1114-49-324 **Michael J Campbell*** (michaeljcampbell@outlook.com), michaeljcampbell@outlook.com, and **Joseph Hanna**, joeyhanna@berkeley.edu. *The Optimal Can: An Uncanny Approach.*

We examine a novel variation on optimizing cost for a cylindrical can. The standard problem minimizes material costs, which amounts to minimizing the surface area given a fixed volume, yielding a height equal to the diameter of the top circle (square front profile). We add distribution/storage cost to the material cost to get the total production cost. These distribution and storage cost terms are sourced from an actual carrier company that distributes cans, thus the simulation is faithful to real-life shipping and storage costs.

We show numerically that for low distribution/storage costs, the can has the classic square profile, and for distribution/storage costs above a critical value, the symmetry of the square is broken and the can takes on a rectangular profile resulting from the rectangular geometry of the distribution truck or storage cabinet. Interestingly, the dimensions remain constant above and below the critical ship/store cost, exactly as with a Landau phase transition in statistical mechanics. This Landau-type transition has the same basic phenomenology as a Landau approximation to a magnetic system which is non-magnetic above a critical temperature, but magnetizes below a critical temperature, much like a Curie temperature for a discontinuous phase transition. (Received September 01, 2015)