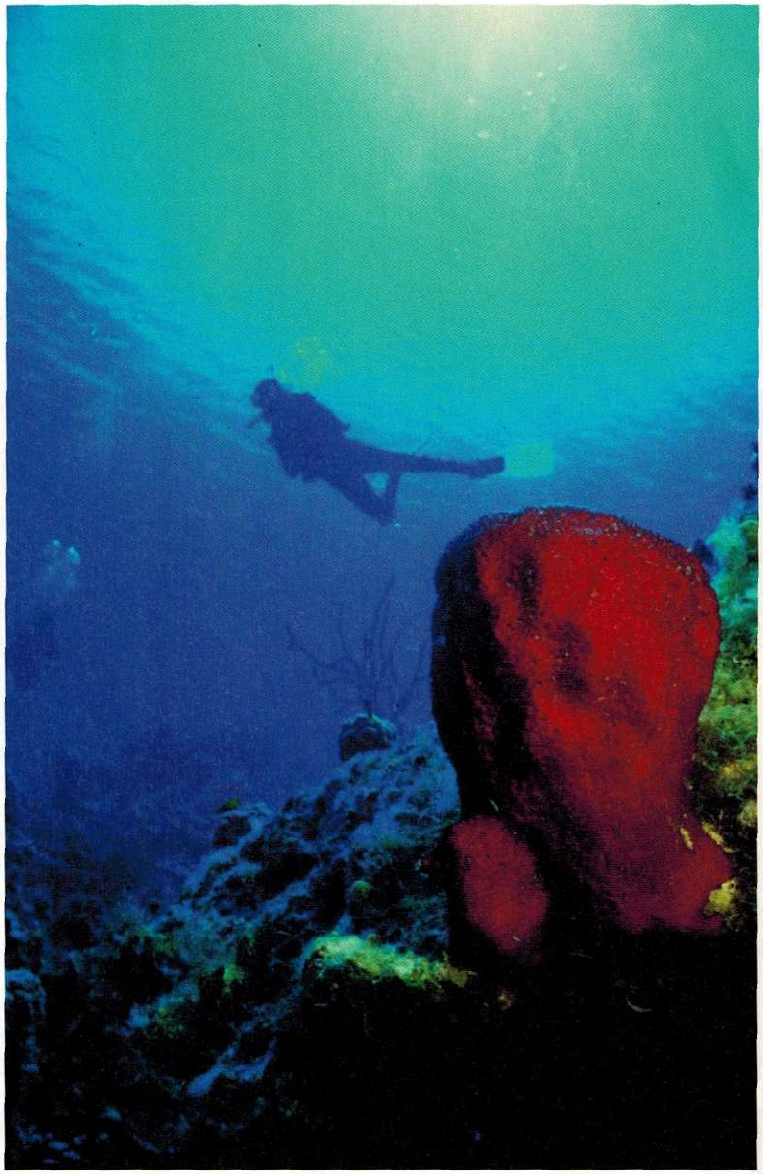
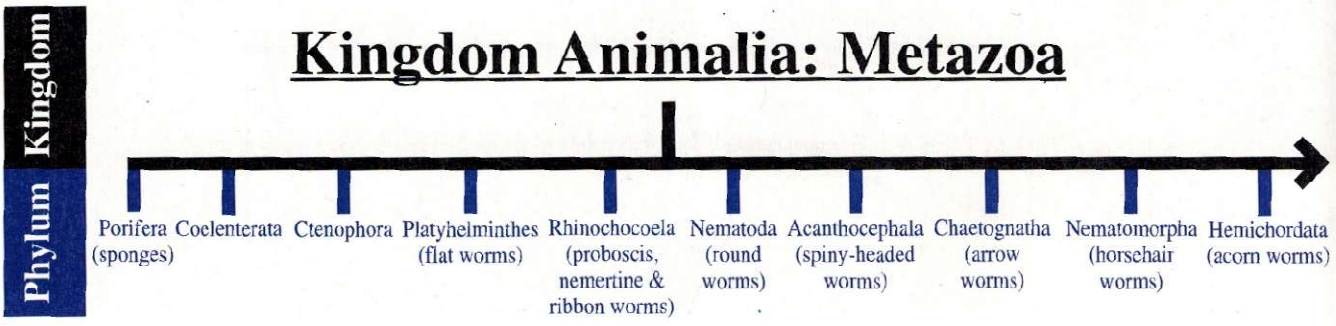
18: *Phyla of the "Changed Animals"*

Climbing the evolutionary ladder from the protozoa we find higher levels of organization. Organisms are grouped into **mesozoa** and **metazoa** based on how organized they are. The simplest **multicellular** organisms (those having many cells) are the mesozoa ("middle animals"). These organisms are simple **parasitic** worms. Parasitic means that they live at the expense of some other organism. They often suck nutrient-rich fluids right out of the other organism, but they don't usually kill the organism or they lose their source of food.

The **metazoa**, meaning "changed animals" can be larger in size because they have different kinds of cells that work together to bring things in, take things out, protect the whole organism, and perform other duties that enable them to live in a wider range of habitats. Because of the various cell types, organisms at this level begin taking on a variety of shapes that are not possible among colonies of identical cells. The metazoa include all other phyla of animals from the simple to the complex.



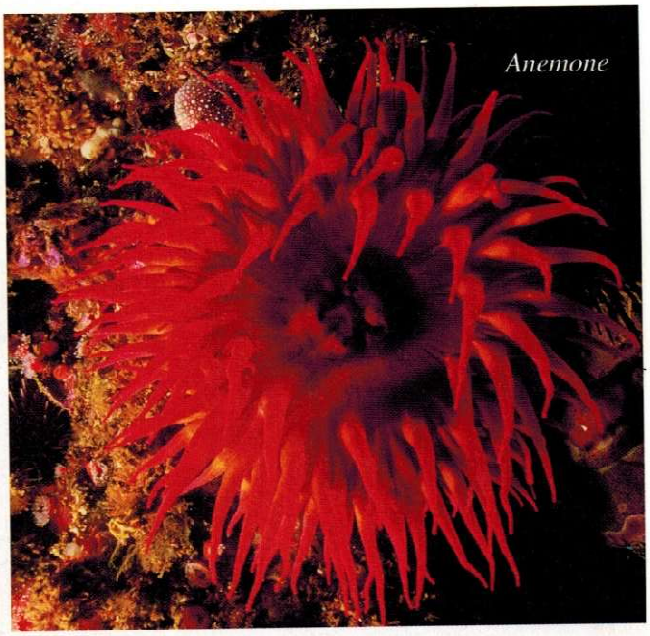
A strawberry sponge of the phylum Porifera.



The next set of organisms in terms of their simplicity is the phylum **Porifera**—the sponges. There are many types of these animals that live in the sea and a few that live in fresh water. Sponges are made up of several types of cells. Notice that, in one big jump, we have gone from organisms that are groups of identical cells to organisms that are made up of several types of cells. The organisms that would bridge this gap in evolution are absent from the fossil record. This is another of the more important objections to the theory. Many such gaps exist.

Jellyfish, anemone, soft coral (or sea fan), sea pen and coral of the phylum Coelenterata. Most of these soft-bodied animals are built on a radial body plan, radiating from the center like spokes on a wheel.


Jellyfish


Anemone


Soft coral (sea fan)


Coral


Sea pen

Notice how each of the different phyla is identified by the basic body plan of the organisms making it up. The next two phyla, called **Coelenterata** [sē-LEN-tuh-RĀ-tah] and **Ctenophora** [ten-AH-for-ah], include animals that are laid out on the **radial** body plan. Radial bodies have a center and "radiate" from the center like the spokes of a wheel. These simple animals have many cell types that do different things. They are no longer groups of tissues but are arranged into simple systems, including digestive, nervous and muscular. Organisms included in these phyla are hydra, medusa (jellyfish), sea anemones [a-NEM-ō-nēz] and corals.

The next step up the supposed evolutionary ladder is composed of a large number (perhaps a hundred thousand) of different types of worms. Perhaps because radial symmetry is not a workable plan to support more complex digestion, the worms' body plan is what we call **bilateral**, or "two-sided." The left halves of their bodies are mirror images of their right halves (more or less).

Many "higher" organisms are bilaterally symmetrical. In the simpler ones, the body plan is like a sac that has a single opening through which everything enters and exits. In the more complex ones it's more like a drinking straw, where everything goes in one end and out the other.

These simple worms include flatworms, ribbon worms, the tiny rotifers, nematodes (which include several human parasites such as hookworms, pinworms and trichina worms), and several kinds of worms that are not well studied because they don't seem to have much impact on humans or

Comb jelly of the phylum Ctenophora. This is a football-shaped, translucent, jelly-like blob that glows in the dark. You would hardly think that anything fitting that description could be a living animal.

ecology. Because of the bilateral symmetry in the simple worms, evolutionists hold that they are our closer evolutionary relatives than sponges and jellyfish.

This is a photograph of a large, tropical flatworm of the phylum Platyhelminthes. This one is about 5 centimeters in length. Flatworms may be found under rocks in streams in North America, but they are best viewed under a microscope because they are usually only a fraction of a centimeter in length.

Exercises:

True or false?

1. Metazoa include all animals that are not considered microzoa (or protozoa).
2. Mesozoa are a type of metazoa.
3. The terms protozoa, mesozoa and metazoa represent three different groups of organisms.
4. Metazoa represent a higher level of organization than protozoa.

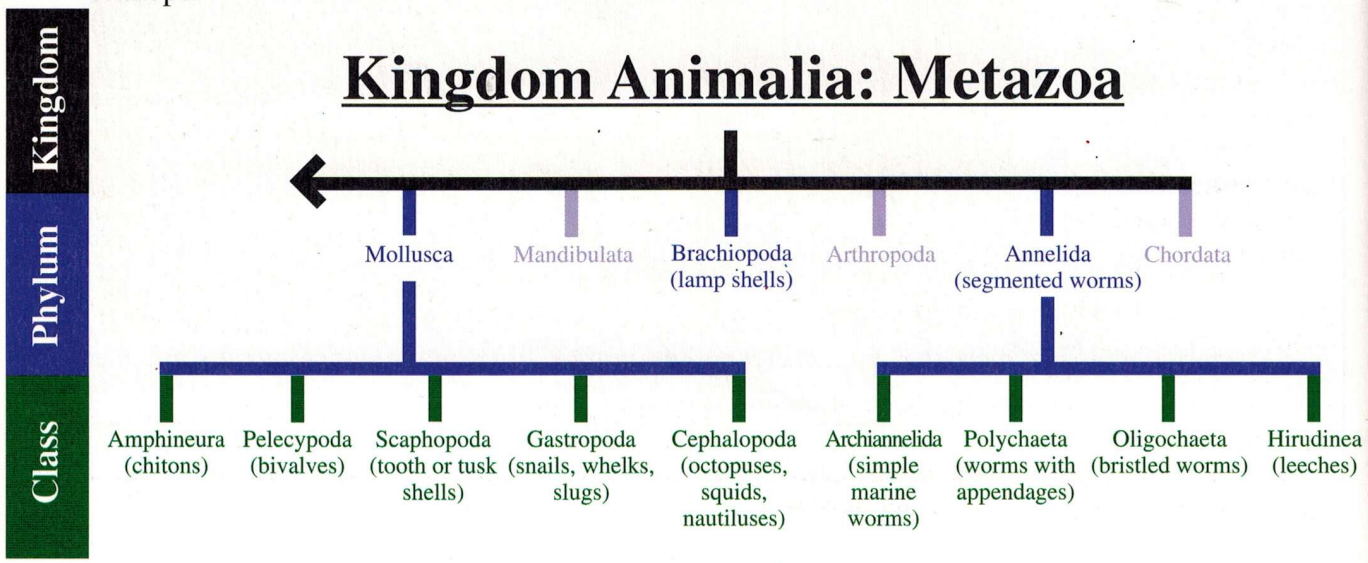
19: *Do You Have a Cavity?*

The next step up is to those organisms that have a **body cavity**. A body cavity is extra space around the digestive tract where other organs can grow and develop. An organism with a body cavity has all features necessary for the placement of complex systems, including respiratory, circulatory, and reproductive. In lower animals, for example, a fluid that resembles blood may be squeezed into sacs in the outer tissues. This does the same things as, but is a very limited substitute for, the heart, veins, capillaries, and arteries that make up the circulatory systems of higher animals. Animals with body cavities—the so-called eucoelomate [ū-SĒ-lō-māt] animals—begin with those having few organs and simple systems, and extend all the way up the evolutionary ladder to humans.

The first several phyla of eucoelomates, which are not generally well known, have tentacles surrounding their mouths. They include the **Brachiopods**, also called "**lamp shells**." These still exist in a few hundred species but are much better known for their extinct forms. In the fossil record they number in the tens of thousands of species. Lamp shells have an outer shell consisting of either one or two parts. Their general shape is similar to that of a clam.

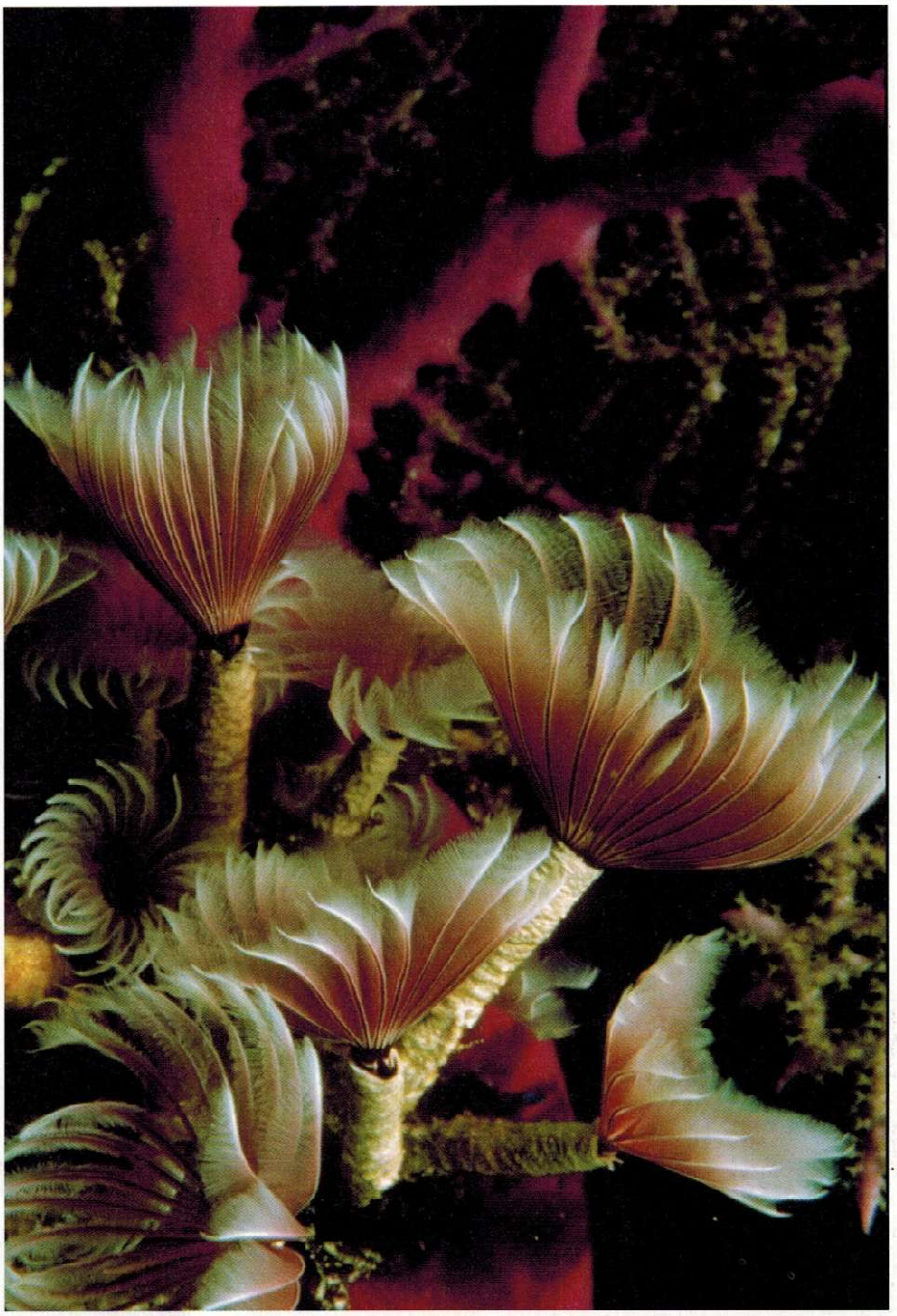
The next phylum, **Tardigrada**, is made up of animals generally less than one millimeter long. They are often called "water bears." Although they really don't have much to do with bears, somebody must have seen one and thought it looked cuddly. They are often found clinging to a small twig or fiber, as you might find a koala (which also isn't a bear!).

The phylum **Mollusca**, represented by 100,000 or more species, includes many well-known animals. It also includes some that are not as well known, such as **chitons**. These are **marine** animals (animals that live in the ocean). They are covered with hard plates that protect them, and feed on algae and other plants while moving along the floor of ocean shallows. Another of the lesser-known mollusks is the worm-like animal called a **solenogastre** [sō-LĒ-nō-gas-ter]. Better-known mollusks include the **gastropods**. These are mostly single-shelled animals whose shells are often coiled. Does this sound familiar? Gastropods include the snails, as well as abalone, whelks, slugs, periwinkles, and cowries. From single-shelled, gastropod mollusks, we move along to the double-shelled, pelecypod [pā-LĀ-si-pod] mollusks. These include marine and freshwater clams, freshwater mussels, and scallops.



The last class of mollusks is the **cephalopods**. This class is best known for its well-developed head, which gives the group its name (*cephalo* = "head"). The group includes squids, nautiluses, cuttlefishes and octopuses. These animals have highly developed circulatory and nervous systems. The most striking feature of the nervous system is the eye, which in the octopus is surprisingly similar to that of a human. Although there are differences, the thought that two such similar organs could evolve separately in two such unrelated organisms is astounding. (Evolutionists do not consider octopuses and humans to be close relatives.) Evolutionary theory calls this process through which two organisms develop similar features **convergent evolution**, meaning that the two organisms "come together" in their characteristics by adapting to similar evolutionary pressures.

On the other hand, for those who acknowledge God as the Designer of the animals, the occurrence of similar design features in such distant organisms does not

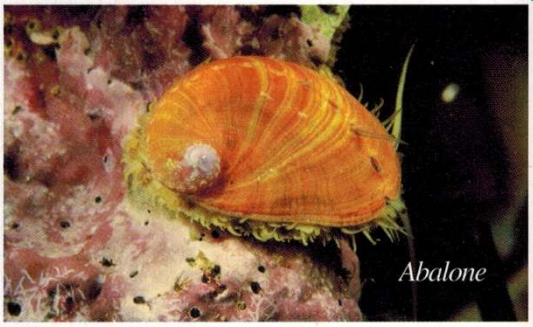


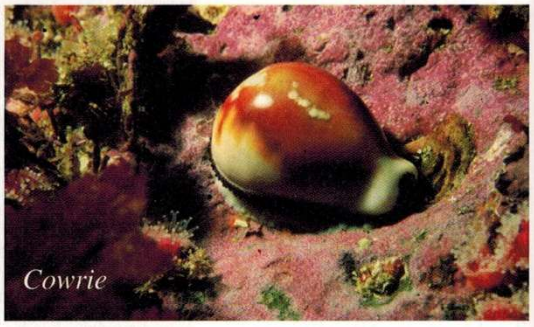
This specimen is a beautiful worm—a polychaete (fan worm) of the phylum Annelida. Compare the beauty of this creature with the homeliness of its terrestrial neighbor, the earthworm. The earthworm is an oligochaete from the same phylum.

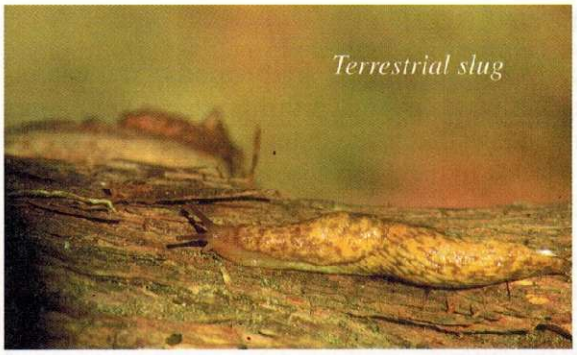
require imaginative theorizing; indeed it offers a strong argument for a single and purposeful designer. From this perspective God is seen to have used the same design basis for creating two distinct organisms, just as an engineer might borrow features from a car in designing a truck.

The next phylum of eucoelomates is **Annelida**. Animals in this phylum are worms with segments. These include the (mostly marine) **polychaetes** [PAH-lē-kēts] and the **oligochaetes** [AHL-i-gō-kēts]. It may be hard to think of a worm as beautiful, but the tentacle-like appendages that stick out from the bodies of many polychaetes can take on brilliant colors and sway with the wave movements of the sea. Fan worms are a particular example of the beauty of these animals. The oligochaetes include some famous worms like *Lumbricus*—the lowly earthworm. It may surprise you to know that there are earthworms that are not so lowly. They can reach nearly three meters in length and two centimeters across. (Lunch time!) The oligochaetes also include the leeches.

The animals on this page and the following are representatives of the phylum Mollusca.



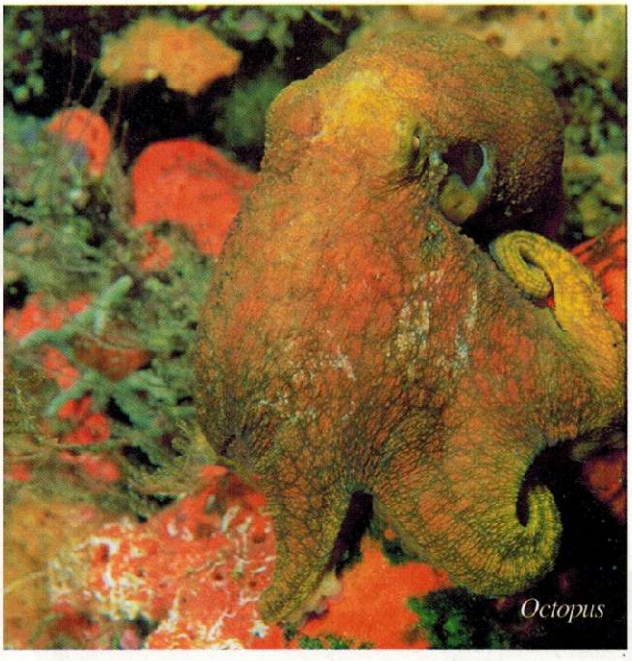



Terrestrial slug


Scallop


Sea slug (nudibranch)


Squid


Octopus

Exercises:

1. Which of the following statements is more accurate:
    a. Tardigrades and mollusks are organized the same.
    b. Both tardigrades and mollusks are examples of eucoelomate animals, all of which have body cavities.
2. The distinguishing feature of eucoelomates is a body cavity that allows for the placement of sophisticated _____ (gosarn).