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The Autosegmental-Metrical (AM) view of intonation has developed over the last few decades to describe the intonational systems of several languages, especially as instantiated in the Tones and Boundary Indices (ToBi) framework. In this approach, a sharp distinction is drawn between abstract phonologically invariant level tones that form pitch accents, phrase accents, and boundary tones, and highly variant phonetic F0 contours, with many rules connecting the phonological and phonetic levels. In this work, we present a different basic approach that relies on Dynamical Systems analysis that provides a simpler integrated view of the phonological and phonetic aspects of intonation, using an extensive dataset of American English F0 contours. It will also be shown that many aspects of intonation that are unaccounted for or stipulated in AM, follow naturally from the dynamical account.