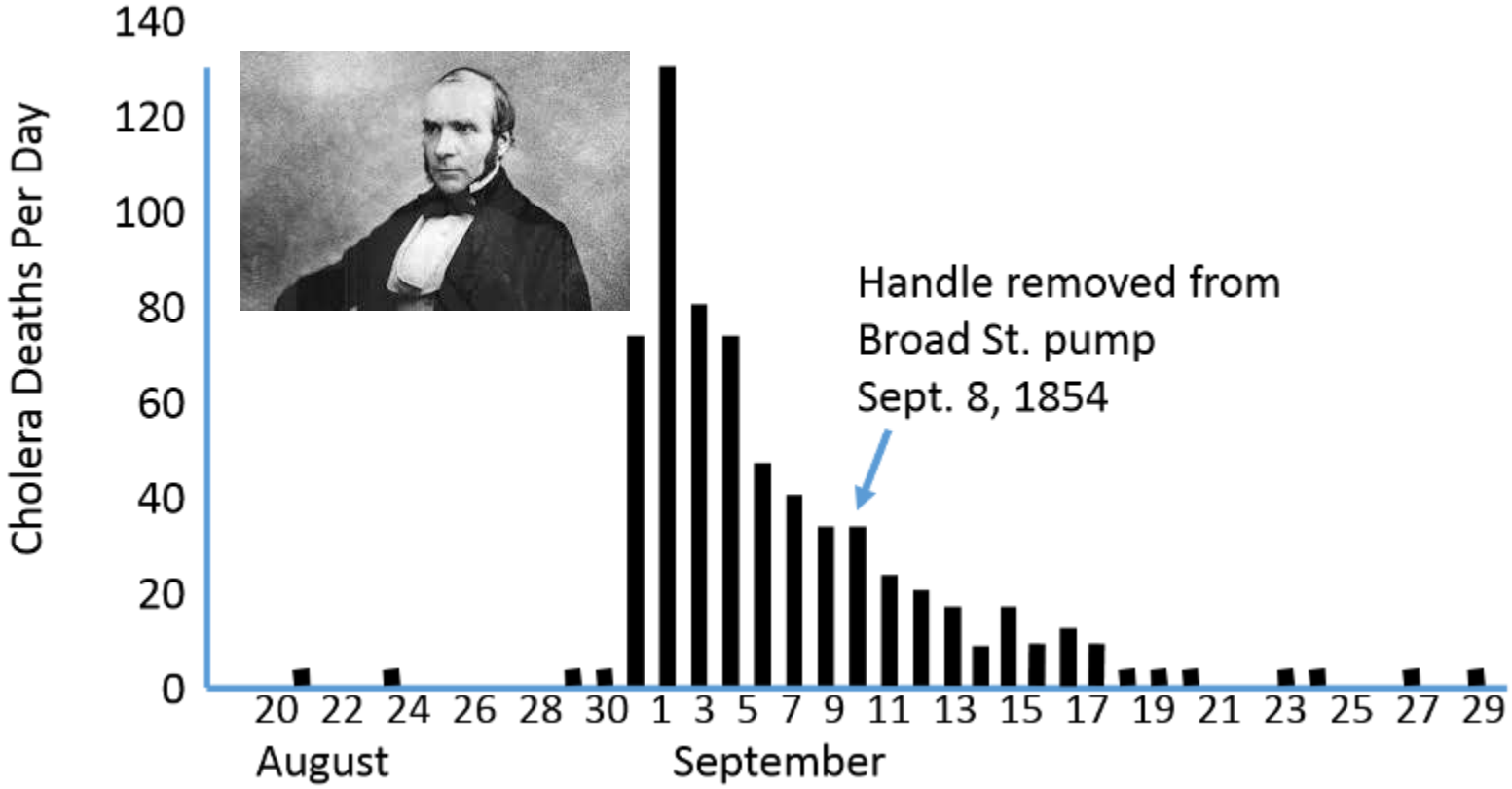
Public Health

GREAT MARLBOROUGH STREET
MARLBOROUGH MEWS
PUMP
WORK HOUSE
PORTLAND STREET
PORTLAND MEWS
BROAD STREET
PUMP
RICHMOND BUILDINGS
RICHMOND MEWS
BREWERY
EDWARD STREET
PETER STREET
LITTLE PULTENEY STREET
GREAT PULTENEY STREET
BRIDLE STREET
SILVER STREET
KING STREET
GOLDEN SQUARE
PUMP
ARCHER STREET
UP RUPERT ST
PUMP
PUMP



Cholera…

- Dr. John Snow had the “crazy idea” that cholera had something to do with water contaminated by sewage

- Idea was dismissed wildly, miasma or contaminated air was blamed

https://www.ph.ucla.edu/epi/snow/snowcricketarticle.html

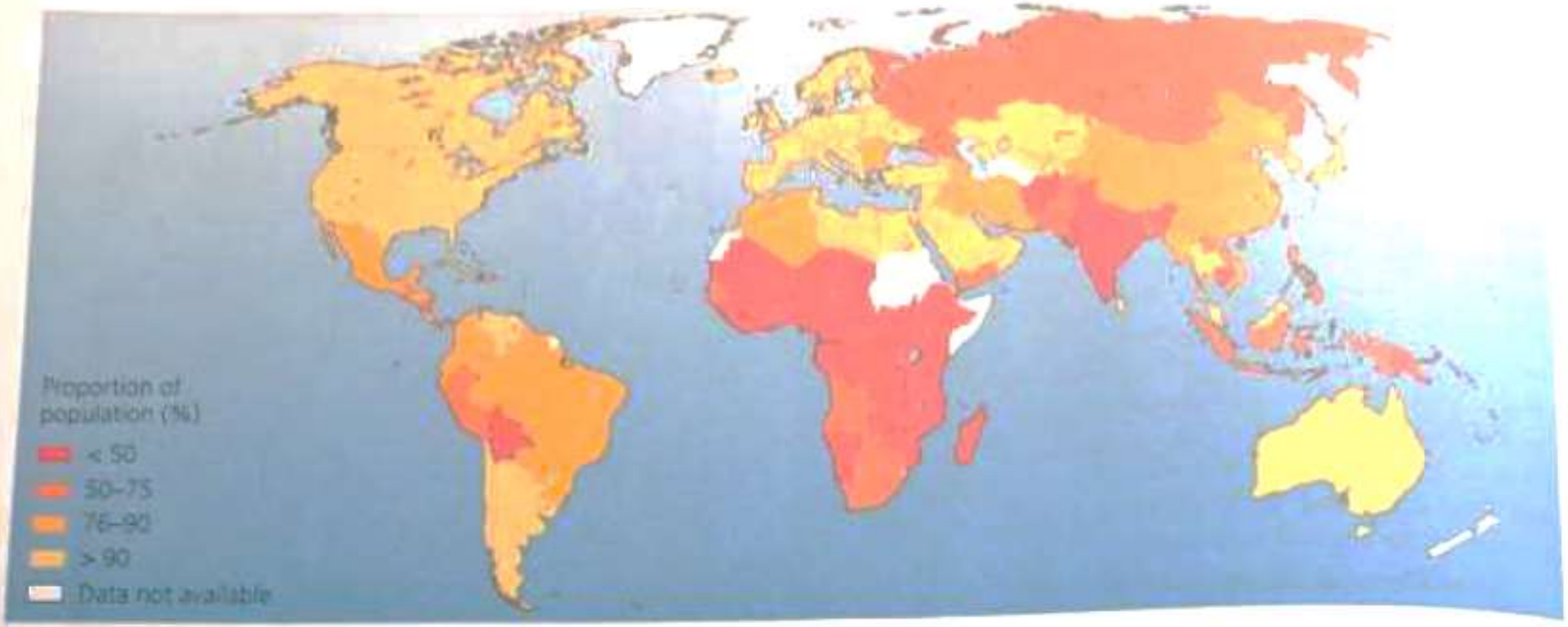


FIGURE 14.6 We are gradually improving access to improved sanitation for the world's people, but access in some regions remains inadequate. In much of central Africa, for example, less than half of the people have access to sanitary facilities that reduce the spread of disease. *Data from World Health Organization. 2015. Geneva, Switzerland: WHO. http://www.who.int.*

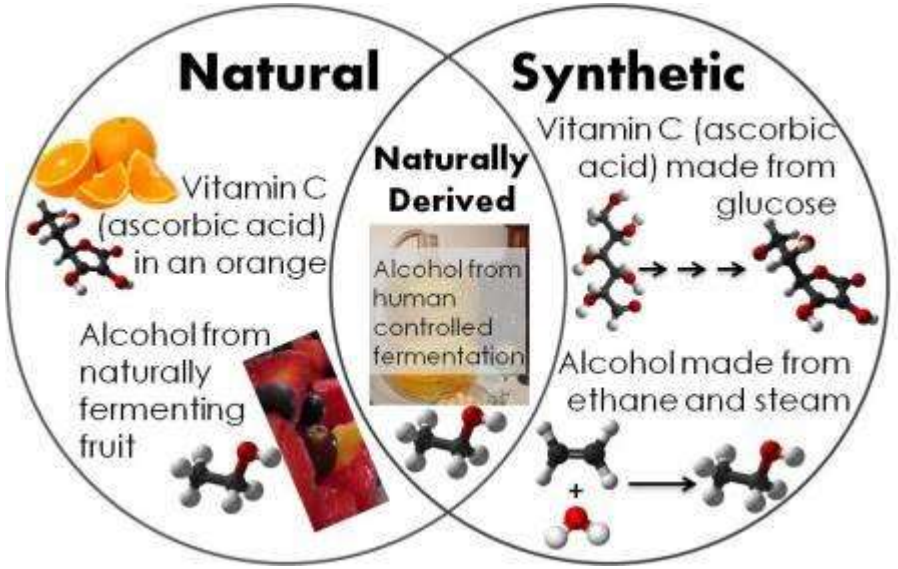
Toxicity

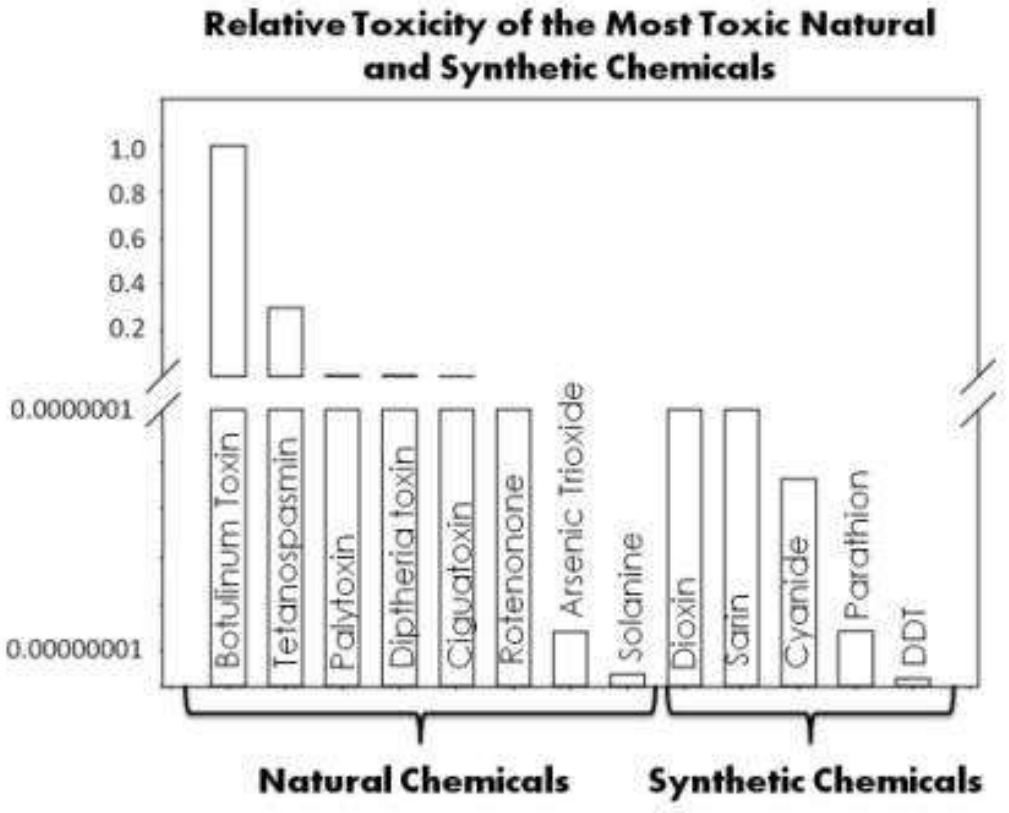
In genetics, a **mutagen** is a physical or chemical agent that changes the genetic material, usually DNA, of an organism and thus increases the frequency of mutations above the natural background level.

A **teratogen** is an agent that can disturb the development of the embryo or fetus. **Teratogens** halt the pregnancy or produce a congenital malformation (a birth defect). Classes of **teratogens** include radiation, maternal infections, chemicals, and drugs.

Synthetic vs. natural chemicals

Misconception: Synthetic chemicals are more toxic than natural chemicals.
The two most toxic chemicals for humans, that we know of, are botulinum toxin and tetanospasmin. Botulism is caused by botulinum toxin, which is a protein and neurotoxin produced by bacteria spores. Tetanospasmin is a neurotoxin produced by bacteria that causes Tetanus. I created a bar graph to help us visualize the relative toxicities of the most toxic natural and synthetic chemicals to humans:





Phthalates are a group of chemicals found in many of these plastic products. They are additives known as plasticizers which are plastic additives that add flexibility and other desirable characteristics to industrial and consumer products. They also help plastic products retain their colors and scents.

Cosmetics

Shampoo, lotion, nail polish and other personal care products

Toys

Baby products including lotion, shampoo, powders and teethers

Medical equipment including tubing, blood bags, and plastics in the NICU

Building materials including vinyl flooring, wall paper, paint, glue and adhesives

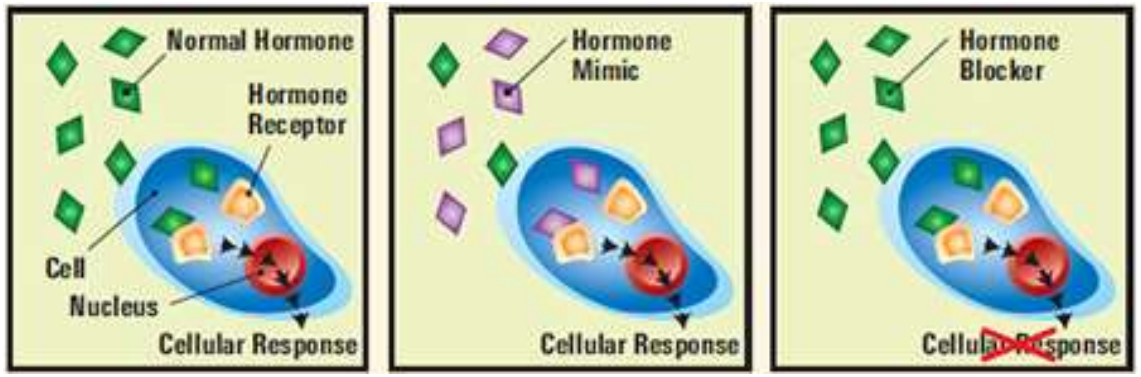
Automobiles (phthalates are responsible for the 'new car' smell);

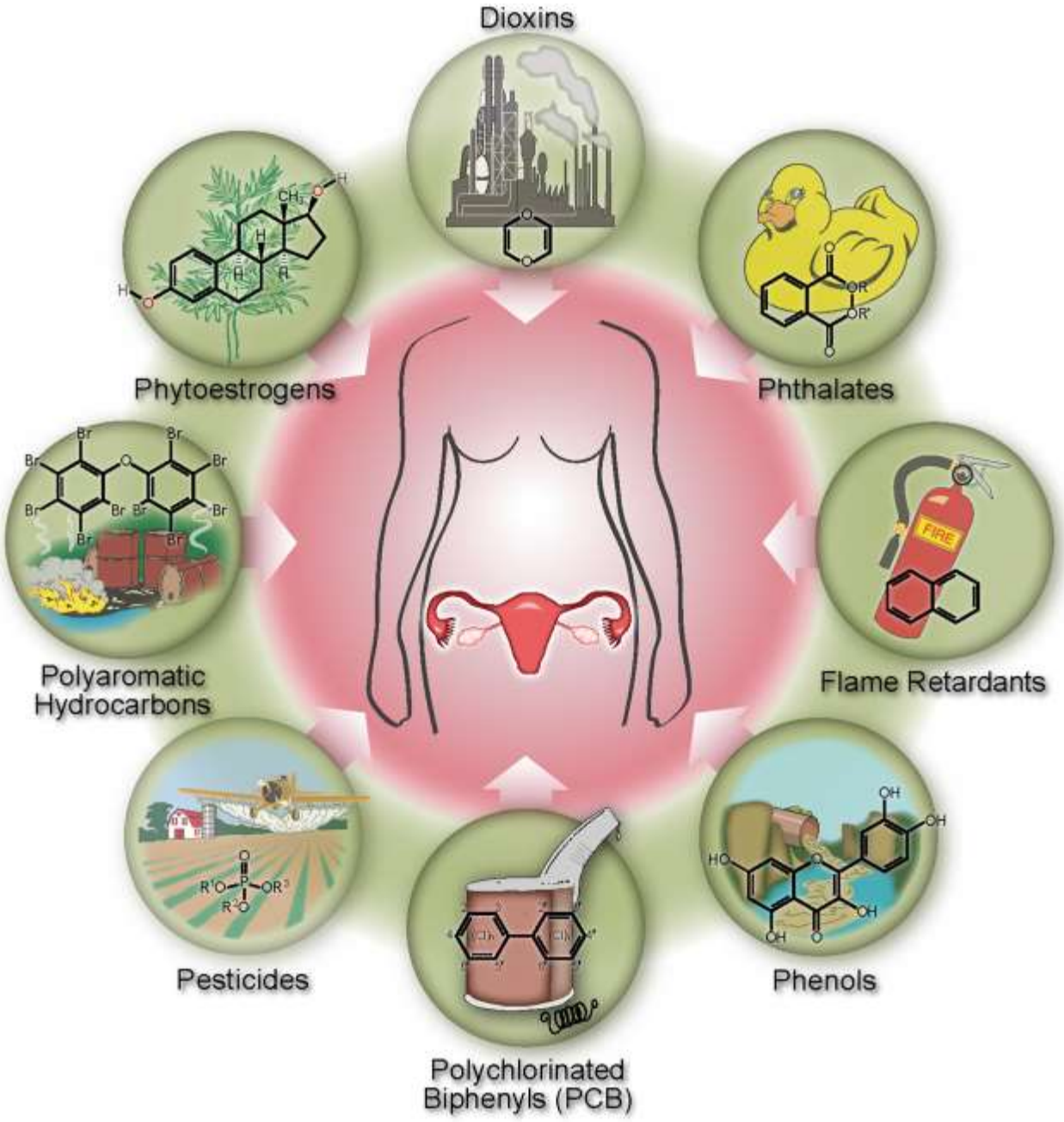
Enteric coatings of pharmaceuticals

Art supplies including paint, clay, wax and ink

Scented products such as candles, detergent and air fresheners

Endocrine disruptors are chemicals that can interfere with **endocrine** (or hormone) systems at certain doses. These disruptions can cause cancerous tumors, birth defects, and other developmental disorders. Any system in the body controlled by hormones can be derailed by hormone **disruptors**.





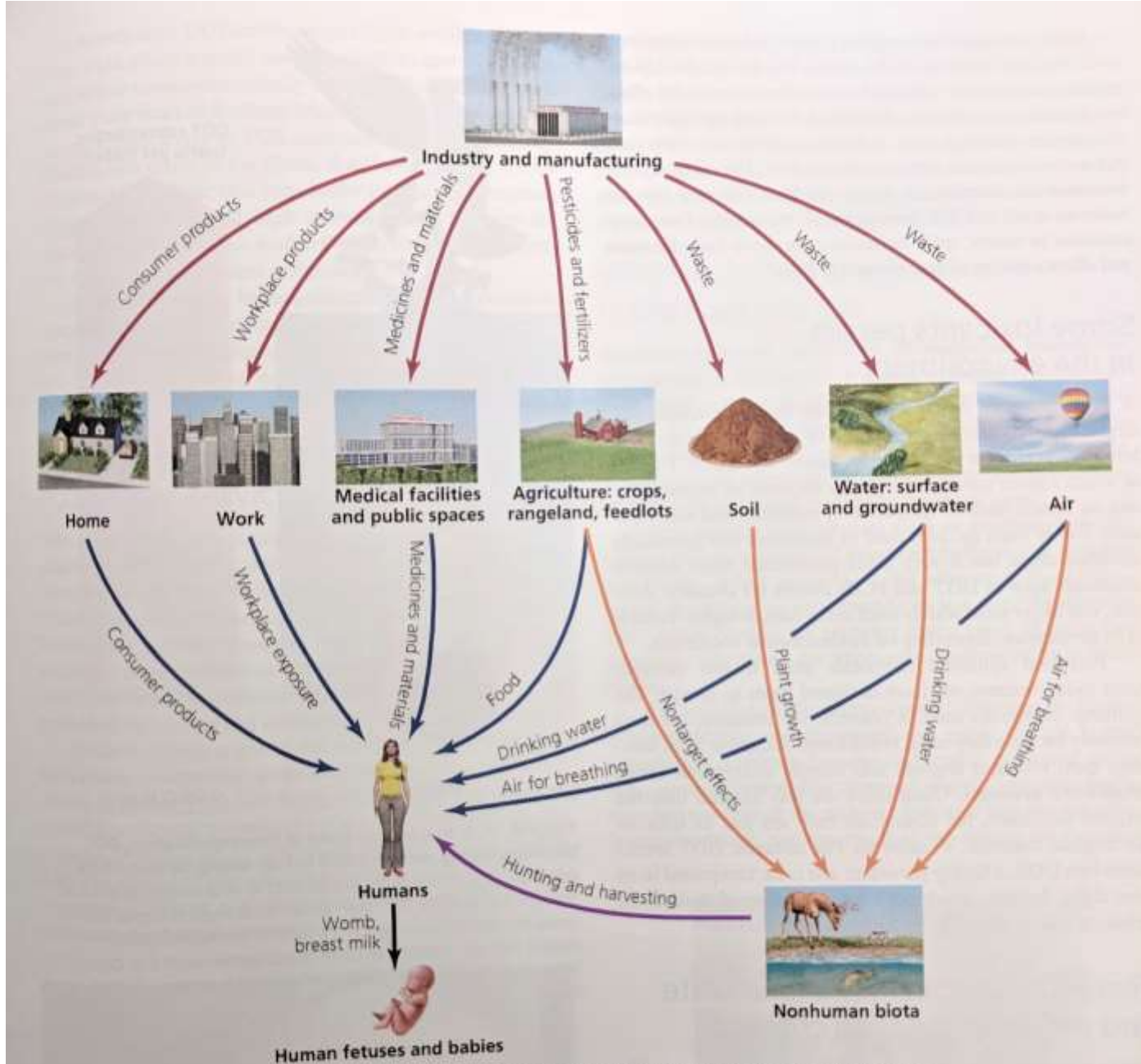


FIGURE 14.13 Synthetic chemicals take many routes in traveling through the environment. People take in only a tiny proportion of these compounds, and many compounds are harmless. However, people receive small amounts of toxicants from many sources, and developing fetuses and babies are particularly sensitive.

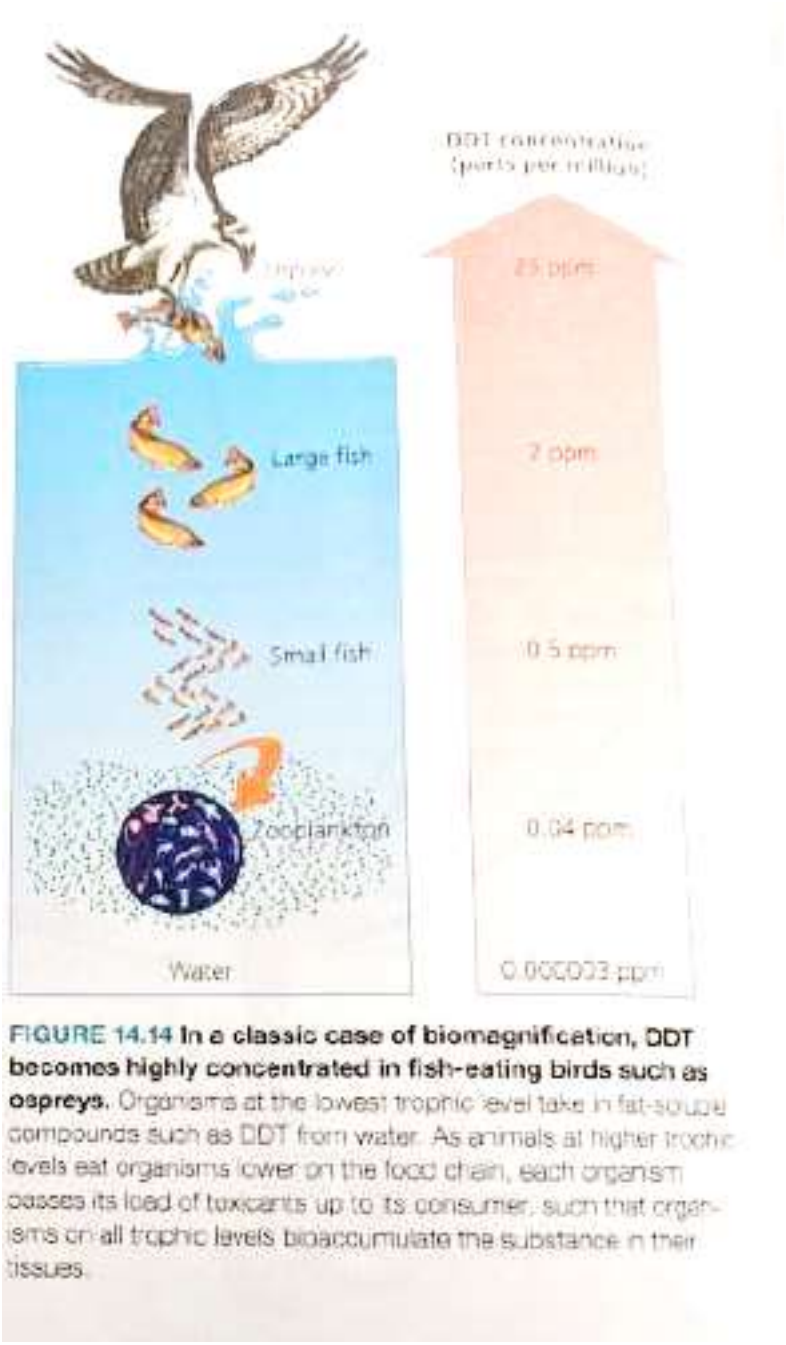
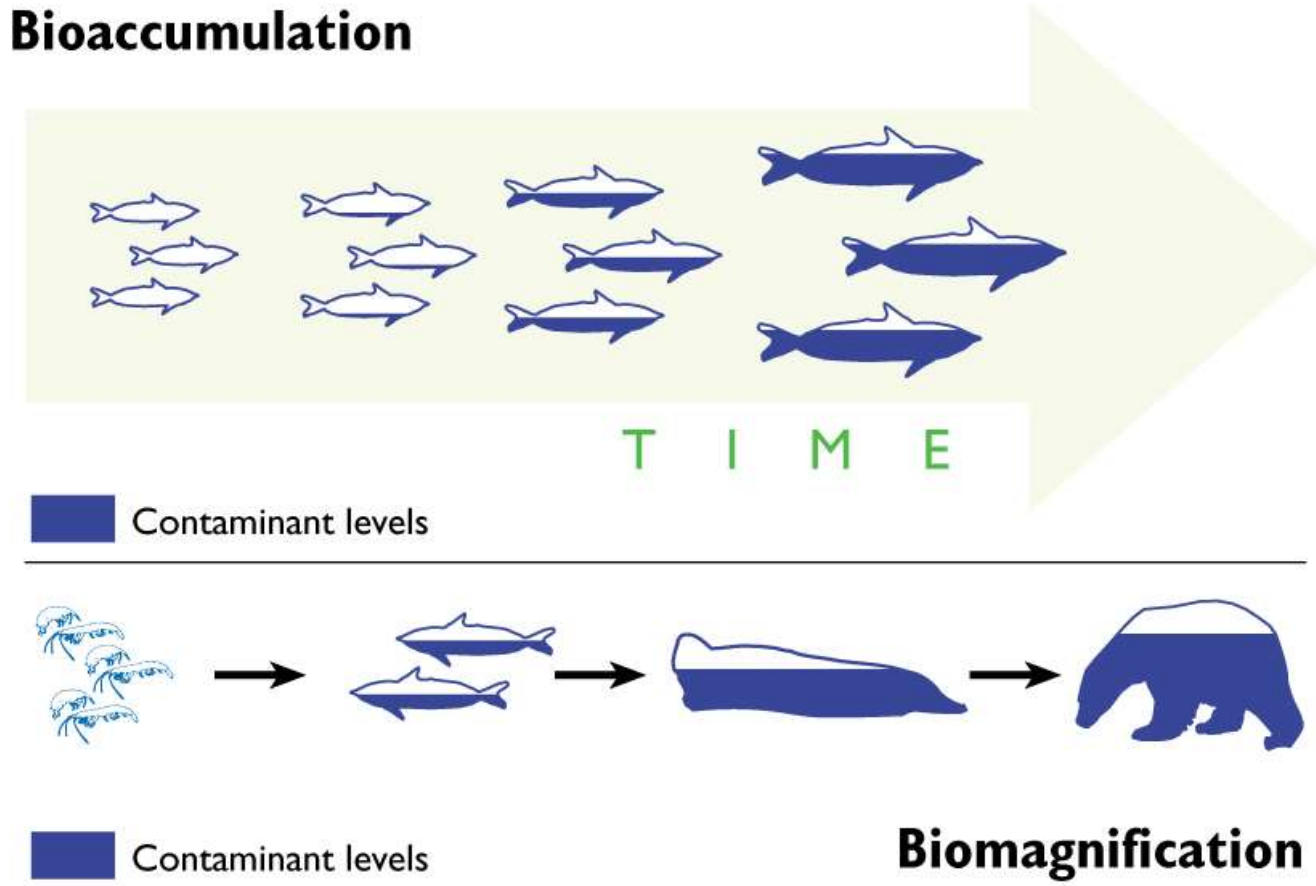


FIGURE 14.14 In a classic case of biomagnification, DDT becomes highly concentrated in fish-eating birds such as ospreys. Organisms at the lowest trophic level take in fat-soluble compounds such as DDT from water. As animals at higher trophic levels eat organisms lower on the food chain, each organism passes its load of toxicants up to its consumer, such that organisms on all trophic levels bioaccumulate the substance in their tissues.

Bioaccumulation is the accumulation of substances, such as pesticides, or other chemicals in an organism. Bioaccumulation occurs when an organism absorbs a substance at a rate faster than that at which the substance is lost by catabolism and excretion.

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