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21L.017 The Art of the Probable: Literature and Probability  
Spring 2008

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This list of questions is a compilation of all the questions drawn from different instructors.

1. Throughout this term we have been juxtaposing scientific and philosophical texts that bear upon the development of mathematical probability with works of literature. Focusing on one or more of the literary texts from Dostoevsky onwards, write an essay that reflects upon the relationship between literature and probability in this context. Your essay should have a clear argument, backed by evidence; it should be alert to the complexities of such relationships, thinking in particular not just of how science and philosophy may influence literature, but of ways in which literary texts may catch up or expand upon or even anticipate implications often inexplicit in the scientific and philosophical paradigms upon which they draw.
2. A central problem in probability at least from Hume onwards concerns induction. Hume, Bernoulli, Bayes, Laplace, and Peirce, to name the most obvious, are all centrally concerned (albeit in different ways) with the question of how one draws inferences based on observation, and with the implications of inductive reasoning for thinking about the natural and social world. Through careful analysis of one or more of the literary texts we have read from Dostoyevsky through Stoppard, develop an argument for how the problem of induction is taken up by the literary work(s) you choose. In what ways do literary texts reflect upon the limits of inductive or inferential knowledge?
3. Recall Darwin's statements at the conclusion of our excerpt from the *Descent*, in which Darwin suggests that the cause of human advancement would be served if we learned to attend to the way that we breed human beings as much as we attend to the way that we breed livestock. In the next-to-last paragraph, he considers whether intelligent, prudent people will not be periodically overrun in numbers by stupid, imprudent people if attention is not paid to this issue. This idea is connected with the notion of a feedback mechanism involved in natural selection. Give a careful account of the mechanism, using the following questions as a guide: (1) how does the idea of a feedback mechanism affect the notion of a "balance of nature"? (2) does Darwin's worry about human advancement follow legitimately from his theories? (You may, if you wish, include the following question as well: (3) what contribution did Francis Galton make to the consideration of this problem?) Feel free to use the literary texts from Dostoevsky to Stoppard to provide illustrations.
4. Darwinian themes are scattered throughout Wells's *The Island of Dr. Moreau*. Write a coherent essay that examines their significance for the novel. The following questions might help you get started: The idea of chance figures importantly—where does it come in and is it the Darwinian idea or something else? Moreau has often been identified as a kind of allegorical figure, representing Natural Selection, but, of course, Moreau thinks and makes decisions, where Natural Selection does not. How adequate, then, is the identification?

5. Discuss the relation between the first section of *Notes from Underground*, with its semi-philosophic arguments and rantings, to the second, largely narrative section in any way productive to understanding the story as a whole.
6. A maxim acceptable to both Leibniz and Hume—though with different implications for each—might run as follows: “There is nothing in nature that corresponds to the word ‘chance’. Chance is a word that designates only our ignorance, our inability to explain.” How might Peirce respond to this statement? Were we able to resurrect Peirce today and give him Borges’s stories to read, what would he think of them? Were we able to resurrect Borges today and give him Peirce’s on chance to read (assuming he hadn’t done so already!), what would he think of them?
7. Explain the value of the word “normal” in the thinking of Quetelet. How does it function in relation to the ambition of nineteenth-century thinkers to discover the most important regularities of nature? How does it function in relation to Quetelet’s notions about human progress? How does it function in relation to his ambition to direct legislation to the improvement of society? How well adapted are Quetelet’s theories about the normal and the average (and his ideas of social improvement) to our own time? Or, for the last question, you may wish to substitute the following: How does Dostoyevsky’s *Underground Man* or Pynchon’s *The Crying of Lot 49* represent a challenge to Quetelet’s entire line of thinking?
8. Laplace ends his book on probability with the following statement (amended slightly from your translation): “It is seen in this essay that the theory of probabilities is at bottom only common sense reduced to calculation; it makes us appreciate with exactitude that which exact minds feel by a sort of instinct while often being unable to give a reason for it.” Examine how well this principle applies to the cases that Laplace discusses in the argument leading up to it, and how it might be viewed by any other writer or writers that we have read this term. You should focus on writers from the last third of the term, though you are permitted to call upon earlier writers if you need to.
9. Images abound over the course of our readings of sequences of things that may reveal at length a pattern in apparent disorder, and these patterns are sometimes associated with messages, buried by chance or concealed by design. In this connection, either
- discuss how Mallarmé’s “A Throw of the Dice” and/or one or more of the Borges stories you have read juxtapose the presence of randomness and order, paying careful attention to the ways in which randomness and order are represented in each. You might wish to consider, too, the use made in each of the idea that a random sequence becomes orderly if it repeats itself. Or,
  - Discuss how Borges’s “The Library of Babel” juxtapose the presence of randomness and order, noting the use made of the idea that a random sequence becomes orderly if it repeats itself. Consider as well that the narrator of “The Lottery in Babylon” describes the institution as introducing “a general theory of chance” in the whole of social life. How can chance be orchestrated by a secret and omnipotent “Company”, the (disputed) existence of which suggests that chance may be in Babylon but another name for order.

Alternatively, discuss how the theory of alternatives (posited in an ancient and puzzling text by an ancestor of the narrator in “The Garden of Forking Paths” and perhaps rightly decoded by the Englishman Stephen Albert) relates to the Borges’s story itself. What does the narrator mean when he says, near the end of the story, that “the future already exists”?

(c) explore the various ways in which Pynchon’s *The Crying of Lot 49* employs such images (e.g., Oedipa’s fascination with printed circuits that she does not understand, Mucho’s insistence on reading truth out of the rubbish left behind in used cars, Metzger’s movie, whose actual sequence, given the nature of films, cannot be reliably distinguished from a sequence in which the reels have been mixed). Oedipa is the solver of riddles. How clear is it that there is a riddle to be solved? What is the overall point, in your view, of the ambiguities in which the text shrouds the answer to this question? Or, (d) develop an essay that examines how Stoppard’s *Rosencrantz and Guildenstern are Dead* treats this issue. In what ways does Stoppard’s concern with chance and the vagaries of communication constitute a response to Shakespeare’s *Hamlet*?

In dealing with this topic, be mindful that when Galileo said that the language of nature was mathematics, he meant to imply that God had encoded messages for us to decipher in the text of the universe.

10. The narrator of Borges’s “The Lottery in Babylon” describes the institution of the Lottery as introducing into the whole of social life “a general theory of chance.” This phrase at least in part a contradiction in terms, as “pure” chance, so understood by the narrator, could not be regularized and made subject to a “general theory,” much less orchestrated by a secret and omnipotent “Company” – the (disputed) existence of which suggests that chance may be in Babylon but another name for order. Discuss how Mallarmé’s “A Throw of the Dice” and any one of Borges’s stories juxtapose the presence or appearance of chance in the world with either evidence or illusions of order.

11. Many of its initial opponents (as well as critics of Darwinism today) complain that Darwin surrendered the world to the operation of chance. Comment on this view in any way likely to illuminate the role of randomness or chance in Darwin’s argument.

12. Daniel Bernoulli may be seen as challenging Pascal’s notion that when there is as much to be won as lost in a wager (or a course of action) “reason has nothing to say”. At the same time, Bernoulli’s reason is mathematical reason, a matter of quantifying something he called the “*emolumentum medium*” of particular individuals—a Latin phrase usually translated as “average benefit” or “average utility”. Explain the issues involved here. How would Dostoyevsky’s *Underground Man* respond to them? (Or you may choose, if you wish, to discuss instead the response of any other writer read this term.)