1056-Z1-52 **Joan E Hart*** (hartj@uwosh.edu), University of Wisconsin Oshkosh, Mathematics Department, 800 Algoma Boulevard, Oshkosh, WI 54901-8631, and **Kenneth Kunen**. *Arcs in the plane.*

Every Cantor set E in the plane is contained in an arc. But the arc need not be smooth or have finite length. Must every Cantor set E at least *meet* a "nice" arc in an uncountable set? Yes, if "nice" means the arc is the image of a path g with $g'$ nowhere 0 and continuous (that is, the arc is $C^1$). No, if "nice" also means $g''$ is continuous (so, the arc is $C^2$). This talk looks at recent results that use derivatives, Taylor's Theorem, and other ideas from calculus and elementary analysis to show there is a Cantor set E that meets each $C^2$ arc in a finite set. For arbitrary uncountable E, the results are independent of the usual axioms of set theory. For these more general E, some results are old, but we note recent partial results for $C^1$ arcs, as well as "nice" questions that remain open. (Received July 16, 2009)