

Study questions for [MS] Chaps 1-2.

Introduction

1. What is Whig History?
2. What is the "long 19th century"?
3. How do Marsden and Smith define interpretive flexibility?

Chapter 1

4. What were some cultural values of the scientific revolution and the enlightenment?
5. What were some reasons contributing to the adoption of Greenwich Mean Time as an internationally accepted basis of the world's time zones?
6. What was the Longitude Act of 1714?
7. What does "BAAS" stand for? How did the organization of the BAAS reflect attitudes towards theoretical and practical science?
8. What was "chartism", as associated with the BAAS?
9. What were the goals of William Whewell's "Magnetic Crusade"?
10. What was an early problem concerning the credibility of iron-hulled steamships?
11. Why were engineering projects (like steamships, railways, and telegraphs) referred to as "experiments" by their projectors?
12. What were some characteristics of "gentlemanly" geology?

Chapter 2

13. What were some cultural values of the 18th century Scottish enlightenment with respect to "labour" (or "work")?
14. What was James Watt initially trained as?
15. What did Watt's modification of the Newcomen steam engine consist of?
16. When did Watt obtain a patent for his modification of the Newcomen steam engine? When did he get into the business of manufacturing steam engines?
17. Why was it important in the late 18th century to present public displays of steam technology?
18. According to Marsden and Smith, was steam technology inevitable? Why or why not?
19. What was the "gaz" engine?
20. What were "atmospheric" engines? What were some alleged advantages of atmospheric engines over steam engines?
21. What were some worries about electromagnetic engines voiced at the 1840 BAAS meeting?
22. According to Marsden and Smith, what was one aspect of the failure of the challengers to steam engines?
23. What is the analogy for Watt of Newton and the apple?

Study questions for [MS] Chap 3.

1. Why do Marsden and Smith claim that there was no assurance in the mid-19th century that steamships would prevail over sail?
2. Where is the River Clyde? The River Thames?
3. What were some of the reasons for the resistance at the 1854 Liverpool BAAS meeting towards John Scott Russell's and Islamabad Kingdom Brunel's "great ship" project?
4. What was the ultimate fate of Brunel's steamship *The Great Eastern*?
5. According to Marsden and Smith, what role did Presbyterianism play in the rise to dominance of the shipyards along the River Clyde?
6. How did the Cunard Steamship Company differ from its competitors?
7. According to Rankine, on what does the efficiency of a heat engine depend?
8. Why didn't "projectors" invest in air engine projects, even though they were advocated by credible personalities (like Napier and Rankine)?
9. What was significant about John Elder's compound steam engine of 1854?
10. According to Marsden and Smith, what are some problems with standard accounts of steamship histories that claim more efficient steam engines were needed before steamers could displace sailing ships?
11. What were some similarities between the Unitarian culture of Liverpool ship-owners and the Presbyterian culture of Glasgow ship-owners and ship-builders?
12. According to Marsden and Smith, what drove Alfred Holt's desire to eliminate waste in his shipping line?

Study questions for [MS] Chap 4

1. What were some of the "cultural systems" constructed by railway investors in the 19th century?
2. According to Marsden and Smith, besides railways what were some of the imagined transport possibilities in the early 19th century?
3. What were some projected advantages of transport by fixed rail over transport via steam coach?
4. Why did George Stephenson adopt a 4 ft. 8/5 in. gauge for his fixed rail system on the Stockton and Darlington railway?
5. According to the 1829 report of the new Liverpool and Manchester Railway (L&MR), what were some chief contenders for transport on its fixed rail system?
6. What were some of the ways that Marsden and Smith suggest the Rainhill trials were rigged in favor of Stephenson's *Rocket*?
7. According to Marsden and Smith, did the L&MR constitute the fixed and final template for all subsequent railways? Why or why not?
8. Why did I. K. Brunel adopt a 7 ft. gauge for his Great Western Railway (GWR)?
9. What were some characteristics of the distinct GWR "culture"?
10. What is significant about the failure of Brunel's construction of an atmospheric line on the South Devon Railway?
11. According to Marsden and Smith, was the Gauge Act of 1846 that imposed the narrow gauge on all new railway lines based entirely on technical considerations? If not, then how was the choice made?
12. What are some of the cultural motifs in 19th century railway art?
13. In what sense did literary railway culture construct a "art of seeing"?
14. What were some of the new social spaces constructed by 19th century railway culture?
15. What were some 19th and early 20th century American railway innovations?
16. What was the concern of Charles Francis Adams critique of railway culture?
17. What was the "all red" route around the world?

Study questions for [MS] Chap 5, Conclusion

Chapter 5

1. Marsden and Smith say their goal is to understand the simultaneous creation of a stable role for the telegraph and an authoritative role for its advocates. In what sense does this involve "the fashioning of engineers and their artifacts"?
2. What was the "tachygraphe"?
3. What was the Ecole Polytechnique?
4. What were some of the old and new forms of technology on which Chappe's telegraph system was based?
5. On what did optical telegraph lines in France and other nations initially depend for their credibility and stability?
6. What was the outcome of Francis Ronalds initial proposal in 1816 to the British Admiralty of a new electric system of telegraphy?
7. What did Hans Christian Oersted demonstrate in 1820?
8. What was the outcome of Charles Wheatstone's and William Cooke's proposal in 1837 to the London and Birmingham Railway to use their 5-needle electric telegraph to transmit long-distance signals?
9. Why did Cooke suspend his wires from iron poles for his electric telegraph system for the Great Western Railway? In what sense did this become a symbol of progress?
10. What was significant about the announcement by telegraph of the birth of Prince Alfred and the capture of the poisoner John Tawell?
11. Was Samuel Morse a trained electrical engineer?
12. What is gutta percha and what was it used for?
13. What was the fate of the 1857 trans-Atlantic telegraph cable?
14. What was the fate of the 1858 trans-Atlantic telegraph cable?
15. What was the fate of the 1865 trans-Atlantic telegraph cable?
16. What was the fate of the 1866 trans-Atlantic telegraph cable?
17. What were three functions of William Thomson's laboratory at the University of Glasgow during the 1860s?
18. What was the difference between the absolute system of units adopted by the BAAS Committee on Standards of Electrical Resistance and the absolute system used by Wilhelm Weber?
19. What political conclusion did William Thomson draw in 1887 from the fact that Dublin and London could communicate at the rate of 500 words per minute using the new telegraph technology?

Conclusion

20. What are some of the "cultures of technological expertise" that Marsden and Smith suggest played fundamental roles in generating, promoting and sustaining engineering projects associated with steam power, steamships, railways, and telegraphs?
21. According to Marsden and Smith, what was one of the most important mid-19th century shrines of "technological tourism"?
22. What was an alternative to the legitimate insiders' view of technological tourism?
23. What were some roles of technological show-spaces, both inside and outside the university?
24. What two cultures did technological exhibitionism bring into conflict?
25. According to Marsden and Smith, how did "in-house" training justify the British economic preference for free enterprise?
26. Why was the reception in the late 1830s and 1840s of academic courses for engineers "complex"?
27. Who were the "Smeatonians"?
28. Was the "popular science" that emerged in the middle third of the 19th century just a diluted or dumbed-down form of "elite science"? Why or why not?
29. According to Marsden and Smith, in what sense did the mission of empire include a religious mission?
30. Was gentlemanly status a mark of a good engineer? Why or why not?