

Reflection Questions 7

Due by 3:00 pm , Wednesday March 15.

Please submit by Dropbox

Tainted, Chapter 2, "Discovering Dump Dangers."

In the 1990s, the U.S. Department of Energy commissioned a feasibility study to determine whether Yucca Mountain is a suitable storage site for radioactive waste. This chapter argues that this study conducted a number of logical fallacies, which could perhaps have been detected using better logical reasoning.

1. The argument from ignorance.
 - a) First, please explain in general terms what is the argument from ignorance and why is it a fallacy.
 - b) On page 23, Shrader-Frechette cites a few statements from the DOE report on Yucca mountain. She notes that these statements commit the fallacy of arguing from ignorance. Using one of these examples (of your choice), please reconstruct the reasoning of the DOE so that it is obvious to see how the fallacy of arguing from ignorance was committed in these examples.
2. Affirming the Consequent
 - a) The author describes this fallacy at the top of page 26. In a short paragraph, please explain why is the inference about the effects of landscape features at edge populations guilty of affirming the consequent?

Shrader-Frechette claims that, "DOE Yucca scientists likewise affirm the consequent whenever they claim that hypotheses about Yucca ground water-travel times are "verified," and thus meet "regulatory requirements," merely because their testing shows the predictions' *consistency* with the hypotheses." (p. 26). But as we read on, the story gets a little more complicated. It is complicated by the fact that "verification" and "validation" have two different meanings. It is further complicated by the fact that verification of an algorithm is very different from verification of a program (e.g. a computer simulation).

- b) What is the difference between the verification of an algorithm and verification of a program?
- c) The DOE claimed to have both verified and validated their simulation of Yucca Mountain. Why was this statement misleading?
- d) At the end of Chapter 2, the author asks the rhetorical question: are scientists stupid? The real question is how such seemingly obvious fallacies could be committed by such smart people. Perhaps this can be explained as a breakdown of the notoriety based reward system that we discussed in class last week. In a short paragraph, please draw on that model of science to provide a possible explanation of what went wrong at Yucca mountain.