What Does the Shell Tell?

by Peggy Williams

The shape of a shell can tell you a lot about how the animal lives (and has lived), what it eats, and its enemies.

Molluscs begin as eggs, and the egg or earliest shell stays with most shells as the very tip, or **protoconch**. The eggs may hatch out to crawling young that look just like their parents, or they may have a larval stage where the tiny, light-weight shell drifts with the currents (this allows them to disburse over a larger geographical area). The shells that hatch to crawling young have a large protoconch because there's no need for a light weight shell; the ones with larval swimming stages (the **veliger** stage) have a small, often translucent protoconch.

Most shells do have a protoconch unless it has broken off (typical of the West Indian Chank), but some, which live near the water's edge or even out of the water, re-use the calcium in the protoconch in their later growth. This is called **resorbing** and results in a **truncated** or broken-looking tip.

Volutes are typical of shells that crawl away, and they have a long egg stage, so the protoconch is large and fat. Some volutes actually brood the eggs within the mantle cavity and appear to be live-bearing.

Smooth Shells

Shells that are smooth and shiny can tell you something. For one thing, when the animal moves about its mantle covers the shell. Now, you wouldn't want to sleep in a dirty bed or have prickles to crawl over all the time, so they keep their shell clean, smooth and shiny. Cowries and Olives are good examples of this.

Olives and some other smooth shells are burrowers, moving under the sand surface (never rock). The smooth shell helps them move more efficiently through sand. The shape helps, too - it's long and slender. These animals have a large , spatulate foot to plow into the sand with and secrete a lot of mucous to help smooth the sand for their passage.

Spines

In bivalves, spines help anchor the shell under he sand, so you can tell that spiny bivalves (the ones that don't attach to something) like to stay in one spot under the surface of the sand.

Smoother bivalves, like Coquinas, allow themselves to be uncovered by the waves and can reburrow quickly to keep from being swept away. But they like to eat the plankton that the waves bring in so live near the edge of the sea.

Angel Wings and their relatives not only have rough, spiny shells, but they don't have a hinge holding the two valves together. Instead, they have extra plates of shell that are attached to the animal, allowing it to move and rotate the shell in various directions to actually dig out the sand and burrow deeper. They don't do this very fast, but it can be done.

Spiny univalves are usually found on rocks and reefs. They like to "hunker down" on the rock and seldom expose much of their bodies outside the shell. Their spines help disguise them in the rocks and provide protection.

Some spiny bivalves, like Thorny Oysters, live attached to rocks. Their spines serve as some protection, strengthen the shell without adding a lot of weight, and gather sponges and other encrusting organisms that camouflage the shell.

It has been proven that some murex shells that live in the intertidal zone have three large protruding **varices** (singular is **varix**) for a good reason: like a plane's wings, they keep the shell upright. When it is dislodged and tumbles about in the surf, it always lands right side up!

Long Skinny Shells

These are burrowers, too. A good example is the Terebras, or Auger shells. They burrow by pulling their shell down under the sand and the long, narrow shell follows right along.

Byssal Notches

Some bivalves hang onto rocks with a set of sticky threads which they secrete, called a **byssus**. The byssus is anchored within the animal, but ithas to get outside the shell somehow, so the shell has an opening for this purpose. If you find a pair of Turkey Wing Arks you will see that the long side of the opening doesn't fit together tightly but leaves a hole for the byssus, called the **byssal notch**.

Open-"Bottomed" Gastropods

Limpets and Slipper shells have such a wide "mouth" on the shell that it appears to have no mouth at all. This indicates that the animal lives on a hard substrate (rock) and seldom moves from that substrate, or else its predators would have an easy time eating it!

Slipper shells are often found atop other shells, on discarded cola cans, bottles, or rocks. Their shell includes a "shelf" that covers the animal's internal organs. They have a wide, strong foot that can cling to their chosen roost and they stay in one place all their lives, so the shell edge conforms to whatever they're sitting on. Therefore, slippers that live on rounded surfaces have a convex shell edge, and those that live inside other shells are concave. They eat microscopic plankton as it comes their way and discharge their eggs and sperm into the water where it mixes with that of others of their species and the eggs are fertilized. Our *Crepidula fornicata* lives in stacks of several shells; the bottom one is a female and upper ones are males. If the female dies, the lowest male turns into a female.

Limpets are usually found on rocks, where they have a "home" spot to which they return after foraging for food. They eat microscopic algae that grows on the rock so their dinner table isn't far away. During certain tide cycles they move away from home to go for groceries, then return when the tide changes. (Some prefer to feed at high tide, others at low tide, depending on where they live - above the tide line or below it.)

Some limpets have a hole in the top of the shell ("Keyhole Limpets"). This is to discharge waste matter. Other shells with holes for the same purpose are abalones and slit shells.

Labial Teeth

Some shells have "teeth" in the aperture. This feature strengthens the edge of the shell and makes the opening smaller, so predators can't get in to the animal as well as they might. Some snails that live among mangrove roots have this as do many land shells, since there are many predators to worry them. These snails don't have an operculum to keep them safe.

Chitons

Chitons are also "open bottomed", with their bodies exposed, so you know they cling to a hard

surface, generally rocks and dead shells. Their shells have eight plates which interlock and the animal can curl over the surface as it crawls from place to place. It can also curl into a ball if it is dislodged from its rock to protect its body.

The Stromboid Notch

Members of the family Strombidae have very long eyestalks. To allow them to look out from under their shells without exposing their bodies to harm, they have a notch in the outer lip of the shell, just above the siphonal canal. One eye peeks out of the siphonal canal and the other out the notch.

A Sharp Tooth

Some shells have a tooth protruding up from the outer edge of the lip, near the siphonal canal. These animals eat barnacles, and the tooth helps them break the barnacle open so they may get at the meat

Flanges

Some shells have a wide and spiky flange to the outer lip. Pelican's Foot shells are an example of this. They live on silty bottoms where they might sink into the silt and be bogged down except that the spikes on the edge of the flange help by penetrating the silt to solid bottom and allowing them to move across the surface of the silt. Other examples of this may be the Venus Comb Murex and Tibias.

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Everything has a purpose. Isn't it wonderful?