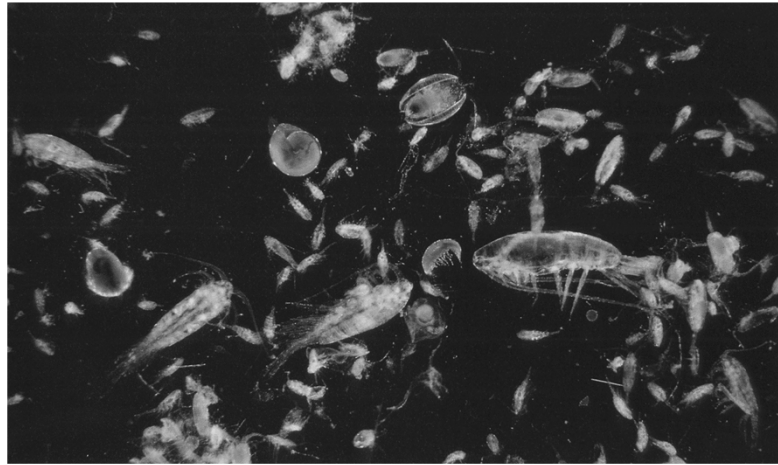


BIO ACCUMULATION



WHAT ARE THESE LITTLE GUYS EATING? AND WHY DOES IT AFFECT US?

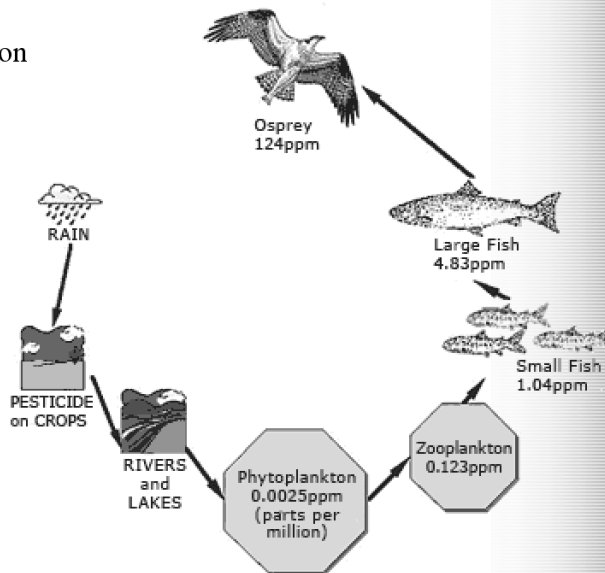
Unless we get eaten by a bear or shark, most of us are going to stay at the top of the food chain. This means that we eat other creatures, like fish and birds, but they don't eat us. This isn't such a bad place to be - if you're going to be in a food chain, you definitely want to be at the top! But there are some unique hazards associated with being at the top of the food chain, and one of these hazards is bio-accumulation.

Bio-accumulation occurs when substances become more concentrated as they go up the food chain. Toxic substances like methyl mercury, and pesticides like DDT, build up higher and higher concentrations in each level of the food chain. Many industrial processes release inorganic mercury into the air. After it rains down to earth, this mercury usually undergoes a chemical transformation (known as methylation) where it is converted into the extremely toxic methyl mercury.

Imagine that the water in your local river has a high concentration of methyl mercury (in fact, many rivers in Alberta do have high levels of methyl mercury). Assume that the level is 0.01 parts per million (ppm). This methyl mercury is absorbed by microscopic water plants called phytoplankton. Microscopic animals, called zooplankton, eat the phytoplankton. The methyl mercury that the phytoplankton carried is now part of the zooplankton. The zooplankton are in turn eaten by small insects, and the insects are eaten by minnows. The minnows acquire all the methyl mercury that was

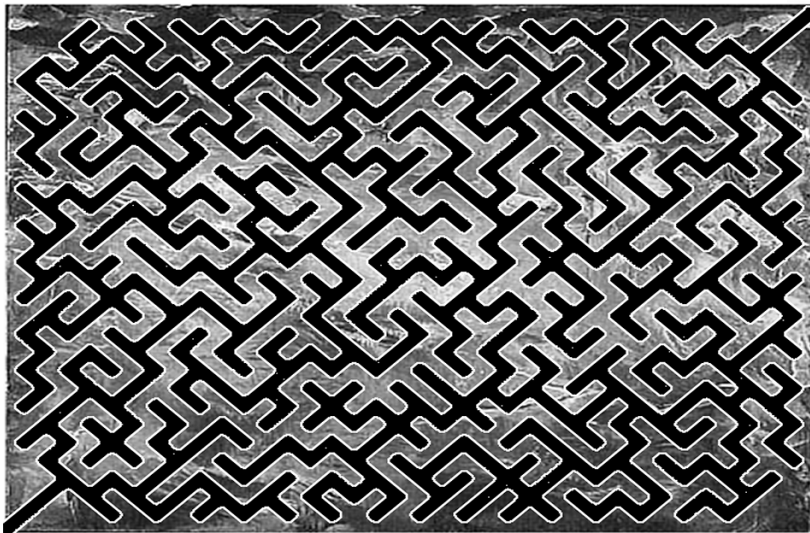


in the insects and the zooplankton and the phytoplankton. These minnows may have a methyl mercury concentration of 0.1 ppm in their body tissues (ten times higher than the level found in the waters in which they swim).



The minnows get eaten by perch, and the perch may have a methyl mercury concentration of 0.4 ppm. The perch are eaten by pike, and the pike may have a concentration of 0.8 ppm. If a bird of prey were to eat a lot of pike, it would probably have an even higher concentration of mercury in its body tissues. The same thing goes for human beings. If we were to regularly eat fish with high methyl mercury concentrations, we would probably see a rise in the mercury levels in our own systems. This methyl mercury binds strongly with the proteins in our bodies, so it is easily accumulated and retained in our body tissues.

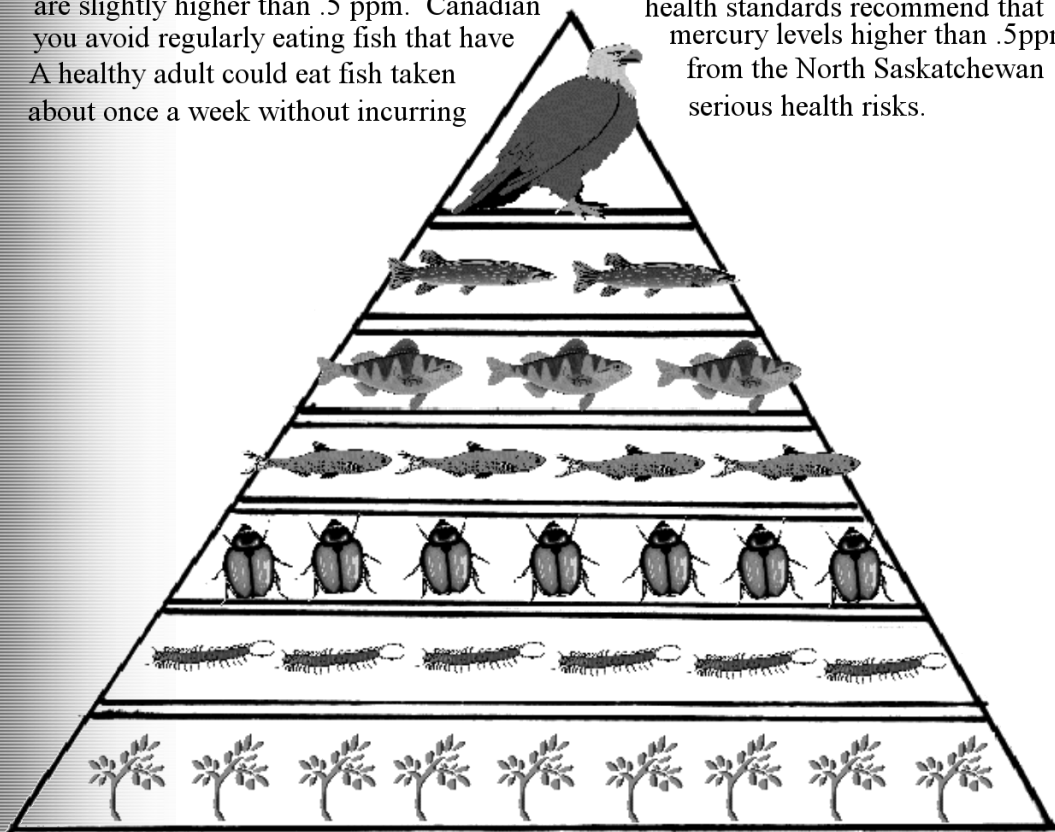
FINISH



START

Bio-accumulation wasn't a problem 200 years ago because there weren't any toxic chemicals or pesticides in the environment. But now, with an increasing number of heavy metals and pesticides being released into the water, bio-accumulation becomes a serious issue. Substances like methyl mercury cause problems because they don't occur naturally. Our bodies can't process and excrete them as easily as we do other foodstuffs and chemicals. As a result, these toxic substances often end up accumulating in our fat cells. If we get high enough concentrations of them in our system, it could lead to serious health problems. Ingesting high levels of methyl mercury can cause kidney damage, nausea, and even damage to the brain and nervous system.

Most of the fish taken from the North Saskatchewan river have mercury levels that are slightly higher than .5 ppm. Canadian health standards recommend that you avoid regularly eating fish that have mercury levels higher than .5ppm. A healthy adult could eat fish taken from the North Saskatchewan about once a week without incurring serious health risks.



Pregnant women and children, however, should refrain from eating any fish that have such a high mercury content. Pregnant women retain a lot more of the nutrients that they consume, and they pass these nutrients on to their fetus. They retain mercury the same way they retain nutrients - and this mercury can be particularly damaging to the fetus. The same is true of young children. Because their bodies are growing so rapidly, they retain more of the nutrients and minerals that they consume.

I guess this just helps to prove the old saying: YOU ARE WHAT YOU EAT!