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The purpose of this document is to point a historical scientific error.  
Only documented scientific and historically accurate statements are used.

## CHAPTER 0

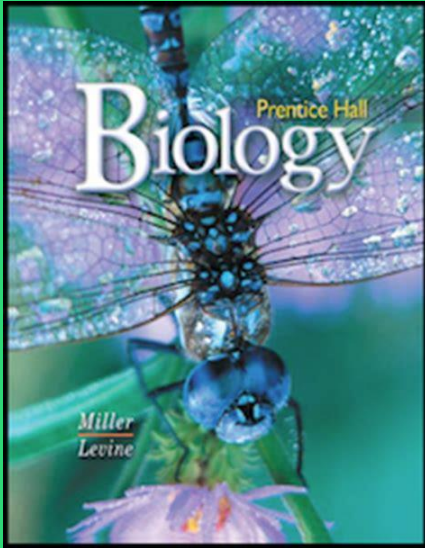
# Teaching Children by Reason



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## What Does The Textbook Teach?



The textbook is going to teach that science is filled with open debate and discussion about new ideas.

It will also teach that any new ideas are rigorously tested to find out if they are valid and then accepted by the mainstream science publications.

## Section 1

### Why Do We Wash Our Hands?

We all know that it is a good idea to wash your hands, but did you ever think to ask why this exercise came into practice?

Ignaz Semmelweis (Figure 0.1.1) was a doctor at Johns Hopkins School of Public Health. There, doctors frequently worked with cadavers before delivering babies in the maternity ward (Figure 0.1.2).



Fig. 0.1.1 Ignaz Semmelweis



Fig. 0.1.2 An obstetrician.

Women would very often die.

Obviously, the mortality rate was quite high because of working with dead bodies and the diseases present.

One day, Dr. Semmelweis made a radical suggestion:

*Doctors should wash their hands with soap and chlorine after dealing with cadavers (Figure 0.1.3).*

The practicing doctors were appalled at this suggestion because it seemed to imply that they were passing on illnesses to women.

However, despite opposition, the doctors that began implementing this practice had a much lower mortality rate.



Fig. 0.1.3 Washing hands with chlorine.

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**While his idea saved countless lives and was supported by the governing bodies at the time, a conference of German physicians rejected the hand washing doctrine.**

**He was publicly berated and made many influential enemies.**

**It was not long before doctors began giving up the practice of hand washing. Opposition from his colleagues caused Semmelweis to lose his job.**

**He kept trying to convince doctors but had varying levels of success on his own.**

**Just because the majority of scientists do not believe in a new or revolutionary idea does not make it untrue.**

**Just because the scientists do not understand everything about the science does not make it false.**

**It is the responsibility of those in academia to teach what is scientifically accurate above all else.**

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## Section 2

### What Is In Our Drinking Water?

The belief of an imbalance in the four humours (Figure 0.2.1) was done away with after the Middle Ages as an explanation for disease. The practice of blood-letting was very common before this theory was revoked.

Scientists rejected the four humours because of scientific debate and discussion. Miasma Theory soon came about as a new explanation for

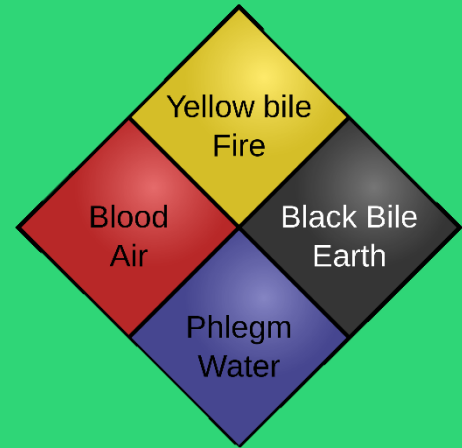


Fig. 0.2.1 The Four Humours



Fig. 0.2.2 A doctor's mask for Miasma Theory

disease. Miasma Theory postulated that poisonous or bad air was the cause of all disease. The Black Plague was thought to be spread through the air. Doctors even wore special masks (Figure 0.2.2) in response to Miasma Theory.

In the 17<sup>th</sup> Century the first microscopes (Figure 0.2.3) allowed scientists to find microscopic organisms. Some suggested that these organisms were the cause of some types of disease.

However, many in the scientific community rejected the notion of germs and stuck to their belief in bad air.



Fig. 0.2.3 An early microscope

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**The supporters of Germ Theory were determined to prove Miasma Theory wrong.**

Dr. John Snow (Figure 0.2.4) was one such doctor. After examining all of the data available, Snow was convinced that the illness was caused by an infected water supply (Figure 0.2.5).



Fig. 0.2.4 Dr. John Snow



Fig. 0.2.5 Filthy water

When Cholera came to the Soho region, he found that most of the deceased had lived near a water pump. Since Germ Theory would not be accepted, he suggested that it was a toxin in the water and not the air that caused the outbreak.

City officials still refused to accept his idea even after shutting off the pump caused the number of cases to drop substantially.

Today, Dr. Snow has been vindicated, but so many scientists and government officials refused to listen to him.

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## Section 3

### A New Model of the Universe

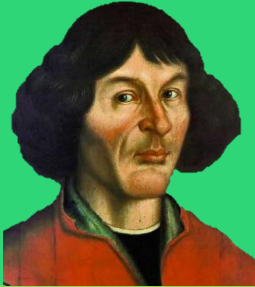


Fig. 0.3.1 Nicholas Copernicus

Nicholas Copernicus (Figure 0.3.1) was famous for putting forth the idea that the Earth is not at the center of the universe. This view was further supported by the

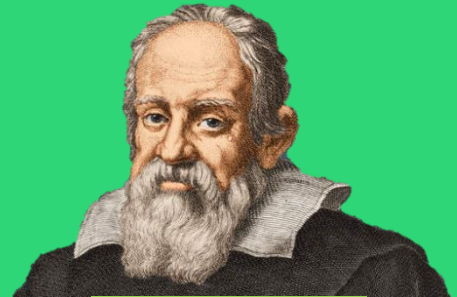


Fig. 0.3.2 Galileo Galilei

observations of Galileo Galilei. (Figure 0.3.2)

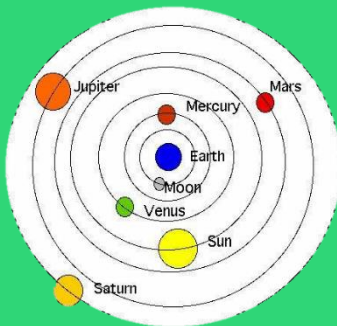


Fig. 0.3.3 A geocentric universe

The most common telling of the so-called Galileo Affair is that he disrupted the views of the Catholic Church that held that the Earth was at the

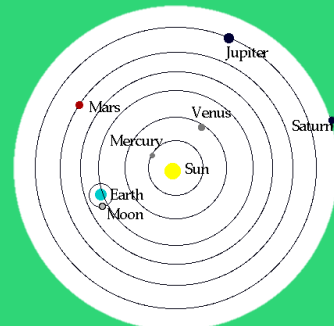


Fig. 0.3.4 A heliocentric universe

center of the cosmos (Figure 0.3.3). He, like Copernicus, argued that the Sun was at the center of the Solar System (Figure 0.3.4).

There is no truth to this account of history.

In reality, the Church was very accepting of Galileo, but it was the scientific community that ignored the results and fought to get the Church to call him a heretic.

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**In fact, the scientists at the time fought to keep the teaching that the Earth was at the center of the universe and this made science stagnant.**



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## **In Conclusion:**

**The mere idea that one should wash their hands after performing certain tasks was ridiculed in its time for fighting against what the established scientists held true. (Section 1)**

**Likewise, teaching that there might be harmful organisms that cause disease living within the water supply was fought against to the bitter end. (Section 2)**

**When scientists proposed that the Earth was round and that it was not at the center of the universe, the scientific community fought back. (Section 3)**



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## **Questions for Further Discussion:**

- 1. Why did scientists not listen to Dr. Semmelweis? (Section 1)**
- 2. Why did scientists not listen to Dr. John Snow? (Section 2)**
- 3. Why did scientists not listen to Copernicus or Galileo? (Section 3)**
- 4. What happens when scientists stop debating and asking questions?**
- 5. What other scientific phenomena do you think have been falsified?**

