The automatic synthesis of compositions cannot proceed unless based on formally complete, i.e., computable, models, otherwise a composer is still needed. Current formal models of music are either incomplete, or highly reductive. Is it possible that simply more rigorous structural analysis may eventually yield formally complete style descriptions, or is there something else missing? Historically, formal models of the compositional process first emerged with Guido D’Arezzo ca. 1026, and included such curiosities as “musikallische wurzelfpez.” The foundation work of H. Schenker, A. Schoenberg, and J. Schillinger has been extended by computer models of composition by L. Hiller, I. Xenakis, and others including M.F. Thomas, K. Ebcioglu, B. Schutz, and K. Roads. Most computer models are of the prescriptive rule-based variety (expert systems) or are probabilistic. Probabilistic systems only adapt distribution functions to a corpus of examples without acting on any deep-level correlations found there. Rule-based systems do not spontaneously generalize knowledge from their input: rules must be consciously deduced through score inspection and introspections, and so are limited to the most simple, well-known, and regular aspects of a style. These techniques do not scale well to larger problems, where ambiguity and parallelism in musical thought predominate. I argue that current approaches to formal analysis of musical style are too limited. Music is best modeled as evaluation not of rules, but of the interplay of “expectancies” on many levels simultaneously. Music is the teasing of sonic expectation. Driving rules or distribution functions with noise is not an adequate model of composing. Neither is composing an act of inscrutable Genius. It can be successfully modeled using connectionist techniques that include notions of learning, expectancy, generalization, default assignment, and graceful degradation.