

**HIST 1112****Western Civ 1600s – 1800s****Instructor: Arlin Nikolas****MSCTC – Fergus Falls****Notes Before 2nd Exam****3/2/2009**

## The Intellectual Revolution

- 1. The Scientific Revolution
  - Two books played a large role in the Scientific Revolution:
    - 1. On the Revolutions of the Heavenly Spheres by Nicholas Copernicus
      - People *knew* that we lived in a geocentric universe.
        - Geocentric = earth-centered
        - Reasons for this belief:
          - 1. Common sense said the geocentric theory was true.
            - Earth doesn't feel like it's moving, while the sun does look like it's moving.
          - 2. Aristotle said the geocentric theory was true.
            - Aristotle “held a monopoly” on knowledge and many people believed his words as the definitive truth.
          - 3. Religious groups said the geocentric theory was true.
      - Copernicus said that people were wrong and that the earth revolved around the sun.
    - 2. On the Structure of the Human Body by Andreas Vesalius

## William Harvey

- William Harvey was a doctor.
- He was the personal doctor to the Stuart family.
- People *knew* that blood circulated only one time through the body before being passed.
- William Harvey mathematically proved that blood must recirculate.
- He wrote a book about it called On the Motion of the Blood.

## Tycho Brahe

- Tycho Brahe was an astronomer.
- He noticed a new star.
  - People *knew* that nothing in the sky ever changes.
  - Tycho Brahe wrote a book called The New Star about the star formation he witnessed.
    - In the book, he said that changes do occur in the “heavens/sky.”
- People also *knew* that everything in the sky is perfectly spherical.
  - Tycho Brahe discovered that not everything in the sky is perfectly spherical.
    - He saw a comet that wasn't perfectly spherical.

## Johann Kepler

- Johann Kepler was the assistant to Tycho Brahe.

- He...
  - 1. ...observed Mars.
    - He plotted its location every night.
    - He found that Mars moves in an elliptical orbit.
  - 2. ...discovered that the closer a planet is to the sun, the less time it takes that planet to move around the sun.

### Galileo

- Galileo was a giant within astronomy.
- He...
  - 1. ...discovered the rings of Saturn.
    - Galileo named the rings after benefactors of the college where he taught.
  - 2. ...discovered that the moon has craters.
    - He called these craters “irregularities.”
    - From this, he said that the moon is not perfectly spherical.
  - 3. ...said that Copernicus was right about the earth moving around the sun.
  - 4. ...discovered that Jupiter has moons.
    - Galileo found 3 moons at first, then, later, a 4th.
    - People *knew* that the only planet with a moon was Earth.
      - Religious groups taught that the fact that Earth was the only planet with a moon was a sign from God of how special and unique we are.
      - The Catholic church told Galileo to recant if he wanted to live.
      - Galileo did recant and lived.
  - 5. ...discovered that objects fall at the same rate of speed, regardless of their weight.
    - People *knew* that the heavier an object was, the faster it would fall.

### Math

- Math is the “language of science.”
- Math became the “language of science” during the Scientific Revolution.

### Girolamo Cardano

- Girolamo Cardano popularized 2 basic concepts:
  - 1. The negative number
  - 2. The imaginary number
- He wrote about them in a book called The Great Art.

### Blaise Pascal

- Blaise Pascal developed the laws of probability.
- He also developed a religious suggestion called “Pascal's Wager.”
  - Pascal's Wager said that there are 2 possibilities: God exists or God does not exist.
  - Pascal's Wager said that, in life, we bet between the two possible outcomes.

Eternal Outcomes		
	God Exists	God Doesn't Exist
Live as though God exists	Heaven	Nothing
Live as though God doesn't exist	Hell	Nothing

- Pascal's Wager said that it was more reasonable to believe in God because the “payoff” of heaven or nothing is better than the payoff of hell or nothing.

### Renee Descartes

- Renee Descartes created analytic geometry.
- Renee Descartes saw a separation between science and religion.
  - He decided to show that it's possible to be a person of science and religion.
  - He was going to prove the most fundamental concept of religion using science.
  - This fundamental concept was that God exists.
  - Renee Descartes wrote a book called Meditations.
    - In this book, he used methodological doubt.
      - Methodological doubt = using skepticism to find truth
      - Skepticism = doubting of the truth
      - So methodological doubt is doubting supposed truths to find Truth.
    - Renee Descartes made a list of everything that he thought he knew was truthful.
    - He was going to see if he could doubt the truthfulness of the claims.
    - If he could find **any** reason to doubt that the claim was truthful, he would reject the claim.
    - He wanted to find the things that are undoubtedly truthful so that he could use them to prove God's existence.
    - Renee Descartes used 2 theories of methodological doubt:
      - 1. Dream theory
      - 2. Evil genius theory
    - In the end, only 1 claim is not rejected: “I think.”
    - He used this claim to reason, “I think, therefore I am.”

### Isaac Newton

- He...
  - 1. ...explained *why* objects fall at the same rate of speed (as was first discovered by Galileo).
    - He developed the laws of gravity.
  - 2. ...developed calculus.

### Significance of the Scientific Revolution

- 1. Provided the foundation of modern science.
- 2. Lead to a rise of skepticism.