Human locomotion costs substantial energy, making it important to minimize that cost. The energy minimization is subject to constraints, mainly from the inertial dynamics of the legs, which thus govern many of the preferred and stereotypical gait patterns. But what is true for the legs appears not to be for the arms, whose motions are more dependent on task demands such as precision and accuracy, which are mainly kinematic. The dynamics of the arm only matter to the degree that the nervous system cancels them out. This raises the question whether the control strategies for legs and arms are entirely distinct and incompatible, or perhaps they merely lie on some under-appreciated continuum. To address this, we will examine the mechanistic cost trade-offs, for example muscle properties, that govern typical walking behaviors. We will then examine how these same costs might or might not apply to arm motions, and whether the arms are indeed kinematic and the legs dynamic. I will claim that the arms are probably dynamic after all.