Physicists study how pebbles form their shapes over the course of their eroding adventures

D. J. Durian and his colleagues evaluated possible models by experimentally simulating erosion with artificial pebbles made of five millimeter thick tiles of clay that were molded in various geometrical shapes including squares, triangles, and other polygons.

The researchers tracked changes in the tile shapes as they tumbled on a tilted, rotating pan. The tiles' sharp corners rapidly wore away, but the physicists were surprised to find that the tiles ultimately approached geometrical shapes including squares, triangles, and other polygons.

Instead they tended to form more intricate shapes that were almost, but not quite, circles. In addition, the final shapes are the same regardless of the artificial pebble's starting shape.

More involved models that take into account the fracture of protruding points predicted final tile shapes more accurately. Although the research is in its early stages, theories of pebble erosion could soon provide clues to geological history encoded in various pebble shapes. The study will appear in Physical Review Letters.
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