Lecture 9: Chemistry and Industry

1. Background
    Priestley, Lavoisier, and the nature of matter

2. Atomic Theory
    Dalton: gases, partial pressures, constant proportions
    Davy: electrochemistry, decomposition, new elements
    Berzelius: chemical notation and combustion analysis
    Kekulé: isomers, valency, and structure of benzene
    Mendeleev: periodic table

3. Applied Chemistry: Liebig
    Agricultural Chemistry, 1840
    Synthetic Fertilizers
    Nutrition and Beef Extract
    Sewage, Fertilizers, and Sewers

4. Synthetic Dyes and Industrial Chemistry
    Natural dyes
    Hofmann: coal tar derivatives
    Perkin: aniline purple
    Aniline red and blue
    Alizarin and the German chemical industry
    Indigo

5. Dyes and Pharmaceuticals
    Liebig and Merck
    Geigy, CIBA, and Bayer
    Aspirin and Heroin
    Paul Ehrlich, "magic bullets," and antibiotics

Further Reading:
    William H. Brock, *Justus von Liebig: The Chemical Gatekeeper*, 1997.
    Anthony S. Travis, *The Rainbow Makers: The Origins of the Synthetic Dyestuffs Industry in Western Europe*, 1993.

Names and Dates:
    Joseph Priestley (1733-1804)
    Antoine-Laurent Lavoisier (1743-1794)
    Henry Cavendish (1731-1810)
    John Dalton (1766-1844)
    Jons Jacob Berzelius (1779-1848)
    Humphrey Davy (1778-1829)
    Justis von Liebig (1803-1873)

Agricultural Chemistry (1840)
Animal Chemistry (1842)
August Kekule (1829-1896), benzene ring
Dmitry Mendeleev (1834-1907), periodic table
August Wilhelm von Hofmann (1818-1892), aniline dyes
William Perkin (1838-1907), mauve (1856)
Heinrich Emanuel Merck (1794-1855)
Merck, commercial production of alkaloids (1827)
Friedrich Bayer (1825-1880)
Bayer AG (1863), Heroin (1897), Aspirin (1899)