

Study Questions for Hunt (1991) *The Maxwellians*.

Chapter 8

1. What role did Hertz play in establishing Maxwell's equations?
2. What was one of the most difficult and fundamental questions in Maxwellian theory that FitzGerald and Heaviside worked on in the 1890s? (Where was Heaviside living at the time?)
3. What is the FitzGerald contraction hypothesis?
4. According to Hunt, what was the significance of the letter Thomson wrote to Heaviside in 1888? What was Thomson's challenge to Heaviside in this letter?
5. What was the form of the expression Heaviside derived in 1880-81 for the force on a charge moving in a magnetic field?
6. According to Heaviside's 1888 formula, what happens to the electric field of a moving charge?
7. According to Hunt, did FitzGerald know about Heaviside's result by early 1889?
8. How did Lodge and Heaviside view the null result of the Michelson/Morely experiment?
9. How did the FitzGerald contraction hypothesis explain the null result of Michelson and Morely?
10. According to Hunt, was FitzGerald's explanation of the Michelson/Morely experiment a purely ad hoc hypothesis?
11. Why is FitzGerald's explanation now referred to as the FitzGerald-Lorentz contraction hypothesis?
12. According to Hertz, what was Maxwell's theory? According to Hunt, what was Hertz's motivation for this view?
13. What was the heart of Maxwell's theory for British Maxwellians?
14. What characterized Cambridge followers of Maxwell? Did Heaviside approve of this trait?
15. What was Heaviside's definition of a Maxwellian?

Chapter 9.

1. According to Hunt, Maxwell's theory gave an excellent account of purely field phenomena, but what was missing?
2. How did Maxwell's theory treat matter?
3. In Larmor's appropriation of MacCullough's aether, how are magnetic force and electric force represented? How are atoms represented?
4. What did Larmor's theory predict about light in a magnetic field?
5. What was "Kelvin's Paradox"?
6. In what sense had the Maxwellian story come full circle between 1879 and 1894?
7. In Larmor's theory, what replaced the usual "Maxwell stress" in the ether (a tension along the lines of force combined with a lateral pressure)?
8. According to Larmor, how do the electric and magnetic fields "get a grip" on macroscopic currents?
9. What did Larmor propose in response to FitzGerald's prodding to put something in his vortices for the field to grab onto?
10. How did Larmor's new electron theory describe electric convection currents?
11. How did Larmor's electron theory describe electric displacement?
12. According to Hunt, what was Larmor's characteristic strategy and his great departure from traditional Maxwellian theory?
13. How did Lorentz's view of electrons differ from Larmor's?
14. What was Larmor's force?
15. How did FitzGerald assimilate electrons into Maxwell's theory?
16. How did Heaviside assimilate electrons into Maxwell's theory?
17. According to Hunt, what was the core of Maxwellian theory? Was this core disrupted by the introduction of the electron?