

Questions based upon Simon Winchester's "The Map That Changed The World"

Developed by Penn State Earth & Space Science Partnership, 2011

Prologue - What information is included in a geologic map, in what ways is this information useful or significant?

Chapter 1 - A fundamental concept that underpins the book is relative dating. What does this term mean, and can you describe how relative ages of rocks are determined?

Chapter 2 - The word hours is italicized on page 12. Why does Winchester emphasize this word?

Chapter 2 - The footnote on page 15 alerts the reader that a significant fraction of the modern United States population still believes in the church-based time scale and Biblical creation of the Earth that was popular during Smith's time - and that this population is growing in size. Are there similarities between the two cultures (economic, political, and social) that could explain the resurgent belief today?

Chapter 3 - In what ways does the question below (which was asked during the late 18th century) demonstrate the relative youth of the science geology and the discoveries that have been made since the birth of this science?

Chapter 4 - Page 49 has a stratigraphy column of a typical cyclothem. What is a cyclothem? What do stratigraphy columns display? How are they useful?

Chapter 4 - What is an orogeny? How are orogenies associated with sedimentary rocks and the coal beds of England (and Pennsylvania)?

Chapter 5 - What do you suppose can cause the sharp change in bedding that Smith observed from gently sloping to steeply dipping beds with folds?

Chapter 6 - How did industry affect the progress of geology in Smith's day? Are there parallels today, for example with the Marcellus shale exploration and extraction?

Chapter 7 - Smith describes his conversations with the canal company leadership: "... though I was continually talking about rocks and other strata, they seemed not desirous of knowing the guiding principles" (page 96). Does this problem appen in your classroom? What might help bring learners to desire understanding of the guiding principles?

Chapter 8 - What is an index fossil and how are the ammonites drawn at the beginning of each chapter relevant to this term?

Chapter 9 - On page 131, Winchester describes the scientific method as the collection of data, development of a consistent mechanistic model, and verified through testing of predictions. How does this description compare with what is taught and assessed in the classroom?

Chapter 10 - This section and the latter half of the book focus heavily on plagiarism. What do you teach your students about plagiarism? Does it change your opinions to learn the effects it can have on the plagiarized person's life?

Chapter - Speculate on how the process of making geologic maps today differs from the way Smith worked in constructing his initial map of England.

Chapter - Do you remember any specific places in your childhood that had striking geology or where the rocks were important? Do you know whether they were formed through sedimentary processes?

Chapter 13 - "The theory of geology is in the possession of one class of men, the practice in another." How does this quote (p. 228) describe the state of geology in Smith's time? How does it compare to your idea of a geologist today? Compare Smith's reception with the Geological Society of London to the community's response to Wegener's ideas on continental drift.

Chapter 13 - On page 229 there is a curious argument presented by Greenough that facts should be presented without ruminations and theories. In this case, it meant omitting Smith's fossil stratigraphy from the new map of England. Do you agree with his statement?

Chapter 14 - Winchester emphasizes the well-placed connections Smith made that aided him in his work. What are some common qualities of all of Smith's supporters? Do these qualities differ from those of people who today would be considered valued connections?

Chapter 15 - "When house and land is gone and spent/Then Learning is most excellent (quoted on p. 263)." Do you agree with this quote in relation to Smith's life? Why or why not?

Chapter 16 - Both London and Scarborough appear to have great influence over Smith's mood and behavior. What defines a place to make it unique? How was the concept of a place important in this book?

Chapter 17 - What evidence do we see in the book for a societal shift from a strictly wealth-based recognition system to one that was more focused on education and accomplishment? How was Smith affected by this shift in society's view on its people?

Chapter 18 - Did you find the book enjoyable even though it was heavily based in scientific discovery? How did the book enhance your understanding of geology?