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Sample Short Essay
Phil 3334 ECT

The Evolutionary Contingency Thesis states that, "all distinctively biological generalizations describe evolutionarily contingent states of nature" (46). Or, in more detail, all generalizations about the living world are either 1) "just mathematical, physical, or chemical generalizations (or deductive consequences of mathematical, physical, or chemical generalizations plus initial conditions)" or 2) "are distinctly biological in which case they describe contingent outcomes of evolution" (46-47).

Beatty believes that this thesis is true because of the way evolution works. All living things (and the rules they follow) are the product of evolutionary processes. These states are contingent in the sense that they could have been otherwise. If we "replayed the tape of life" evolution could have led to a different outcome. On top of this, even if evolution did create some rule that is currently universally true, it can break that rule in the future and so no true biological generalizations are necessarily true. He also believes that the fact that so many debates in biology are relative significance debates is explained by the ECT.

Beatty argues that there are no laws of biology. While he admits that it is not clear precisely what a law is, a law at least has to be necessarily true (and exceptionless). Since the ECT entails that there are no distinctly biological generalizations that are necessarily true, there are no laws of biology.

Candidates for laws in biology include things such as Fisher's Fundamental Theorem of Natural Selection as well as more empirical claims such as the species-area law in biogeography. Fisher's Fundamental Theorem says that the "The rate of increase in fitness of any organism at any time is equal to its genetic variance in fitness at that time." Beatty would point out that the claim is ambiguous. There are (at least) two reasonable ways to interpret it. First, we assume idealized conditions such as no mutations (as Fisher does). Then, using Fisher's intended meaning for terms like "rate of increase in fitness" this is indeed a *theorem*. Beatty would say it follows from mathematical truths plus definitions and so is not distinctly biological. If we relax the assumptions, then there are exceptions in which case it will not be a law. The Species-Area law of biogeography states that the number of species of some particular taxon in a specific region (such as an island) increases exponentially with the area of the region. In other words, the relationship is in the form of a power law $S = cA^z$. It is less clear what Beatty would say here. He would surely point out that it will not be exactly true (a single species extinction or speciation event doesn't make it false!) and additionally, there are definite exceptions even to the approximation. The law is perhaps best stated as a 'ceteris paribus' law with unclear background assumptions. I believe that Beatty is right that neither of these examples fit the traditional mold of a law of nature. However, both are useful to know when doing biology (and not so much other disciplines) and can guide research, lead to new insights, and even be central parts of biological explanations. It is merely a semantic question whether to grant them the status of a 'laws'. If we do, there will be many more laws than on more restrictive views and we can no longer rely on laws being exceptionless. On the other hand, we maintain the idea that laws underwrite a wider variety of types of scientific explanations. If I have to choose, I favor this view. Thus the ECT is correct, but yet there are laws of biology.