

Stratigraphy in the Anthropocene - nailing down chronostratigraphy

Wagreich M.*, Draganits E. & Sames B.

University of Vienna, Austria.

Corresponding author email: michael.wagreich@univie.ac.at

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The Anthropocene is now under investigation of the Anthropocene Working Group (AWG) of the Quaternary Subcommission. Whereas the AWG indicates that the Anthropocene is stratigraphically real, and formalization at epoch rank is recommended (Zalasiewicz et al., 2017), other publications disregard any potential for a formally defined chronostratigraphic unit of the Geological Timescale (GTS) for various reasons, including the shortness of its duration or a better attribution to other disciplines like history or politics. In defining an Anthropocene as a chronostratigraphic unit, the AWG is committed to chronostratigraphy and various suggestions for starting points have been published so far. However, no GSSP section was defined yet, and the golden spike primary marker remains undefined, but many suggestions prefer artificial bomb nuclides from 1950 to 1965 (Zalasiewicz et al., 2017).

We notice several interesting points regarding stratigraphy:

(1) The second Copernican revolution brought a new view of the Earth as a single complex system, revolving Earth Sciences into Earth System Sciences, but also reversing the natural sciences progression into a revived anthropocentric view of the world with humans as a prominent natural force.

(2) Uniformitarianism, a first principle of geology, no longer holds true for Anthropocene strata, where we find artificial materials, minerals and chemical compounds never before existing on Earth and geological processes modified by humans, from planetary material fluxes, induced earthquakes to least nuclear fission.

(3) The current method of GSSP chronostratigraphy was perfectly suitable for diffuse and hard to date deep-time boundaries, but becomes more and more questioned by the development of precise and exact numerical dating methods in geochronology and astrochronology. This dilemma is especially exemplified by current stratigraphy effort applied on the Anthropocene aiming for a chronostratigraphic boundary and thus GSSP golden spike point which might be defined in a time frame covered by the unifying and precise time scale of the historical calendar, so historical and geological time scales would meet. This time scale allows for the precision down to splits of seconds and results in the golden spike (or pin) being inaccurate and artificial. A reiteration of the GTS from top (youngest)-down may be the future way. The challenges faced in defining the stratigraphy of the Anthropocene may provide the opportunity for the discussion to change chronostratigraphy into a numerical stratigraphy.

Zalasiewicz J., Waters C.N., Summerhayes C.P., Wolfe A.P., Barnosky A.D., Cearreta A., Crutzen P., Erle E., Fairchild I.J., Galuszka A., Haff P., Hajdas I., Head M.J., Ivar do Sul J.A., Jeandel C., Leinfelder R., McNeil J.R., Neal C., Odada E., Oreskes N., Steffen W., Syvitski J., Vidas D., Wagreich M. & Williams M. (2017) - The Working Group on the Anthropocene: Summary of evidence and interim recommendations. *Anthropocene*, 19, 55-60.

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