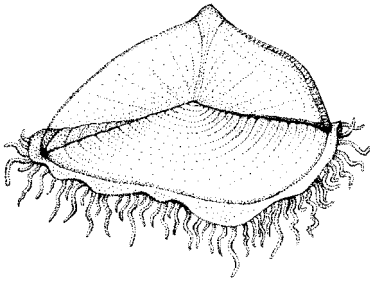
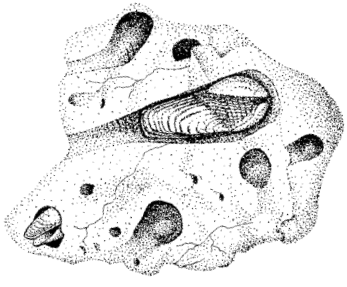
What is all that weird stuff you find on the beach?

Flotsam,



Jetsam,



and

Wrack

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Sea Grant is a unique partnership with public and private sectors, combining research, education, and technology transfer for public service. This national network of universities meets the changing environmental and economic needs of people in our coastal, ocean, and Great Lakes regions.

Revised by Vicki Osis, Extension Sea Grant, Oregon State University.
Artist: Laura L. Hauck. "Beach ball," p. 5, by Barbara B. Gleason

Flotsam," "jetsam," and "wrack" are words with romance about them, each meaning more or less the same thing—items washed onto the beach from the open sea. A combination of tides, waves (storm), and winds brings this bounty to the beach walker. What you might see changes from day to day, season to season, and year to year.

Walking the beach can be a year-round activity. Obviously, you must beware of storms. Never go near logs in the surf. You should even stay away from logs on wet sand if the waves are pounding. A sneaky wave, even though relatively small, can lift a large log and tumble it onto you.

You have a little over six hours between high and low tide. Consult a tide table and plan to begin exploring two hours after high tide. Tables are usually available at marinas, sporting goods stores, chambers of commerce, and a variety of other coastal businesses.

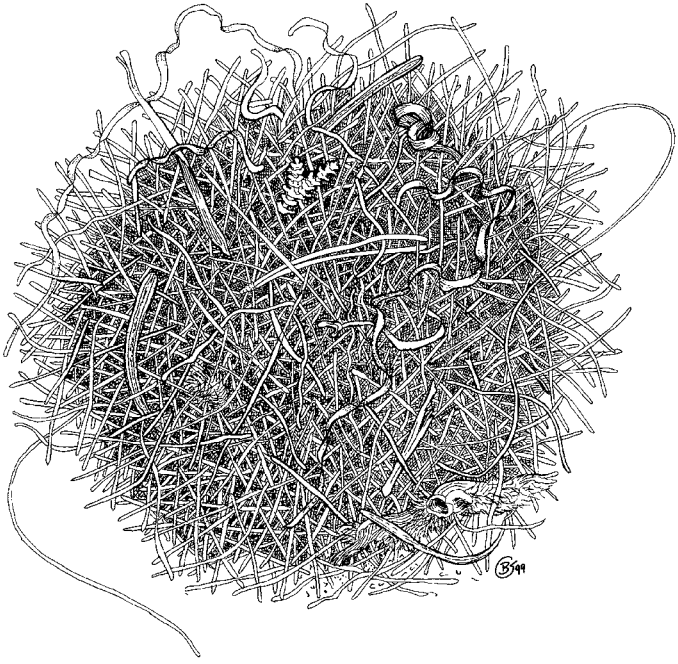
This booklet is intended to help you better understand your visits to the shore, whether you are a casual beach walker or a dedicated beachcomber. It does not cover driftwood or most kinds of rocks; for help in identifying these items, see the titles listed under "For Further Information" (page 22).

Agates

One of the treasures found on Oregon beaches is agates. These stones are found in gravel deposits in beach cliffs and are deposited on the beaches each winter as the bluffs erode. Formed through heat and pressure, agates take on many different colors and patterns. They can be clear to orange to blue gray in color and often have a milky exterior. They are dense and hard enough that they polish into gleaming stones that are popular with rock hounds. The best time and places to collect agates are winter beaches with gravel beds exposed by storms and waves.

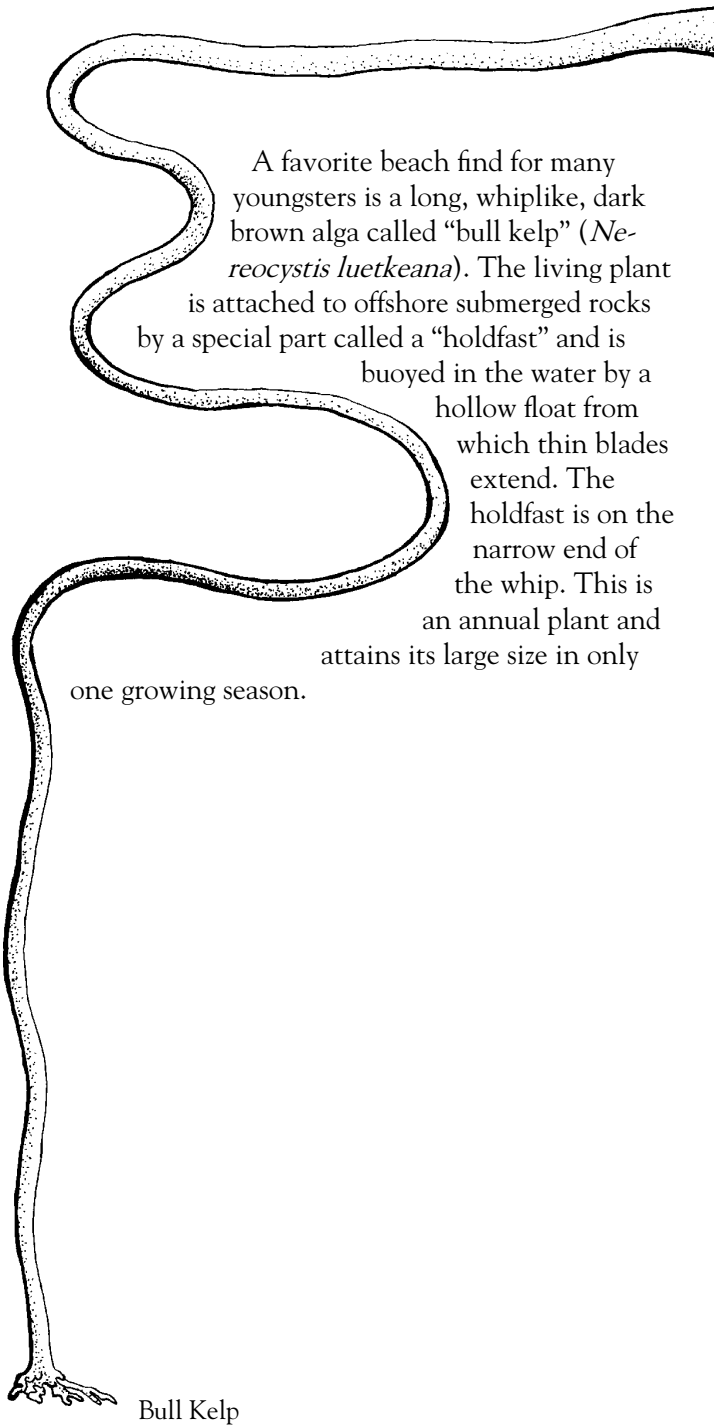
Beach Balls

Often found after stormy winter weather, these balls of stems, twigs, and grasses are formed by the rolling action of waves, collecting whatever materials are in the surf. These materials may include surf grasses from rocky intertidal areas, eroded dune grass stems and roots, fishing line, snail eggs, and even pine needles that have washed onto the beaches. Sometimes sold in gift shops as "whale burps," beach balls have no connection to whales, and new balls are formed every year.

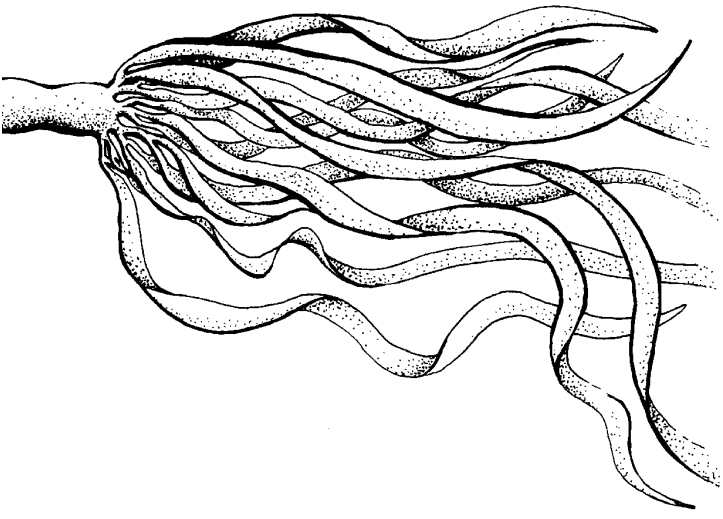


Bull Kelp and Sea Palm

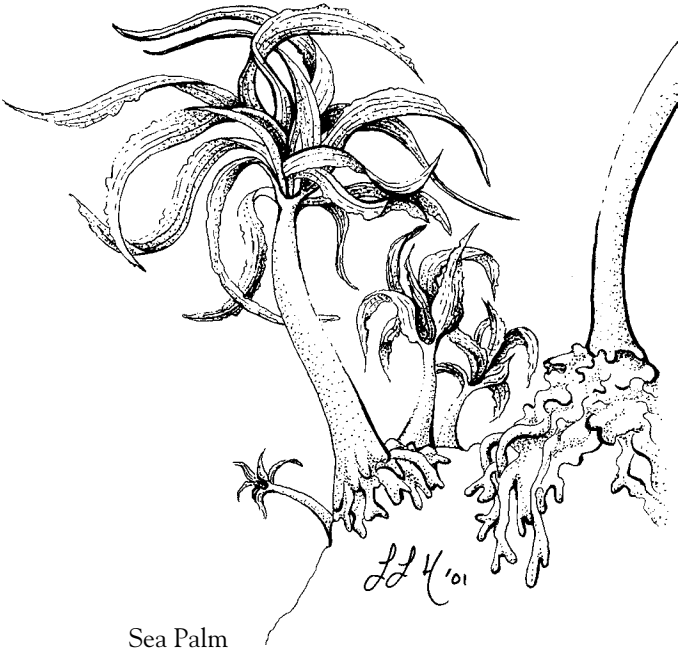
A favorite beach find for many youngsters is a long, whiplike, dark brown alga called "bull kelp" (*Nereocystis luetkeana*). The living plant is attached to offshore submerged rocks by a special part called a "holdfast" and is buoyed in the water by a hollow float from which thin blades extend. The holdfast is on the narrow end of the whip. This is an annual plant and attains its large size in only one growing season.



Bull Kelp



Another often-seen alga looks like a small, olive-green palm tree. Naturally, its common name is "sea palm" (*Postelsia palmaeformis*). This pliable but hardy plant lives attached to rocks in tide pools only where the waves pound the hardest. When you see this plant alive on tide pool rocks, be wary of big waves! It, too, is an annual.

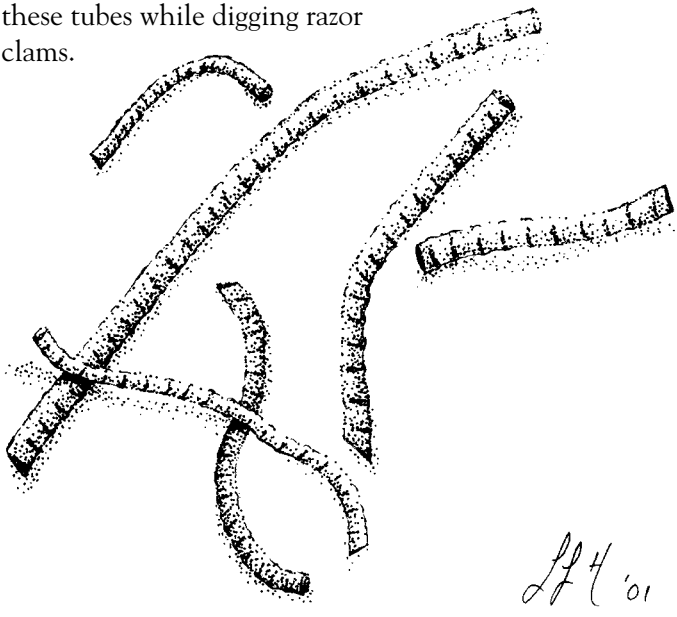


Sea Palm

Cellophane Tube Worms

You may come across masses of small, many-ringed, transparent tubes blown high up the beach in the dry sand. These are former homes for another species of worm, *Spiochaetopterus costarum*. As with the rock-forming worm described under "False brain coral," it has no common name. Would you like to call it the "'cellophane tube worm"?

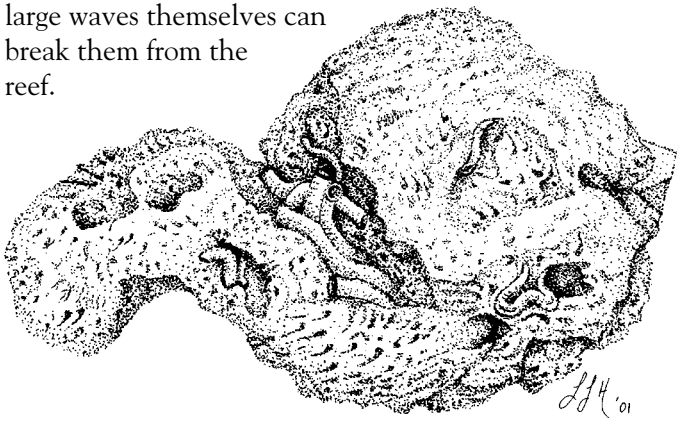
The animal lives just beyond the low-tide line in sandy bottoms. At times of heavy surf, particularly during low-tide periods, the sand is lifted and moved around, dislodging the animals and their tubes from the bottom. The animals disappear without a trace, but wave action brings in their light tubes, and winds blow them up to where you found them. You may also find these tubes while digging razor clams.



False Brain Coral

While walking down the beach after a strong winter storm, you might find a gray, rounded rock, perhaps grapefruit-sized, riddled with hundreds of tiny oval holes and a few larger round holes. What is this? A longtime coastal resident might tell you that you found a piece of "brain coral." This is an error. Rock- or reef-forming corals are found only in warm, semitropical to tropical seas. Your prize is the home of a colony of worms with the gruesome name *Dodecaceria fewkesi*. No common name has been given to them. They are related to tube-building worms such as feather duster worms and calcareous tube worms.

The animals have black bodies with tentacles and gills at the mouth end. To make their rock colonies, each worm extracts calcium carbonate from seawater and deposits the material around its body as a tube. When many worms live on top of one another, the individual tubes fuse into one large mass. The larger colonies are usually found on reefs below low-tide level. Strong winter storms can shift boulders and dislodge the colonies, or the weight of large waves themselves can break them from the reef.



Foam

When it looks as if the beach or surf is littered with billows of soapsuds, the reason is not that someone has dumped a carload of detergent into the ocean. This common sight of spring and summer (and occasionally brief periods in fall and winter) results from prolific reproduction of tiny single-celled plants of the sea called "phytoplankton."

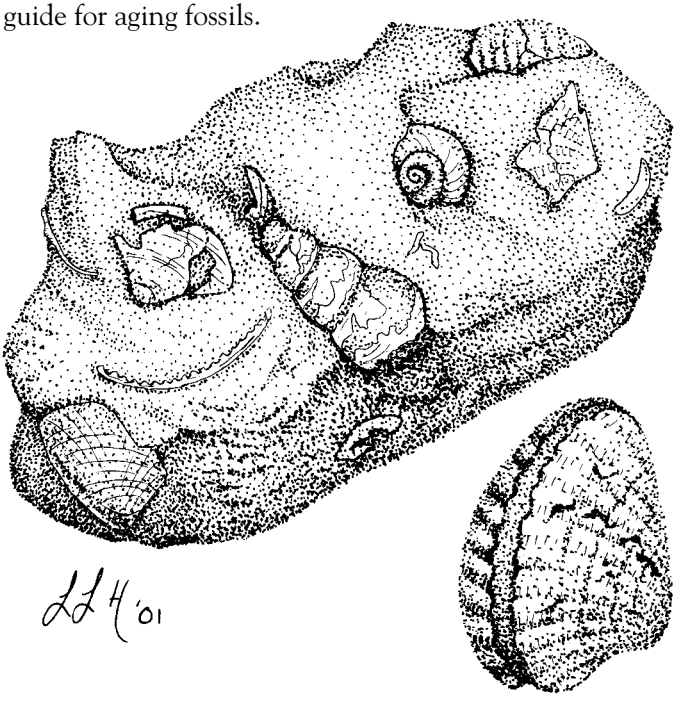
Each individual is housed in a skeleton made of calcium or silica. Conditions of sun, temperature, and nutrients (such as nitrogen, phosphorous, silica, and calcium) stimulate rapid growth and reproduction. When the cycle has run its course, billions of individuals die. Their cell sap tends to glue the skeletons together and to trap air. Surf and winds cause the mass to pile up in the familiar, sudslike masses.

If a microscope is available, you might want to take samples of foam to look at. The skeletons have a beauty that is seldom captured by drawings or photographs. Windrows of phytoplankton remains should tell you that the sea off our coast is producing tons of food for other creatures in the food web.

Fossils

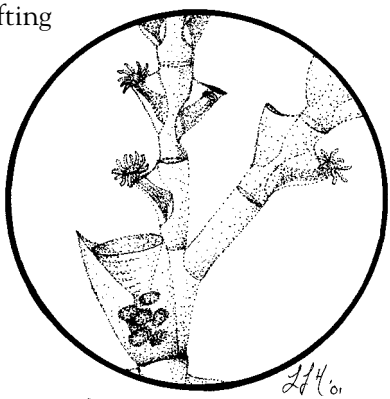
Most of the fossils found in Oregon's central coast cliffs are from the Astoria formation. Layers of sediment contain the fossilized shells of mollusks such as clams and snails, and occasionally you might find whale bones, fish teeth, and turtle shells. Like agates, new fossils are washed onto the beaches as sea cliffs erode during winter storms.

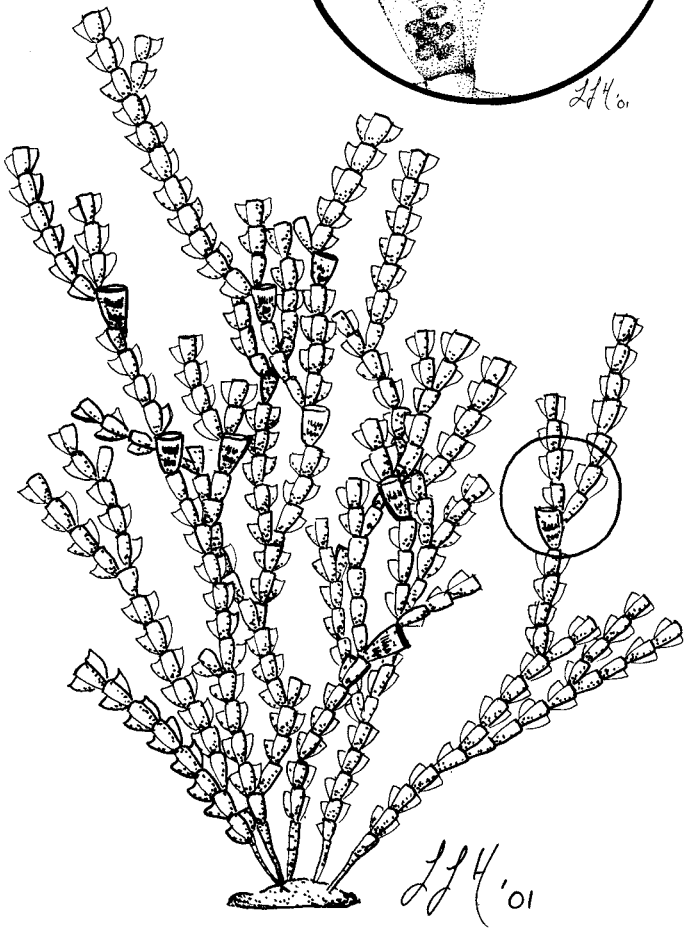
Fossil ages may be determined by the rock strata in which they are found. Some fossils may be found in the soft mudstone layers, which were formed 20 million years ago. The fossil-rich Yaquina formation, formed 15 million years ago, is well exposed in many central coast cliffs. This formation can be used as a guide for aging fossils.



Hydroid

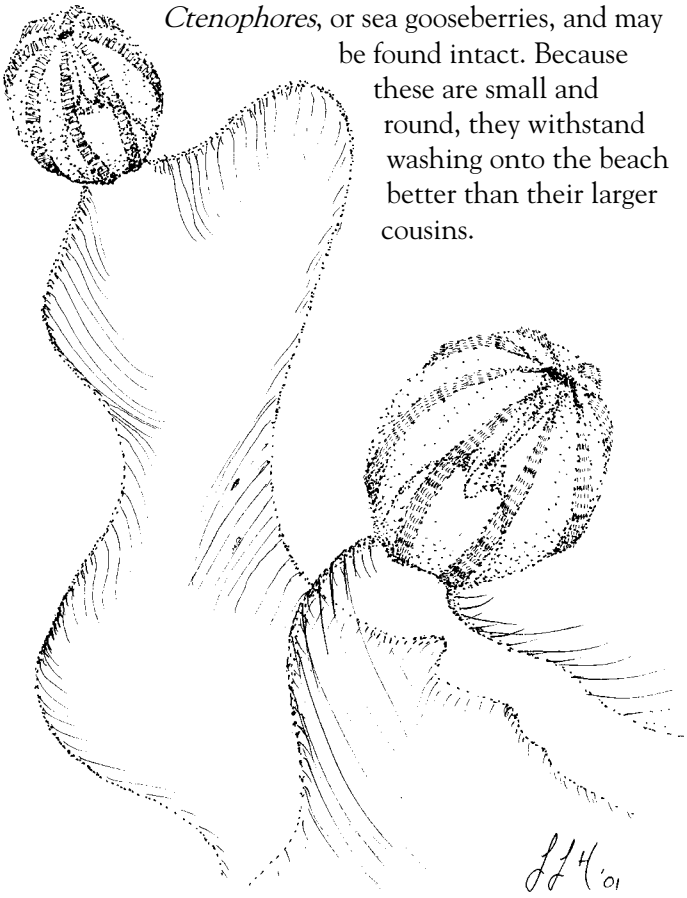
Hydroids fool many people by looking like feathery plants. They are actually colonies of animals living interconnected with specialized functions. They attach not only to rocks but to surfaces such as kelp and crabs. Hydroids are related to jellyfish and have two major life stages—one sedentary (small anemones) and one drifting (tiny jellies). The tufts you find on the beach are composed of small colonies of numerous, tiny, anemone-like creatures.





Jellies

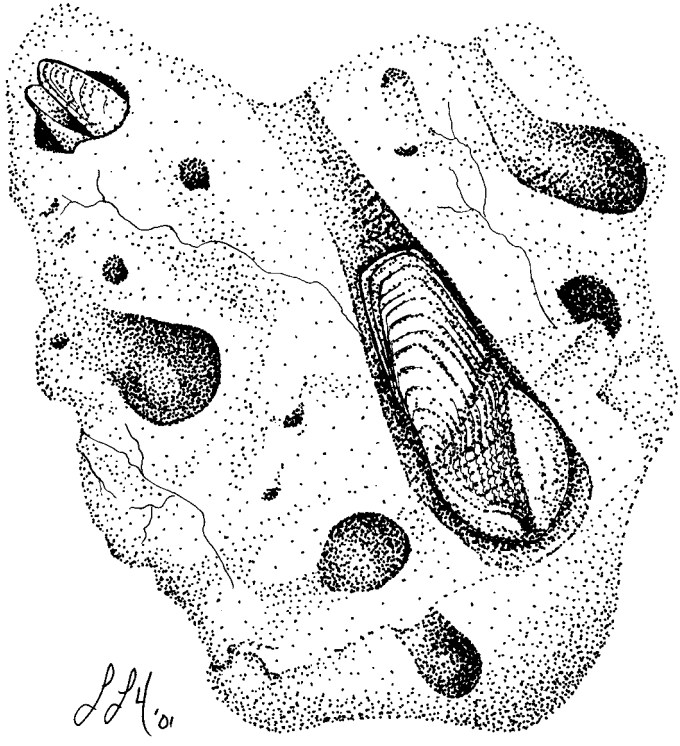
Only in the seas can something as delicate as jellies survive. Water supports the jelly, so it doesn't need muscles or bones for support. It is 97 percent water and has only the thinnest of skins. Washed ashore, jellies start to dry out immediately and are often torn apart. Chunks of larger jellyfish can be found in drift lines. Smaller jellies, the size of marbles or smaller, are called *Ctenophores*, or sea gooseberries, and may be found intact. Because these are small and round, they withstand washing onto the beach better than their larger cousins.



Mudstone with Piddocks

If you find a chunk of brittle rock with symmetrical holes, chances are it's mudstone. Inside the holes you might find oblong-shaped clams called piddocks. The raspy, rounded end of their shell is used to grind out their burrows, where they spend their lives. Breaking the rock will often reveal the shell of the bivalve, completely intact. Living colonies can be found both intertidally and subtidally. These animals are edible, but collecting them requires chipping away the rocks, which destroys their habitat.

Mudstone holes also might contain peapod borers—long, slender, small brown clams that also drill their burrows.



Oil

Did you ever get back to your car or motel room after a beach walk and sadly discover you had stepped into a sticky blob of oil? You cannot always see the blobs on the beach because winds often cover them with sand.

What is this stuff? Where did it come from? The material is usually a heavy crude oil that has been pumped from tankers far offshore. Waves, winds, and currents deposit it on the sand in blobs from the size of a dime to that of a small pancake.

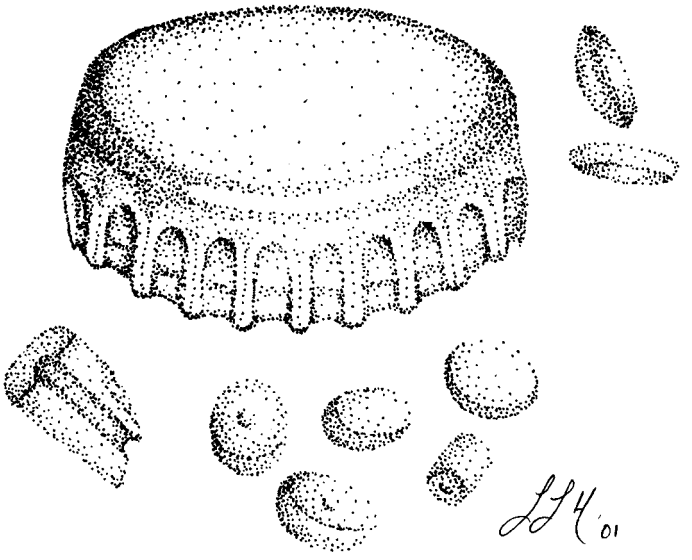
This type of crude has little negative effect on the creatures of the sea, but it is very hard on our carpets. Lighter oils have been responsible for the mass destruction of bird, fish, shellfish, and plant life that has occurred on various shores over the past few years.

Off Oregon's coast there are some small oil deposits. Occasionally, a shift in the bottom structure allows a small amount to surface and be carried ashore. Also, you might sometimes find paraffin; its source is apparently those same offshore tankers.

Plastic Discs

In the past few years, tiny (1/8 inch, or 3 millimeter) plastic discs or rings have been seen more and more on our shores. They can be any color, but most are white, gray, or tan. This is the form in which makers of polyethylene, polypropylene, and polystyrene ship their product to manufacturers of plastic cases for radios, calculators, cameras, hi-fi's, and so on. A common assumption is that these rings get into the sea when storms damage their shipping containers on ships or barges.

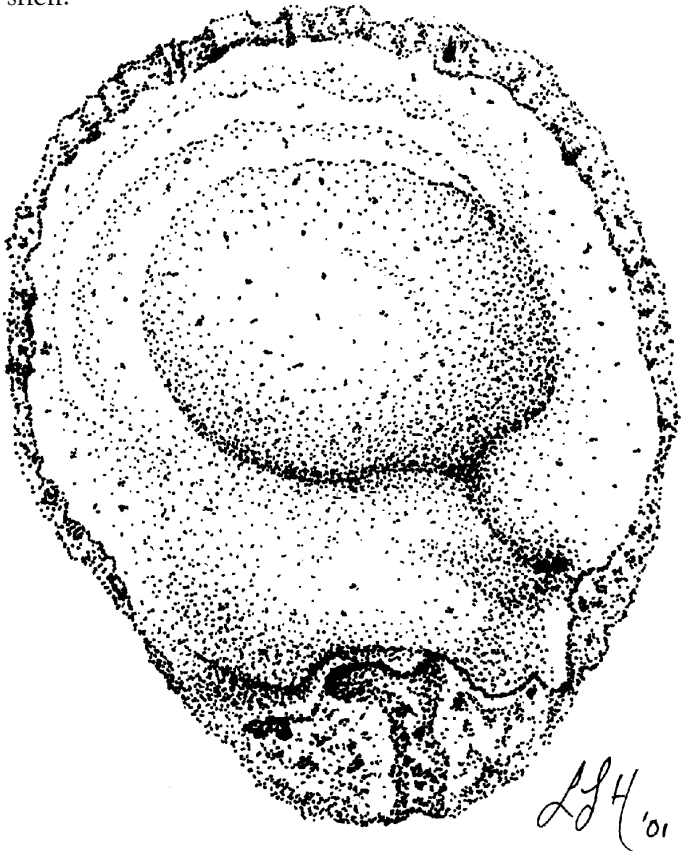
Like most plastics, these do not decompose on the beaches. The action of surf and sand may in time reduce them to even tinier bits, but the impact on living creatures that swallow them is not known. It is easy for the beachcomber to carry a sack and remove plastic cups, bleach bottles, and other reasonably sized plastic items from our beaches—but these tiny discs are another matter.



(Bottlecap shown for size comparison only.)

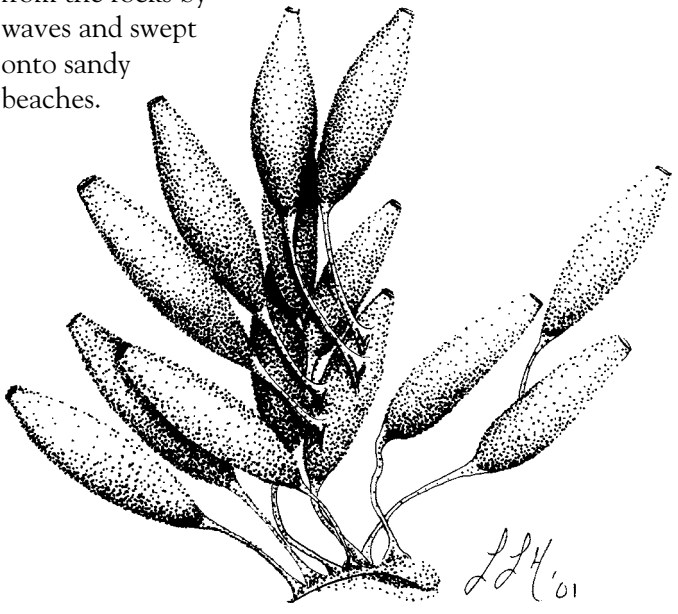
Rock Scallop

Juvenile rock scallops (*Hinnites giganteus*) are difficult to distinguish from other scallops. They can swim about by flapping their two shells. But as they grow older, they will attach one valve (shell) to a rock and become distorted to fit the rock's shape. Rock scallops are prized as food and their thick muscle is extracted and prepared just like scallops. When washed onto the beach, empty rock scallop shells are easily distinguished by a splash of purple color on the interior, next to the hinge. The outer part of the shell is often riddled with small holes left by an encrusting yellow sponge, which can bore into the calcium shell.



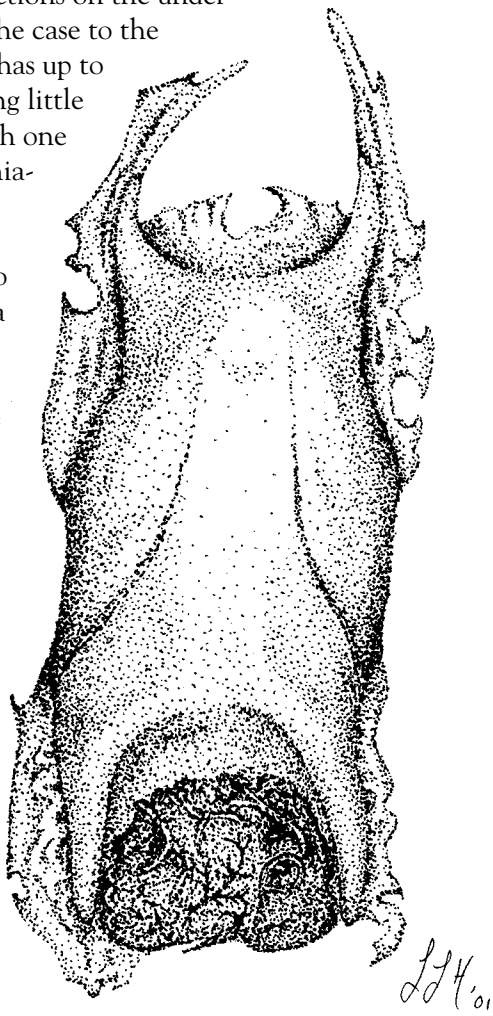
Snail Eggs

Clusters of snail egg cases are often found in the tide lines on the beaches. The cases are produced by a rocky intertidal snail called a welk. Several eggs are deposited in the cases, some of which develop into snails, while other eggs serve as a food supply. Fully developed snails creep away, leaving empty cases that are eventually torn from the rocks by waves and swept onto sandy beaches.



Skate Egg Cases

"Mermaid's purse" is a name often given to the olive to dark brown, horny egg cases of skates or rays. Female skates lay their eggs on offshore reefs and surround them with this distinctive, protective covering. There are fingerlike projections on the underside that hold the case to the reef. Each case has up to seven developing little skates in it. Each one looks like a miniature adult with a large sack of yolk attached to its stomach by a tube. In heavy seas, these may be broken loose and the case washed ashore. Usually, by the time the case reaches the beach, the young have died.



There are five species of skates from our waters with egg cases of this general shape.

Velella Velella

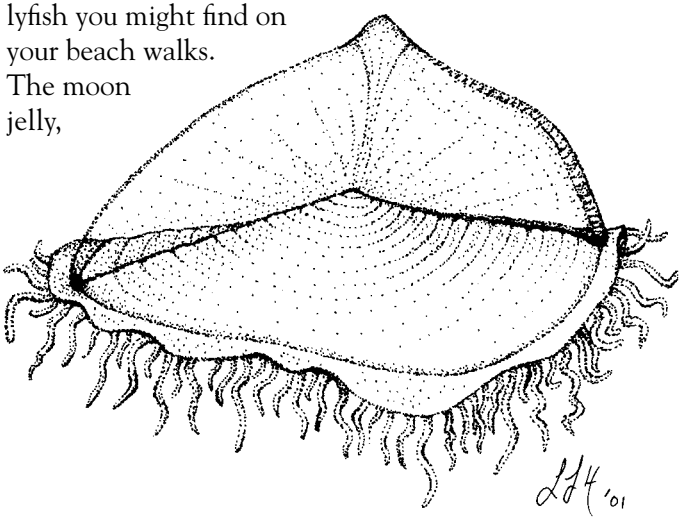
Usually in spring, but occasionally in winter, great windrows of blue- to purple-bodied jellyfishes line our beaches. The scientific name of the jellyfishes is *Velella velella*. A good common name is "by-the-wind sailors," or you might prefer the shorter "purple sailor." Some Northwest beachcombers call them "Portuguese man-of-war," but this is incorrect; the man-of-war lives only in warm waters.

Velella is an offshore resident. Winds blowing gently against its triangular, clear sail move the jellyfish. The sail is set diagonally to the long axis of the animal. On our side of the north Pacific Ocean, their sails are set in a NW to SE direction. On the other side of the north Pacific, the sails are set in a NE to SW direction. In the southern hemisphere, sails are reversed. As long as the winds blow gently, *Velella* tacks at about 45° away from a following wind; this keeps the animal offshore.

When winds are strong, *Velella* loses its tacking ability and begins spinning and more directly follows the wind. Strong westerlies, then, are what drive these animals onto our beaches.

All jellyfish have stinging cells in their tentacles. Most people are not bothered by touching one from our beaches with their hands. You should not rub your eyes or put a finger in your mouth after handling a jellyfish, however, because this could cause you pain—and maybe even more serious problems. You should also avoid walking barefoot through masses of beached jellyfish.

Velella is not the only jellyfish you might find on your beach walks. The moon jelly,



Aurella, usually appears as a flat, clear blob. If enough of the moon jelly remains, you might see four horseshoe-shaped gonads, purple in males and yellow in females. West Coast sea nettle (*Chrysaora fuscescens*) is tan with reddish-orange hues and has very long tentacles. Its sting can be mildly harmful to humans, about as potent as a bee sting.

For Further Information

Audobon Society Nature Guides. 1986. Pacific Coast. New York: Alfred Knopf, Inc.

Moore, Ellen. 1994. Fossil Shells from Oregon Beach Cliffs. Corvallis, OR: Chintimini Press.

O'Clair, Rita M., and Sandra C. Lindstrom. 2000. North Pacific Seaweeds. Friday Harbor, WA: Plant Press.

Snively, Gloria. 1981. Exploring the Seashore. Vancouver, B.C.: Gordon Soules Books.

Notes