Music as Biology: The Tones We Like and Why.

Since Darwin, many theorists have pointed to vocal communication as a significant factor in the structure and evolution of music, but Dale Purves' Music as Biology summarizes fairly recent work that has brought this approach to a new level. Anyone seriously interested in questions regarding the origins of music needs to become familiar with the work of Purves and his colleagues—this concise and eloquent book is an excellent way to do that.

Scholars across a variety of disciplines have long recognized relationships between prosodic patterns in affective signals and emotional features of music. But these observations, although interesting, do not typically explain the more intricate characteristics of musical structure. According to Purves, widespread consistencies across the world's musical systems are due, in large part, to perceptual mechanisms shaped by evolution to extract meaningful information from naturally occurring periodic sound stimuli, including most notably, vocalizations.

From this perspective, the author covers the perception of consonance and dissonance in musical intervals, universal predilections for certain musical scales over others, the relationship between intervals and vocal emotions, and tonal preferences across cultures. For example, analyses of spectral slices of spoken utterances, normalized and examined in octave bands, reveal amplitude peaks in spectral distributions that map quite nicely to the frequency ratios of most intervals in the chromatic scale. This strikes me as some of the best evidence ever presented regarding the structural origins of musical systems. It is certainly not the entire story, but likely a major theme. Overall, the chapters are crisp and succinct, predictions for those hypotheses, and summarizations of sound and pitch preferences across societies. People are highly motivated to create communicative music, often in groups, in elaborate cultural contexts; and across most societies, musical aesthetics interact with people's social lives within and across generations. Consequently, music evolves in ways that require explanations beyond proximate generalizations. I doubt Purves would disagree but, in the end, scholars who approach music from a cultural or historical perspective might be unfortunately put off by the apparent reductionism. I would encourage such thinkers to give Purves the benefit of the doubt, as he is sticking to what he knows, and that is cognitive neuroscience. Understanding the nature of music is a long-term, interdisciplinary enterprise—I believe the work described in Music as Biology contributes in a very important way.

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Voice Leading: The Science behind a Musical Art.

Students and masters of musical composition follow a core set of principles in arranging musical ensembles. In this volume David Huron provides the science of why certain core principles of composition result in the qualitative experiences of music listeners. The author systematically takes readers through the core sets of voice leading rules: for each he provides the expectations for how the rule influences perception, generates testable hypotheses for how our sensory system processes music shaped by the rule, predictions for those hypotheses, and summarizes research testing those predictions, with discussion and interpretation. Although we generally take for granted that music sounds good because of compositional approaches, Voice Leading brings a new appreciation to the complexity of our sensory system and the care with which strong composers play to the rules of human auditory perception.

The first three of the book's 17 chapters provide a comprehensive overview, briefly covering: the main principles of voice leading, the operation and limitations of our auditory system, definitions of sound and how it is produced (although Huron focuses on only airborne sound), the formation of sound images and sound localization, the psychology behind the pleasing nature of music, and acoustic versus auditory phenomena. Chapters 4–6 focus on a core set of voice leading principles for Baroque part-writing, and discuss auditory image formation,