Preview Questions

1. What is Firestein’s view of science?
2. What does it mean to “pursue ignorance”?

Reading Summary

* Science works like trying to find a black cat in a dark room with the possibility that there’s no cat in the room at all (i.e., fumbling, bumbling, and stumbling).
* People generally think of science as a well-ordered process (i.e., rule-based scientific method).
* Science is more than just collecting data and facts and documenting them.
* Scientific discourse is analogous to a group of colleagues talking over a few beers; it focuses on what is NOT known rather than what is known (i.e., the ignorance but not in the pejorative sense).
  + Ignorance in the sense of gaps in knowledge.
* “Thoroughly conscious ignorance is the prelude to every real advance in science.” (James Clerk Maxwell)
* To deal with all of the facts that science accumulates, scientists employ a kind of controlled neglect.
* Knowing a lot of facts does NOT make you a scientist; that’s not the point.
* The purpose of knowing a lot of facts is to help you focus on the ignorance that’s relevant.
* Most models of science are all based on a large body of facts that can be gathered completely (ignorance -> facts -> knowledge).
  + Jigsaw puzzle that reveals some grand scheme.
  + Peeling back an onion.
  + The iceberg analogy.
* Alternative models of science
  + A magic well in which no matter how many buckets you take out, there’s always another bucket of water to be had.
  + Ripples on ponds that are ever expanding.
* “Science is always wrong. It never solves a problem without creating 10 more.” (George Bernard Shaw)
  + Question propagation
  + Knowledge -> facts -> ignorance
* Negative relationship between what you know and how much you know about it (e.g., Bachelors versus Ph.D.)
  + Instead frame as negative relationship between what you know and what you can ask about it.
* Education can no longer just be about delivering facts given that you can very quickly find just about any fact from Google or Wikipedia.
  + The business model for universities and secondary schools will be forced to change.
  + Current education system is very efficient at dampening students’ interest in science.
  + You get what you screen for; current educational testing is more about screening and less about evaluating.
  + New approach to testing: “Here’s the answer. What’s the next question?”