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Lecture Date: Monday, January 28, 2008

Announcements:

- Sign up on Blackboard.

I. Levels of organization

A. Composition

1. What most people confuse are the complexity of interactions at a given level of organization with levels of organization.
2. These levels of organization tell us the size scale but don't tell us how interaction works among the levels.
3. Complexity is defined as the number, strength and kinds of interactions within a system.
4. As we get into biological systems, it becomes more complex as the size and scale increase.

B. Composition x Complexity

1. As interactions increase, we go up the scale of composition but then go back to things like planets and galaxies. We see a drop in the complexity of interactions.
2. Complexity doesn't necessarily correspond to composition.
3. As things get bigger, the time scale gets longer. Galaxies tend to last much longer than cells. Things of higher levels of organization outlast constituent parts.

C. Composition x Time scale of processes

1. As we go up the line into different niches where development can take place, development itself is subject to evolution and change.
2. Phylogenetic processes involve more complexity than lower level processes.

II. Development

A. What is development?

1. Habitat is an "address," or where you are (e.g. as a student, our habitat is Cornell).
2. A niche is an "occupation," or the functional relation between an organization's capacities and the environment. What is the fit between what we're capable of doing and what are the developmental challenges in a period of time?
3. Development is a series of adaptive changes to a series of environmental challenges.
 - a) Organism and environment can change one another.
 - b) Niche construction: through mutual modifications, new relationships can emerge over developmental time. Your job is not just something handed down to you; your abilities at "time 1" affect your abilities at "time 2."
 - c) This parent-infant interaction affects the way baby learns and will affect future relationships with not only the caretaker but also with other people.