


**Chapter Sixteen:
 Promoting
 Environmental Health**

**13th edition
 pages 492-506**

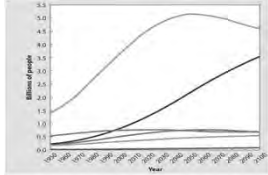
**12th edition
 pages 456-475
 Chapter 15**



overpopulation

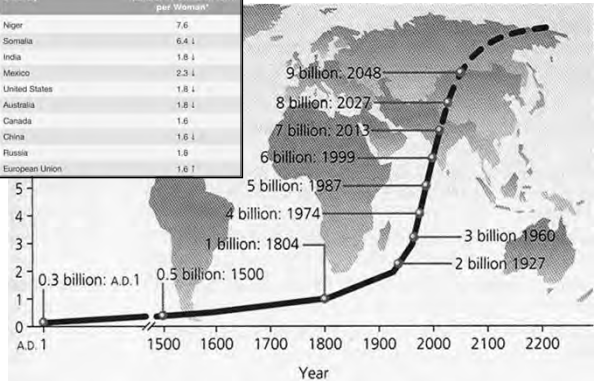
13th pp. 493-495; 12th pp. 456-60

- since 1950, the world's population had doubled, increasing world requirements for energy and resources:
- 1959:** 2 billion
1974: 4 billion
31 Oct, 2011: 7 Billion
by 2025: 9.8 billion?
- 3 most populated countries are:
 China: 1.4 bil, India: 1.3 bil, US: 326 mil
 Fertility rates:
 <Nigeria: 7.6 per 1000, >Japan: 1.2
 United States is 1.80 per 1000
- unequal growth, most in the developing countries urban areas: 'megatropolises': Jakarta, Cairo, Mumbai, Calcutta, Mexico City which are becoming unwieldy ecological disasters
- 97% of population growth will take place in less developed nations
- growth strips away any economic growth (GNP)
- We are currently using 1.6 of our planet's resources...1.0 is sustainable.



are we running out of room and resources?
not in books

Country	Number of Children Born per Woman
Niger	7.6
Somalia	6.4
India	2.3
Mexico	2.3
United States	1.8
Australia	1.8
Canada	1.6
China	1.6
Russia	1.8
European Union	1.6




overpopulation, con't


13th pp. 493-495; 12th pp. 456-60

Measuring the impact of overpopulation:

- 60% of the world's wildlife population as become extinct in the past 40 years
- total collapse of all fish species by 2050 due to pollution and over fishing.
- bio diversity: 32% of plant species will become extinct with-in the next 25 yrs.
- as food sources are endangered and famines increase, there is a push to us to eat less high resource produced food such as beef.
- drinking water contamination remains the greatest single source of human sickness and death. Drinking water sources are shrinking with increased land erosion, deforestation, climate change less the availability.



our world is a finite environment




*unbalanced energy consumption...
 and inevitable shifts in fossil fuel prices*

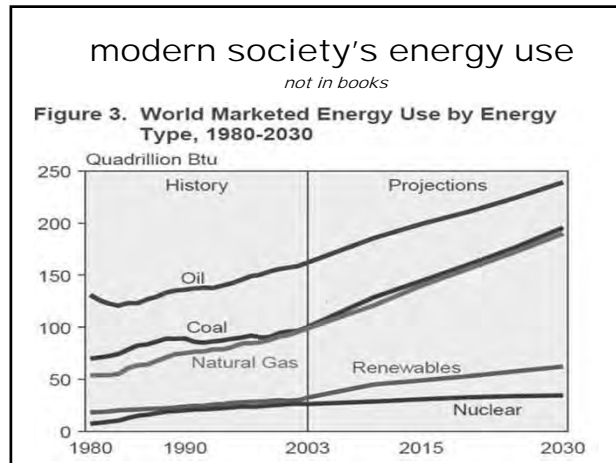
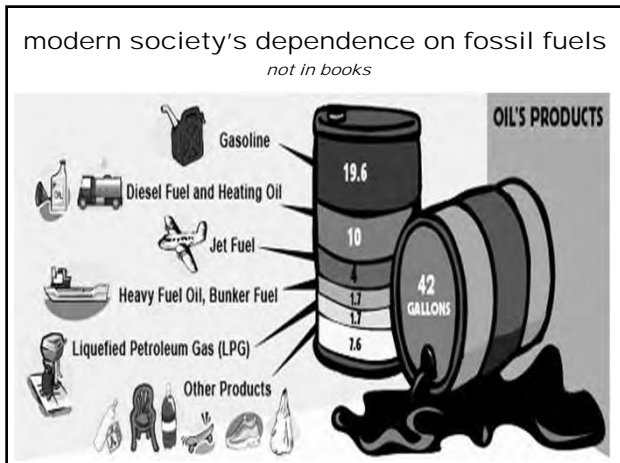
13th pp. 494-495; (not in 12th)

Oil Consumption in Selected Countries (millions of barrels per day)

	1995	2004
United States	17,700	20,700
China	3,360	6,500
Japan	5,680	5,400
Germany	2,880	2,600
Russia	2,980	2,600
India	1,570	2,300
Brazil	1,790	2,200
Canada	1,820	2,300
France	1,920	2,000
Mexico	1,820	2,000



**5% of the world population consumes nearly 25% of the produced energy
 In August of 2010 China became the leading global energy consumer**



outdoor air pollution
 13th pp. 495-496; 12th pp. 459-61

Smog a killer: Study links deaths, ozone
 Valley air worst in nation by daylong measurement

BY MARY BRIDGES
 THE IRVING DILL

Scientists are reporting the strongest link to date between smog and higher death rates in cities across the United States, including Stockton, Modesto, Fresno and Bakersfield.

Small, temporary increases in summertime smog correspond with the premature deaths of almost 2,000 people per year in 10 cities, according to a study published today in The Journal of the American Medical Association.

Using data from 1987-2000, the study showed the death rate increased slightly after temporary increases in summertime ozone among cities, even though the pollution levels did not violate the federal health standard.

The study and people with lung or heart problems faced the worst, but people of all ages were affected, say researchers from Yale and Johns Hopkins universities.

Though the study does not reach the severity of the problem for each area, the San Joaquin Valley leads the nation in smog.

SEE BACK PAGE, SMOG

Environmental pollution kills 9 million per year worldwide

sources of air pollution:

- sulfur dioxide
- particulate matter
- carbon monoxide
- ozone
- hydrocarbons
- methane

(from dairies and decomposing plant matter)

create photochemical smog, or the brown inversion layer often trapped in valleys due to atmospheric conditions which trap gasses from dispersing

the clean air act of 1970 began the process to clean emissions. California has the toughest standards in the US for emissions

developing countries such as India and China now often have for worst air quality.

New Delhi, India smog

the valley's challenge
not in books

BAD-AIR TRAP

Valley air quality suffers in the fall and winter months as part of an inversion layer traps cool air on the valley floor. Under normal conditions, air stirred by the sun rises from the ground. As the air rises, it cools, becomes denser and sinks back to the ground. An inversion layer is a layer of warm air above the ground that prevents the air from rising. Inversion layers usually occur just before dawn. After the ground cools, the air above it is warmer than the air near the ground. This warm air has a layer of warm air — such as on a large high-pressure system — parked over the valley.

Large high-pressure systems, parked over the continental United States.

Warmer air trapped layer

Coal air

San Joaquin Valley

Sierra Nevada

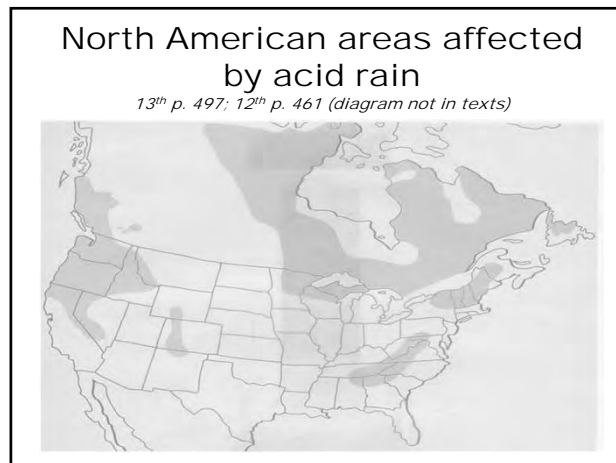
A MATTER OF BREATHING

Particulates are tiny matter suspended in the air including dust and soot from farming, roads and construction.

- Large particles — more than half a millimeter in size — are trapped in the mouth, nose and throat. They are caused by smearing or coughing. Particles include acid mist, coarse dust and microscopic bugs.
- Particles that penetrate the air passages measure five to 15 microns and lodge in the nose and throat. Symptoms include difficulty breathing, coughing and suppression of mucus from the lungs.
- Only the finest of particles — measuring 2.5 microns or less — make it through the body's filtering defenses to lodge in the lung's deepest recesses. Particles come mainly from combustion, including smelting, auto and indoor.

acid deposition or acid rain
 13th p. 497; 12th p. 461

- acid rain is water droplets falling through acidic particulates in the air in the form of rain, snow, fog
- Coal powered power plants, oil refineries, burn fossil fuels are the main sources
- when run off goes into streams, ponds, or lakes, it eventually acidifies the water, and eventually plant and animal life can no longer survive
- lime stone areas are particularly effected
- 75% of Europe's forest are effected, and over 50% of north America's forest are damaged.
- studies show acid rain can reduce crop yield by 23%.



indoor air pollution

13th p. 497; 12th pp. 461-62

- as our homes become better insulated, there is a growing concern regarding indoor pollutants
- our homes can be 10-40 more times hazardous than outdoor air. 20-100 potentially chemicals are found in the average American home.
- major contributors are:
 - woodstove smoke and furnace emissions
 - asbestos
 - formaldehyde
 - tobacco smoke
 - household chemicals
 - toxic molds (chart on page 497 in 13th, and 462 in 12th)

ways to improve our indoor environment:

- better ventilation- clean filters – remove the source – air cleaners

ways to reduce indoor pollutants

13th p. 497; 12th pp. 461-62

- Take up wall-to-wall carpeting, especially in bathrooms/ kitchens
- Say no to fido or kitty in the house
- Take off shoes
- Get hypo-allergenic pillows & replace regularly
- Take off work clothes when at home
- Shower before bed
- Remove all indoor plants, real or artificial
- Increase ratings of air system filters
- Utilize 'hepa' or ion filters in most used rooms
- Get a good quality vacuum cleaner
- Use local honey to reduce allergies
- Get rid of fish tanks with circulation systems in the house
- Check for any water seepage promoting mold



under sink mold

climate change

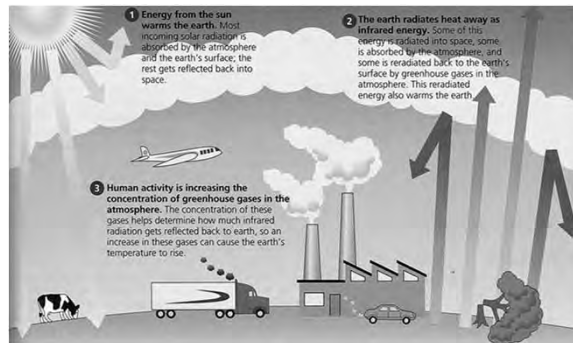
13th pp. 498-500; 12th pp. 463-64

- more than 100 yrs. ago scientists theorized the burning of fossil fuels would create a buildup of greenhouse gases
- the greenhouse effect is caused by predominantly carbon dioxide gases which are produced from burning fossil fuels. Rapid deforestation is also causing the build-up of carbon dioxide gases in addition to CFC's, ground level ozone, nitrous oxide
- these gases from a 'filter' around the planet allowing solar heat to penetrate the atmosphere, but traps the heat in, heating the earth surface, increasing an average of 1.5°F in past century, increasing to 2° to 11.5° in the next 100 years.



enhanced greenhouse effect

13th pp. 498-500; 12th pp. 463-64 – diagram not in book



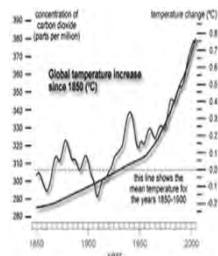
climate change, con't

13th pp. 498-500; 12th pp. 463-64

- the average world temperature is the highest it has been since first recorded, with carbon dioxide at all-time highs due to the use of fossil fuels
- effects of global warming are: rising seas levels - several cities and nations could disappear
- more dramatic weather phenomenon's: tornados, hurricanes, droughts, floods, heat waves, cold waves

Toward Sustainable Development:

- necessitate shifting from fossil fuels to alternative energy sources, with improved efficiency, plus change in societal behaviors. Difficult to predict the future as increasingly major polluters are developing countries.



climate change, con't

not in books

Global warming sees violent, sicker, poorer future: The Nobel Peace Prize-winning Intergovernmental Panel on Climate Change issued a report March '17 on how climate change is already affecting the way people live and what will happen in the future, including a worldwide drop in income:

- People dying from warming and sea rise-related flooding, especially in big cities
- Famine because of temperature and rain changes, especially for poorer nations
- Farming changing because of lack of water
- Infrastructure failures because of extreme weather
- Dangerous and deadly heat waves worsening
- Certain land and marine ecosystems failing
- Summer '16 ratification of the Paris Climate Accord offers hope to reduce world carbon omissions...now the US is pulling out, asking China and the Euro. Union to take the lead.



climate change, *con't*

local realities (not in books)

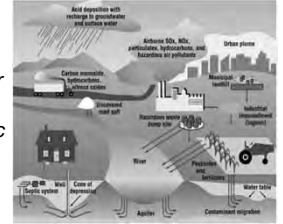
- Change in growing seasons will effect farming and yields
- Unpredictable snow-rain fall make farming more difficult
- Rise in sea levels and tide patterns make the Delta more saline, changing water patterns
- Global shifts in food availability will make food more expensive for those that can afford it, starving those who cannot
- Since 1985 we've experienced a 'new normal'. 2018 was the hottest year ever in the US.



water pollution

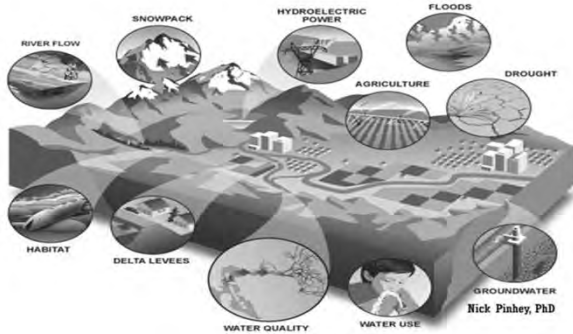
13th pp. 500-501; 12th pp. 465-66

- 75% of the earth is covered in water, and more is underneath it's surface, yet only 1% is drinkable!
- water pollution is particularly dangerous because it easily spreads while water is necessary for every living thing's survival
- two kinds of water pollution:
 - point source:** enters water through a specific contamination source: a septic tank, pipe, culvert
 - non-point source:** runoff or sedimentation. Responsible for over 90% of water pollution
 - pollutants originate from:** septic systems, petroleum products, pesticides, and other chemical products easily dispersed by water.



The valley water puzzle

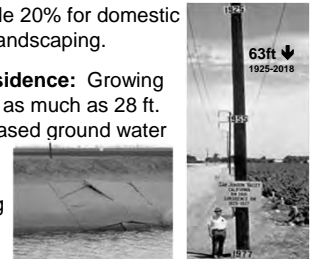
not in books



California's challenge

not in texts

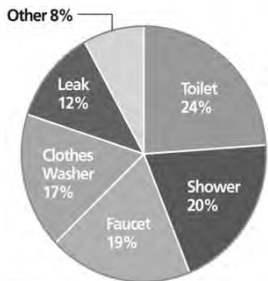
- While the state's population has doubled in the past 80 years, our water capture/management strategies have changed little.
- Percentages vary, but 80% of the state's water is used in agriculture/conservation, while 20% for domestic use a majority of that being landscaping.
- Central Valley ground subsidence:** Growing problem with areas dropping as much as 28 ft. in past 30 years due to increased ground water pumping for agriculture. Once compacted, aquifer cannot rebound creating long term implications.



conserving our most precious resource

13th pp. 500; 12th pp. 466

daily per capita water use in single family U.S. homes

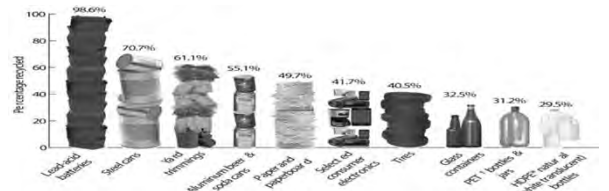


- Turn off tap while washing dishes
- Run dishwasher when full
- Wash full loads of laundry + adjust water level to suit load
- Replace toilets with high efficiency versions, or put a quart bottle in tank
- Limit shower times...showers use less water than baths
- Replace old shower heads with water efficient ones
- Turn off tap while brushing your teeth or men whilst shaving
- Always use an on/off nozzle on hoses and don't hose off concrete.

land pollution

13th pp. 501-503; 12th pp. 467-68

- each U.S. citizen generates 4.5 lbs. of solid waste each day
- 90% is recyclable
- yet 52.6% goes into landfills
- we currently recycle only 34.6%
- municipalities now have to reach government set quotas or risk losing federal matching funds



dispose of waste properly

not in books



ENVIRONMENTAL CRIME SCENE

The rubbish cannot be collected by the normal refuse collector's vehicle.
This rubbish will now stay here until it is collected on.

In future, to remove waste of this type or size please call (Shredline on 020 7361 3001). The Royal Borough and its partners work hard to keep your streets clean and tidy and we appreciate your help - Thank you.

Love the streets you live in

- Dumping of waste in Stanislaus county is a huge and growing concern
- Urban streets and alleys along with rural canals & roads
- Be considerate: Take rubbish to a transfer site

- Call your disposal company for potentially free collection
- Take all electronic and toxic waste to designated collection sites
- Dumping of any sort costs thousands of dollars and degrades our living environment where we all live!

‘Fracking’ boom or disaster?

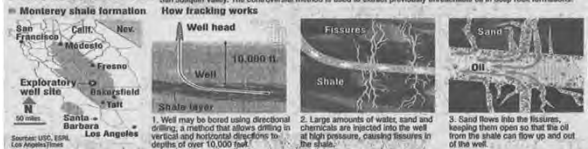
not in books

- Induced hydraulic fracturing: water, sand and solvents pumped under pressure into underground shale fissures to force out oil and natural gas.
- First use in 1947 in Texas, but modern methods since 1998 have made it much more effective and economical.
- Opponents warn of polluted underground water tables and possible earthquakes.
- Proponents say the US oil/gas reserves if fracked could make the US and oil exporter realizing millions in tax revenue and saving millions from importing from unstable middle eastern, African, or Latin American nations
- 5 minute video: <https://youtu.be/Ut2niW2BRA>

FRACKING FOR OIL

Oil companies want to use hydraulic fracturing, also called “fracking,” to extract oil from the Monterey shale under the San Joaquin Valley. The controversial method is used to extract previously unreachable oil in deep rock formations.

How fracking works



1. Well may be bored using directional drilling, a method that allows drilling to vertical and horizontal directions to depths of over 10,000 feet.

2. Large amounts of water, sand and chemicals are injected into the well at high pressure, creating fissures in the shale.

3. Sand flows into the fissures, keeping them open so that the oil from the shale can flow up and out of the well.

what we can do

13th, p. 506

- don't use plastic drinking bottles
- use your own shopping bags
- be conscious of using plastic
- sort your trash and recycle
- check labels for environmental safety
- buy products in recycle packaging
- buy liquids in refillable containers
- buy organic foods when feasible
- be smart with auto use, and maintain your vehicle
- avoid using products from environmentally less responsible companies.






what we can do, *con't*

13th, p. 506

- plant a tree. Even a single tree helps absorb carbon dioxide and over time can reduce the need for air conditioning
- hit the switch reducing energy needs. Keep the house warmer in the summer, cooler in the winter
- cancel junk mail by contacting the direct marketing association at: <https://www.dmchoice.org>, or 888-5-OPT-OUT
- be water wise by using water efficient facets and shower heads. Don't water gardens in the heat of the day, and sweep, don't hose off surfaces
- speak out: write your representative, vote responsibly.



“We are the first generation to know we are destroying our planet, and could be the last one that can do anything about it”

World Wildlife Director – Sept, 2018

- what I've learned this semester...***
- understand what it takes to be a full-time student
 - Better manage my time- go to class!
 - Better utilize available resources at MJC...ask questions and get help when needed
 - Check my student e-mail more frequently
 - Want to get training to be a college student? Enroll in a study skills/college success class
 - Above all...work to apply what you've learned during this class to live a more fulfilled life!