Philosophy 167: Science Before Newton's PRINCIPIA

Assignment for October 21

Descartes' Principia: Laws of Motion

Reading:

Descartes, Principia Philosophiae, Part II completely.

---- Part III, Articles 1-30.

---- Part IV, Articles 23-26, 133-139, 145-165.

Questions to Focus On:

1. **Descartes, in sharp contrast to Galileo, treats the question of whether a vacuum does or can exist as a conceptual issue, and not an empirical issue. How, if at all, does his proof that a vacuum is impossible fail to end the issue?**

2. **Descartes asserts that there is always an equal quantity of motion in the universe. What does he mean by this "conservation principle"? What evidence does he offer for it?**

3. **Descartes proposes three laws of motion in Articles 37 to 42 of Part II. How are these laws related to Newton's three laws of motion? What evidence does Descartes offer in support of them?**

4. **Articles 45 to 53 of Part II lay out "rules" for determining what will happen following the impact of two objects. What is the point of these rules? Are they simply logical consequences of the laws, or do they involve further assertions? How does Descartes propose to reconcile the rules with what would appear to be commonplace counterexamples in our everyday experience -- e.g. in billiards?**

5. **The basic explanation for planetary motion laid out at the beginning of Part III asserts that the planets are borne along by vortices in an unseen fluid. What grounds does he provide for this? Does he consider it a mere conjecture?**

6. **The excerpts from Part IV concern Descartes's theories of gravity and magnetism -- theories that look like the most rank sort of unfounded conjecture to us. Why did Descartes look upon them as something other than mere conjecture?**