



## Greatest Engineering Achievements of the 20th Century

How many of the 20th century's greatest engineering achievements will you use today? Two of the top ten accomplishments fall within the scope of plumbing, heating and air conditioning. Following electricity, the automobile and the airplane, number four on the list is water supply and distribution systems.

At the outset of the century, waterborne diseases like typhoid fever and cholera were scourges across America. Typhoid alone killed more than 150 per 100,000 people annually (Wilbur Wright was one). Dysentery and diarrhea - the most common waterborne diseases - were the third largest cause of death in the nation. Given the conditions of streets and waterways, it is not hard to understand how these diseases spread so widely.

In 1900, it was common practice to dispose of garbage and raw sewage by dumping it into streets, alleys and waterways. Industrial waste was also dumped into the nation's waterways. Few municipalities treated wastewater, because it was widely believed that running water purified itself. Cisterns, which held a family's water supply, were breeding grounds for the mosquitoes that carried yellow fever. Indoor plumbing was rare. In rural areas, outhouses were commonplace, along with shallow wells. Pumping water for cooking was an early morning chore for most families. In urban areas, an average tenement housed two thousand people, but not one bathtub. To promote cleanliness, most large cities built public baths - the only place people could wash their entire body.

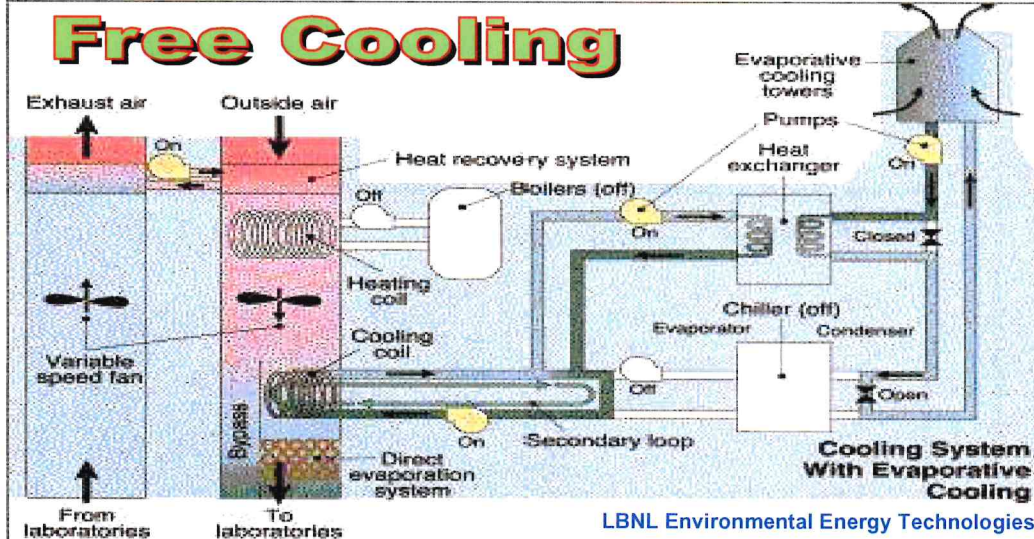
At the beginning of the 20th century, the main goal was to eliminate deadly waterborne diseases by purifying drinking water. A second goal was to build distribution systems that would bring clean water to rural areas as well as urban. A century of engineering dramatically and significantly reduced death rates from waterborne diseases. In addition, engineers developed innovative water supply and distribution systems that now bring water to areas where it is most needed - whether arid, rural, or urban. All of these efforts have led to an increase in life expectancy, a reduction in infant mortality and morbidity, and improvements in the environmental quality of life around the world.

The number ten innovation is refrigeration and air conditioning. Life changed immensely in the 20th century as air conditioning and refrigeration systems became more efficient, controllable, and even mobile. No longer dependent on the weather for work or play, humans truly made the environment adapt to their needs. Climate control became so reliable and affordable it grew from an invisible luxury to a common necessity. By the end of the century, nearly 70 percent of U.S. households had air conditioning. Now people can live and work in glassed-in or windowless buildings, in porchless houses, or in the warmest and most humid places. In the United States alone, air conditioning reversed a century-long pattern of migration out of the southern cities.

Refrigeration makes transporting fresh food and other perishables possible and makes home storage for days or weeks practical. By the end of the 20th century, 99.5 percent of U.S. households had a least one refrigerator. Many had separate freezers. People were able to simplify shopping and save money while enjoying a greater diversity and higher quality of food because of this excellent preservation technology.



National Academy of Engineering



During cool weather, the outside ambient temperature can help save energy in chilled-water systems. The low temperature of the cooling tower water supply enables free cooling of research laboratories, computer rooms, and office buildings. This free cooling is possible if the central plant incorporates a plate-and-frame heat exchanger to provide chilled water production, which means the chiller's compressor can be shut down. Free cooling can be used to save energy whenever the outside wet-bulb temperature drops below the required chilled water set-point. This energy-efficiency measure can save enough compressor electric power to pay for plate-and-frame heat exchanger installation costs in less than two years.

The plate-and-frame free-cooling system is operated whenever the chilled-water return temperature is greater than the cooling tower's supply water temperature. This operating strategy maximizes indirect evaporative cooling opportunities and can reduce chiller operation by one-third to one-half. If you would like more information on free cooling systems, just give us a call.

## What's Goin' On?

- Sep 25, 2003 **Ninth Annual Construction Institute Golf Classic**  
The Construction Institute
- Oct 19<sup>th</sup>-Oct 21<sup>st</sup> **Facilities America 2003 Conference, Dallas TX**  
Association for Facilities Engineering
- Oct 21<sup>st</sup> - Oct 24<sup>th</sup> **2003 NEHS Fall Conference Newport RI**  
New England Healthcare Engineers
- Oct 31<sup>st</sup> - Nov 2<sup>nd</sup> **ASPE 2003 Technical Symposium, San Antonio TX**  
American Society of Plumbing Engineers
- Dec 7<sup>th</sup> - Dec 10<sup>th</sup> **2003 HARDI Annual Conference, San Francisco CA**  
Heating, AC & Refrigeration Distributors International
- Jan 26<sup>th</sup> - Jan 28<sup>th</sup> **2004 AHR International Show, Anaheim CA**  
International AC, Heating and Refrigeration Exposition

## GOOFY LAWS STILL ON THE BOOKS



- In Kentucky it is illegal to carry ice cream in your back pocket.
- In Massachusetts you can't legally use tomatoes in clam chowder.
- If you live in Kentucky, you must take a bath at least once per year. It's the law.
- There is a law against shooting rabbits from a New York City trolley car.
- In Memphis, Tennessee, a woman cannot legally drive unless there is a man running on foot ahead of her car with a red flag to warn motorists that a woman is driving.
- It is illegal in Arizona to hunt camels.
- In Fairbanks Alaska, it is illegal to feed alcoholic beverages to a moose.
- In Pasadena, it is illegal for a secretary to be alone in a room with her boss.
- In San Francisco CA, it is illegal to wipe one's car with used underwear.
- In Salem MA, even married couples are forbidden from sleeping in the nude in rented rooms.

## You could WIN! DINNER for TWO

Name an eight letter word that has kst in the middle, in the beginning, and at the end.

Give us the correct answer and **WIN Dinner for Two**. If more than one correct entry is received, a winner will be selected at random. The answer to the "Riddle" from last time was "NOTHING" We received a record breaking 26 correct responses.



- Emily Belardinelli - Bethel Schools
- Bill Sapienza Family - Sapienza & Lessig
- Kay Balun - MannKind BioPharmaceuticals
- Claudia Rosas - MannKind BioPharmaceuticals
- Holly & Graham Gurry - A.H. Harris Company
- Daniel J. Kearns - Kendro Laboratory Products
- Joe Furman - RCMS Controls
- Kurt Kuegler - Kuegler Associates
- Patrick Tallarita - State of CT, Dept. of Labor
- Joscelyn Beaudin - Coldwell Banker
- Bob Balkun - Belimo Aircontrols (USA), Inc.
- Salley Profeta - H & R Design Inc.
- Al DiVincentis - Garcia & Milas, P.C.
- Andy McBeth - J.M. Coull, Inc.
- Gary Lane - ASML
- Oscar Oltavaro - Spartech Polycast
- John Ziobro - Spartech Polycast
- Mary Ellen Dunbar - Vanguard Products Corp.
- Diane Baker - Hines
- Bel Forte - Charles Beckman Swanson Architects
- Al Wasko - Hospital of Saint Raphael
- Carol Cosker - Local 777 Plumbers & Pipefitters
- Susan Stout - Local 777 Plumbers & Pipefitters
- Mary Tanguay - Local 777 Plumbers & Pipefitters
- Cassie Plummer - Caldwell & Walsh
- Renee Bergen - City of Danbury

A final winner will be selected at random.

[www.MulvaneyMechanical.com](http://www.MulvaneyMechanical.com)

