

Quality of the fossil record through time

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Does the fossil record present a true picture of the history of life^{1, 2, 3}, or should it be viewed with caution^{4, 5, 6}? Raup⁵ argued that plots of the diversification of life² were an illustration of bias: the older the rocks, the less we know. The debate was partially resolved by the observation⁷ that different data sets gave similar patterns of rising diversity through time. Here we show that new assessment methods, in which the order of fossils in the rocks (stratigraphy) is compared with the order inherent in evolutionary trees (phylogeny), provide a more convincing analytical tool: stratigraphy and phylogeny offer independent data on history. Assessments of congruence between stratigraphy and phylogeny for a sample of 1,000 published phylogenies show no evidence of diminution of quality backwards in time. Ancient rocks clearly preserve less information, on average, than more recent rocks. However, if scaled to the stratigraphic level of the stage and the taxonomic level of the family, the past 540 million years of the fossil record provide uniformly good documentation of the life of the past.

<http://www.nature.com/nature/journal/v403/n6769/abs/403534a0.html>