History of Science: 1700–1900

(36 lectures, 30 minutes/lecture)
Course No. 1210

Taught by Frederick Gregory
University of Florida
Ph.D., Harvard University

In the period 1700-1900, kings and empires rose and fell, but science conquered all, taking the world by storm.

Yet, as the 1700s began, the mysteries of the universe were pondered by "natural philosophers"—the term "scientist" didn't even exist until the mid 19th century—whose explanations couldn't help but be influenced by the religious thought and political and social contexts that shaped their world.

The radical ideas of the Enlightenment were especially important and influential. In this course you see how the work of these natural philosophers prepared the way for the more familiar world of science we recognize today.

Understand Two Centuries of Scientific Discoveries From An Unusually Qualified Professor

To navigate this complex a mix of social factors and scientific knowledge requires a teacher of very specialized background. Trained as both a mathematician and seminarian before receiving his doctorate as a scholar of scientific history, Professor Frederick Gregory brings an unusually apt perspective to the era covered by this course. It was a time when the Church's influences on science were often profound.

Dr. Gregory has organized the course around six main themes:

- inquiries into the history of the cosmos
- investigations into the realm of living things
- the largely successful attempt to break away from occult explanations of chemical phenomena
- the contrasting persistence of occult appeals in explaining natural phenomena
- the proliferation of the number and kind of physical forces discovered and investigated, thereby opening up broad vistas for the future
- the recurring theme of the relationship of God to nature.

In moving back and forth across two centuries, the lectures touch on many of the scientific disciplines we know today, including chemistry, biology, physics, astronomy, paleontology, and others. And they often cover in detail famous experiments and discoveries in areas as divergent as electromagnetism, fossil analysis, and medicine.

Beyond Einstein: Familiar Names, and Some Surprises, Too

You will find names that leap out as familiar, like Isaac Newton, Charles Darwin, Michael Faraday, Louis Pasteur, Max Planck, Antoine Lavoisier, and Albert Einstein.

And you'll meet some of the greatest names in the histories of non-scientific disciplines. These include thinkers as diverse as Immanuel Kant, Johann von Goethe, Herbert Spencer, Samuel Taylor Coleridge, and Thomas Paine, to name but a few. All of them entered the fray to leave their mark on the annals of scientific inquiry.

But you'll also learn about others within this fledgling scientific community whom you may never have encountered before. Do you know about Nicolas Malebranche... Jakob Moleschott... Robert Chambers... Abraham Werner... William Whewell... or a remarkable woman named Mary Somerville?

Though perhaps less familiar than the scientific minds with whom we have grown up, their roles in the developing history of science were equally important.

The Interaction of Science and Society

The discussions of scientific principles always show how science developed and how scientific inquiry influenced, and was influenced by, the culture of which it was a part. Any discussion of such influence, of course, must take into account the impact of religion.

The Church's precepts played a role in investigations in almost every area of natural science, from the mechanical laws that governed the behavior of the universe and the bodies within it to the debate over God's role in embryonic development.

You'll even learn about a ferocious debate over the possibility of extra-terrestrial life that had its roots in the 13th century.

The debate—which Professor Gregory dubs "The Extra-Terrestrial Life Fiasco"—ultimately involved Thomas Aquinas, the papacy (more than once), Thomas Paine, and the Master of Cambridge University's Trinity College.

Captivating Portraits of an Era and Its People

The debate is just one of many episodes that amplify the themes of the course and are simply fascinating in their own right, conveying a vivid portrait of an era and the people who helped shape it.

You'll learn how:

- the already raging firestorm over the possibility of evolution led Darwin to delay publishing his own findings
- the poet Samuel Taylor Coleridge was involved in coining the term, "scientist"

- the self-educated daughter of a British naval officer became a major scientific authority in Victorian Britain.

This course will give you a multi-disciplined picture of science in its historical context as it explores the ideas that took the world by storm.

Beyond that obvious benefit, it will also allow you to enjoy a provocative and nuanced look into an era of excitement and exploration, as scientific thought changed and adapted to accommodate a radically changing world.

This history of science series beginning in the 18th century works very well on its own, and is also designed to follow chronologically from Professor Lawrence M. Principe's 36-lecture course on the history of the foundations of science, **The History of Science: Antiquity to 1700.**

Course Lecture Titles

Part 1

1. Science in the 18th and 19th Centuries
2. Consolidating Newton's Achievement
3. Theories of the Earth
4. Grappling with Rock Formations
5. Alchemy under Pressure
6. Lavoisier and the New French Chemistry
7. The Classification of Living Things
8. How the Embryo Develops
9. Medical Healers and Their Roles
10. Mesmerism, Science, and the French Revolution
11. Explaining Electricity
12. The Amazing Achievements of Galvani and Volta

Part 2

13. Biology is Born
14. Alternative Visions of Natural Science
15. A World of Prehistoric Beasts
16. Evolution French Style
17. The Catastrophist Synthesis
18. Exploring the World
19. A Victorian Sensation
20. The Making of *The Origin of Species*
21. Troubles with Darwin's Theory
22. Science, Life, and Disease
23. Human Society and the Struggle for Existence
24. Whither God?

Part 3

25. Forces, Forces Everywhere
26. Electromagnetism Changes Everything
27. French Insights About Heat
28. New Institutions of Natural Science
29. The Conservation of What?
30. Culture Wars and Thermodynamics
31. Scientific Materialism at Mid-Century
32. The Mechanics of Molecules
33. Astronomical Achievement
34. The Extra-Terrestrial Life Fiasco
35. Catching Up With Light
36. The End of Science?