1042-52-173 **Ser-Wei Fu**, Department of Mathematics, University of South Carolina, Columbia, SC 29208, and **Ralph Howard*** (howard@math.sc.edu), Department of Mathematics, University of South Carolina, Columbia, SC 29208. *Determining centrally symmetric convex polyhedra by the perimeters of central sections.* Preliminary report.

In his book, *Geometric Tomography*, Richard Gardner posed the problem: Let K and L be convex bodies in $\mathbf{R}^3$ centrally symmetric about the origin. If, for all planes, P, through the origin

$$\text{Length}(\partial K \cap P) = \text{Length}(\partial L \cap P)$$

does it follow that $K = L$? We make some progress on this problem in the case K and L are both polyhedra one of which is required to satisfy some non-degeneracy conditions. As a special case, the regular octahedron is determined by the perimeters on its central sections within the class of centrally symmetric polyhedra. (Received August 18, 2008)