

Reading Assignment 8: Pascal and Boyle

ASSIGNED READING

- Pascal. Excerpt from “Story of the Great Experiment on the Equilibrium of Fluids.” In M. Oster. *Science in Europe, 1500-1800: a primary sources reader*. Palgrave, 2002. Pages 133-135.
- James Conant. “Robert Boyle’s Experiments in Pneumatics.” In J. B. Conant. *Harvard case histories in experimental science*. Vol. 1. Harvard University Press, 1957. Pages 1-22, 38-42, and 57-62.

DUE DATE

Please bring a typed, hard copy of your answers to class on Tuesday, January 31st, 2017.

TECHNICAL REQUIREMENTS

Answer questions one, five, seven, and eight below. Together, your answers should not be longer than a single typed page. Remember to provide page numbers indicating which passages you are paraphrasing. For the remaining optional questions, please write down the page numbers on which the authors address the question.

QUESTIONS

1. In *The Story of the Great Experiment*, Pascal fills two tubes with “quicksilver” (i.e., liquid mercury) in order to create two identical copies of what we would now call a “barometer.” In no more than a paragraph, summarize the experiment Pascal conducts and its results.
2. What is a Torricellian vacuum?
3. How did Toricelli and Pascal explain the column of mercury below a Torricellian vacuum? Contrast their answer with the accepted theory (deriving from Aristotle’s views on vacuums) of their time.
4. Suppose a half-domed glass is placed around a Toricellian barometer on a table. According to Toricelli and Pascal’s critics, why should the column of mercury fall, and how did Toricelli and Pascal respond to this criticism?
5. How does Conant explain the accuracy of Perier’s readings in Pascal’s experiment?
6. According to Conant, which four *broad* working hypotheses do Boyle’s experiments test? For which hypotheses do his experiments provide evidence?
7. What reasons does Boyle offer in defense of his prolixity?
8. Explain why Boyle’s first experiment provides evidence for Pascal and Toricelli’s hypothesis.
9. Does Boyle the failure of his experiment to detect a substance “more subtle than air” refute plenists, like Descartes? Explain in no more than a paragraph.
10. Boyle discusses two ways in which air might be composed that would explain why it’s compressible. Summarize the first.
11. In no more than a paragraph, discuss one reason that the formation of the Royal Society was significant, according to Conant.

REFERENCES

- [1] J. B. Conant. *Harvard case histories in experimental science*. Vol. 1. Harvard University Press, 1957.
- [2] M. Oster. *Science in Europe, 1500-1800: a primary sources reader*. Palgrave, 2002.