



## **The primacy of process over structure in landform evolution**

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It is a contention of this paper that self-similar surface processes tend to generate self-similar landforms regardless of inherited structure. We present evidence from physical modelling studies of mountain evolution to justify this deliberately provocative contention: our intent is to promote debate rather than reach conclusions in this presentation. Our experimental apparatus is an erosion box in which two opposing panels can slide independently, so simulating base-level fall or rise across emerging topography. Rainfall is generated by an ultra-fine misting apparatus. Digital topography is generated from telemetric laser measurements and sediment flux is directly measured on both sides of the model orogen. Each of our experiments has produced statistically similar strikingly unique topographies that develop in the absence of complicated local contingencies. We cannot show how heterogeneous structure might influence experimental topography but argue that realistic, strikingly unique topographies do not require complicated local contingencies. Thus we posit the following question: Can erosional surface-processes acting on a homogenous substrate generate the spectra of topographic characteristics that we observe in erosional landscapes today? Our data suggest (but do not require) that the answer to this question is yes. We also argue that the similarity between river networks and mountain ranges in a wide range of unique local settings throughout the world indicate that geological structure is of second order importance to topographic form.