

Abstract Submitted
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Correlation of hatchling mass and egg volume in extant birds from *Archilochus colubris* to *Struthio camelus* SCOTT LEE, MAX COOLEY, University of Toledo, JOSHUA THOMAS, Clarkson University, RICHARD IRVING, University of Toledo — Observations suggest that the birds hatch when they are near the maximum size that can be contained in their egg. In order to test this hypothesis, we have measured the volume of eggs of nineteen bird species from *Archilochus colubris* (the ruby-throated hummingbird) to *Struthio camelus* (the ostrich). The hatchling mass of these birds vary by more than three orders of magnitude. The volume of the eggs were measured by using scaled pictures of the eggs. The OpenCV library, and a custom python code was used to detect the edges of the eggs. We assumed the images were taken at right angles to the eggs, and that the eggs have cylindrical symmetry around the long axis. The points along the edges of the egg were fit with a polynomial to avoid resolution-induced calculation issues. The surface area and volume were calculated as if the points were a solid of revolution. Our method reproduces the volumes of ellipsoids with known dimensions with errors of less than 1%. The hatchling mass is found to depend on the egg volume via a power law with an exponent of 1.01 (standard deviation = 0.04), in support of the hypothesis. This relationship predicts a hatchling mass of 8.0 kg for the extinct *Aepyornis maximus* (the giant elephant bird), the largest known bird for which intact eggs exist.

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