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David G. Costanzo* (dcostan2@kent.edu). *Central Camina Pairs.*

Let G be a finite group, and let N be a nontrivial proper normal subgroup of G . The pair (G, N) is called a **Camina pair** if $|\mathbf{C}_G(x)| = |\mathbf{C}_{G/N}(Nx)|$ for every $x \in G \setminus N$. We will consider the case when $N = \mathbf{Z}(G)$. In this situation, G is a p -group of nilpotence class at least 2. When G has class 2, the bound $|G : \mathbf{Z}(G)| \geq |\mathbf{Z}(G)|^2$ holds. M.L. Lewis conjectured that this bound holds whenever $(G, \mathbf{Z}(G))$ forms a Camina pair and laid the groundwork for proving this statement. We resolve this conjecture when G has nilpotence class at least 4. When G has class 3, we can prove that $|G : \mathbf{Z}(G)| > |\mathbf{Z}(G)|^{3/2}$. In our talk, we discuss some ideas behind the proof. (Received August 15, 2019)