Name: _____

Exercise C6/D0, 11/16/04

Complex Systems

As we have been discussing in this course, almost all interesting/important systems, phenomena, and problems are "complex." To be able to deal with such problems, we need to practice analyzing complex phenomena and applying principles underlying these phenomena. The ability to solve well-defined problems, often found in many textbooks, does not automatically extend to real-world problems.

Complex systems, be it natural or man-made (including physical, biological, cognitive, social, cosmic, etc.), typically exhibit the following mutually related properties:

- Holistic: The whole is greater than the sum of its components (e.g., mind from the brain). Cf. "reductionism," which expects to understand the whole by analyzing smaller and smaller components (e.g., academic disciplines).
- Interactive: In a realistic complex system, every components/agents interact with everything else, directly or indirectly (e.g., society).
- Self-organizing: Even without "higher-level" control/design, complex systems tend to behave in an organized manner (e.g., "secure" child-caregiver interaction).
- Sensitive to the initial conditions: A slight change at the beginning can lead to a huge difference at the end (e.g., any regretful moment of yours).
- Emerging: Some unexpected/unpredictable/surprising property may appear (e.g., "swarm intelligence").

Task: Choose one of the following options and write a concise, *individual* report (free format) reflecting your experience in this exercise. Regardless of your choice, try to examine the above-mentioned properties of complex systems. Also prepare to *casually* discuss your report in class (i.e., no need to prepare a formal presentation).

Option A Field work: Observe and analyze at least one *new* example of complex system. That is, find an example not discussed in class.

Option B Reading: Read Text Chapter 6 "State of Mind." You may also want to read pages 204-207 "Reflections" as a summary of Chapter 5 "Representations."

Option C Video: Watch the entire "The Sacred Balance" (4.5 hours including commentary). A single copy of video will be available and handed to a coordinator. Students who are interested in this option must arrange one or more viewing events by themselves. Note that there is a web site for this program (http://www.sacredbalance.com/).

Instructions/Notes:

1. Follow the general take-home exercise guidelines (as in previous modules). ☐
2. If you worked in a group (or watched the video together) for this exercise, list the names of the group members.

   _____

Survey: Time spent between classes: _____

// End