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Ozymandias in the Anthropocene: A conceptual framework for the city as an emerging landform

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The Anthropocene is a topic receiving much attention in the geomorphological community, as well as in wider scientific and public spheres. The application of the Anthropocene as a theoretical framework within geomorphology has so far had a clear anthropogenic focus; considering how human activities are affecting geomorphological processes and shaping the natural environment. An area which has so far not received attention is how fundamental geomorphological processes interact to alter, shape and potentially destroy anthropogenic infrastructure and urban landscapes. In some cases these processes can lead to emergent urban geohazards (e.g. “sinkholes”), and damage to urban infrastructure; additionally, they may also lead to the development of unique Anthropocene geomorphological forms. There is therefore a need to develop a conceptual framework for how earth science principles can be integrated with a broad spectrum of research areas, including archaeology, social science and geology, to underpin future field studies.

The number of people living in cities already outnumbers those who do not and the urban population and urban extent is expected to continue to grow. Within this landscape there is a theoretical justification for identifying the formation of pseudokarst within the urban fabric, including the formation of urban stalactites and urban sinkholes. Additionally, both the chronic and acute degradation of urban buildings can form rubble and dust which if left in situ will be shaped by fluvial and aeolian processes.

For many of these urban geomorphological processes the neglect or abandonment of parts of the urban network will facilitate or accelerate their influence. If there are economic, climatic or social reasons for abandonment or neglect these processes are likely to reshape parts of the urban fabric into unique landforms at a range of scales. We consider examples of; urban stalactite formation on bridges and within subterranean tunnels, the formation of urban regolith deposits as a result of building collapse, and the formation of sinkholes in made-earth underlying asphalt as potential case studies of unique Anthropocene urban geomorphologies. We make links with previous abandoned structures and civilisations and suggest that by understanding how geomorphological processes act upon the built environment in the present day important insights can be gained for archaeological studies. We suggest abandoned or neglected areas which may be ripe for case study work such as Chernobyl, the tunnels beneath London, and the US “rust belt”.

To fully investigate Anthropocene urban geomorphologies will require a flexible and broad conceptual framework encompassing true interdisciplinary work including: geomorphologists, geologists, karst scientists, civil engineers, archaeologists and social scientists. We suggest that without explicitly considering these phenomena in the urban environment there is a risk of making the mistakes of Shelley’s “Ozymandias”, in which the eponymous king failed to account for the impact of geomorphology on the fabric of his (now long fallen) empire.