**Benjamin Franklin**

A worthy gentleman...informed me, that in a certain small cove of a mill-pond...he was surprised to see the surface of the water blaze like inflammable spirits...

I made the experiment with the same success. The bottom of the creek was muddy, and when stirred up, so as to cause a considerable curl on the surface, and a lighted candle held within two or three inches of it, the whole surface was in a blaze, as instantly as the vapour of warm inflammable spirits, and continued, when strongly agitated, for the space of several seconds...

He tried to repeat this in...stagnant water at the bottom of a deep ditch. Being some time employed in stirring this water, I absolved an intermittent fever, which a few days after, in my breathing too much of that foul air, which I stirred up from the bottom, and which I could not avoid while I stopped, endeavouring to kindle it....

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**Ch. 14.8-9 Sewage Treatment and Water Purification in the US**

*Primary Clarifier*

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**Septic Tanks in the US**

- Common in rural and suburban areas (25% homes)
- Most urban areas have sewage plants, and some cities separate storm and sewage water.
- Ecological purification uses natural systems or wetlands.

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**The Legal Approach**

Developing nations discharge most untreated sewage, while developed countries treat most sewage.

US

- Discharge Trading Policy (1995) to reduce water pollution using market forces.
- Opposition to Clean Water Act as too costly and restrictive to property owners.

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**Sewage Treatment Plants**

1. Primary Treatment: physical separation
2. Secondary Treatment: biological decomposition
3. Tertiary Treatment: chemical treatment, disinfections

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**Wastewater Garden**

Artificial wetland system developed for developing countries.
Sludge
- 9% converted to compost
- 36% to farmland, forests, golf courses, cemeteries, highway medians, degraded land
- 55% dumped to landfills (groundwater pollution) or incinerated (air pollution and toxic ash to landfills)

Tertiary Treatment

Water Supply in the US

Fox Metro Reclamation Plant Tour
http://www.foxmetro.dst.il.us/ptour1.htm

U.S. Safe Drinking Water Act
Environmentalists want improvement by:
1. Combining small with large water distribution systems.
2. Strengthening and enforcing notification about drinking water standards violations
3. Ban lead from plumbing fixtures
Polluting industries are pressuring Congress to:
1. Eliminate all national drinking water tests
2. Suspend requirement to notify media of emergency water health violations
3. Allow states to give industry exemptions to complying with standards where difficult
4. Free industry from removing cancer-causing contaminants

Drinking Water Purification in the US
An estimated 1-7 million people in the US are sick and 900-1200 die from contaminated water annually. An estimated 1/3 of bottled water is contaminated with bacteria!

Water Resources of the US: http://water.usgs.gov/
Surface Water: Settle in storage tank, filtered, disinfected
Ground Water: Public well water (groundwater) is treated to meet standards of the Safe Drinking Act (1974). Private wells are exempt.
How to Reduce Water Pollution

1. 
2. 
3. 
4. 

Business Ethics: “When in doubt, sleep on the floor and drink water”

Water: It is not until the well runs dry that we know the worth of water

Benjamin Franklin

Is Bottled Water the Answer?

- Bottled water is regulated by the FDA
- Members of the International Bottled Water Association (IBWA), who produce about 85% of the bottled water sold in the United States, must meet strict association standards (test for 200 contaminants)
- IBWA members use source protection and monitoring, reverse osmosis, distillation, filtration, ozonation or disinfections.
- Bottled water has never reportedly caused water-borne disease (US Centers for Disease Control and Prevention (CDC))