1067-C1-2352 **Tevian Dray*** (tevian@math.oregonstate.edu), Department of Mathematics, Oregon State University, Corvallis, OR 97331. *Using Differentials to Teach Calculus Coherently.*

For the last 40 years, differentials have been taboo in calculus, having been turned into something else entirely: a tool for linear approximations. While mathematicians can be justly proud of the rigor introduced in the 1800s, we seem to have forgotten that calculus was used successfully before then, let alone that those early methods were rigorously justified in the 1960s. Many scientists and engineers apply calculus by manipulating differentials, and for good reason: it works.

We report here on our efforts to make differentials the central theme in calculus, initially through our very successful 15-year effort to bridge the gap between lower-division mathematics and upper-division physics, then through our much less successful attempt to apply what we had learned to first-term calculus. Although some of our evidence is anecdotal, we also have qualitative evaluations based on student work in vector calculus, as well as data obtained with the Calculus Concept Inventory (CCI). (Received September 22, 2010)