



History & Philosophy of Science (HPS) Colloquium

**Thursday, 17 July 2008
2:00 pm in 204 Longmire (LON)**

The Program in the History & Philosophy of Science is proud to announce a talk by Dr. Joseph Travis, Dean of the College of Arts and Sciences and Robert O. Lawton Distinguished Professor in Biological Sciences at FSU. Dr. Travis will be speaking on the multiple causes for patterns in nature.

Abstract:

Evolutionary biologists seek to isolate the explanation for trait differences among species or among populations. More often than not, comparative and experimental studies examine a candidate factor or attempt to distinguish two or three factors. However, in many cases, multiple factors are all playing a causal role; some factors are more "important" than others but the relative importance of factors can vary among situations. For example, we can offer five distinct explanations for the variance in offspring size at birth among local populations of the least killifish; none are mutually exclusive and some are intertwined (i.e. one candidate process actually creates two of the others). The argument to be made is that evolutionary biologists ought to turn our attention to partitioning the variance, that is, delineating the relative importance of multiple agents rather than testing which of several candidates are responsible.

The issue touches upon several aspects of scientific practice. For example, our emphasis on "process" rather than "organism" (successful NSF grants test specific big ideas whose importance transcends the individual study system) perhaps leads to an emphasis on testing individual hypotheses instead of delineating multiple hypotheses. It also touches upon seemingly unrelated problems. For example, one might argue that the adaptive significance of those mutants that increase in frequency from initial rarity relies upon their conferring fitness benefits through several adaptive mechanisms rather than via a single selective factor.

The "change" to be called for is to encourage research programs that partition the variance in trait distribution among candidate mechanism and developing improved ways of conducting comparative studies in order to partition variance rather than simply develop correlations or independent contrasts.