1133-05-137 **Dan Biebighauser** and **Mark Ellingham*** (mark.ellingham@vanderbilt.edu). *Circuit graphs and relative connectivity.*

Induction arguments for k-connected graphs can be difficult because subgraphs of a k-connected graph are not necessarily k-connected. In 1966 David Barnette found a way to get around this for 3-connected planar graphs. He showed that every 3-connected planar graph has a spanning tree of maximum degree at most 3 by working with a more general class of graphs known as *circuit graphs*, which behave well in induction proofs. Similar ideas have been used in proofs of other results on hamiltonicity, spanning trees, and related concepts. We show how these ideas can be extended in a general way. In particular, if G is a graph and $S \subseteq V(G)$, we can define G to be *k-connected relative to S*, or (k, S)*-connected*, if certain conditions hold. We establish some basic properties of this concept and illustrate how they can be used. (Received July 20, 2017)