERENCES

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