

Originally published in the May, 2006, issue of the **Active Page**:

## Exploring Our Little Corner of the World with the Galiano Naturalists

by Dick Chase

In seas covering what is now Galiano once swam the ammonites, an animal with a coiled shell that is now preserved as fossils in the bedrock.

Galiano is underlain by beds of conglomerate, sandstone and shale, originally in total about 4 km thick. The beds accumulated, layer upon layer, from pebbles, sand and mud that flowed down steep slopes under the sea, close to North America into a large offshore basin during the Late Cretaceous, 85 to 60 million years ago. So what lived in the overlying waters? One way to find out is to look at the rocks and search for remains. The clues are elusive, though. Although the ocean was likely teeming with life, like the modern ocean, animals were busy eating each other, dead or alive, so little or nothing of them remained to sink to the bottom of the sea and be incorporated in the sands and muds there. Moreover, most of the animals were soft bodied, and even if their bodies did make it to the sea floor, they would be consumed by bacteria on the bottom. Animals most likely to be preserved were those with a hard shell or skeleton. However, conditions on the bottom were not always good for preservation even of hard parts. If the bottom was gravel or sand in a fast moving current, fragile shells or bones would break up. Even if a shell should be buried with sand or gravel, it might later be dissolved by acidic solutions flowing through the rock. So not all rocks deposited under the sea contain tell-tale traces of things that lived in that sea. The Galiano beds most likely to contain such traces are

the shales that crop out in Sturdies Bay and on Montague Beach. The shales were originally soft mud, laid down in quiet waters an environment friendly to preservation. And here's where we find the fossil ammonites.

Ammonites are not one but a group of species with a distinctive coiled shell that is the source of their name. In Greek mythology, Ammon was a being with a coiled horn on each side of his head. The ammonites, now extinct, are part of a larger group of molluscs called cephalopods. Living relatives are octopuses, squid, cuttlefish and the beautiful chambered nautilus from tropical parts of the Indian and Pacific Oceans. Ammonites were free-swimming sea creatures and thus were widely distributed through the world oceans.

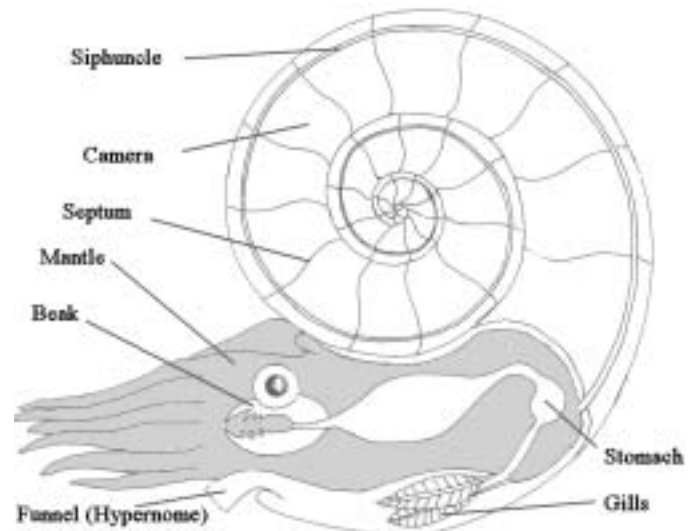


Illustration of ammonite adapted from a figure by Phil Eyden in [www.tonmo.com](http://www.tonmo.com), used with permission

Ammonites had a shell of aragonite (calcium carbonate) that had many chambers that were formed one after another in an ever

growing coil. Each chamber was larger than the preceding chamber. The animal itself lived in the last, largest chamber. The chambers were connected by a thin tube called a siphuncle, through which the animal could pump water or gas to make the shell more or less buoyant. The body had a large eye and tentacles like a squid or octopus. With their tentacles the ammonites captured smaller swimmers. In turn they were hunted and eaten by larger animals. The thin walls that divide the coil into chambers are called septa. The septa have very convoluted shapes. Where the septa meet the outer shell, a complicated suture is formed.

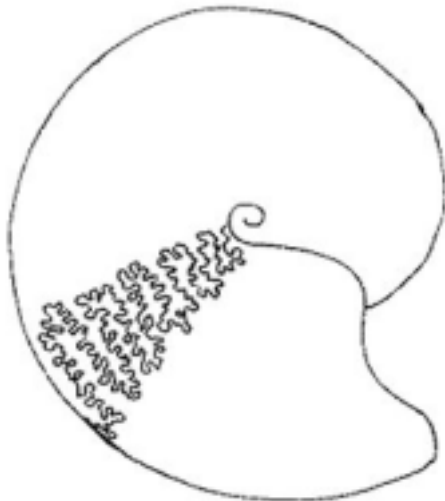
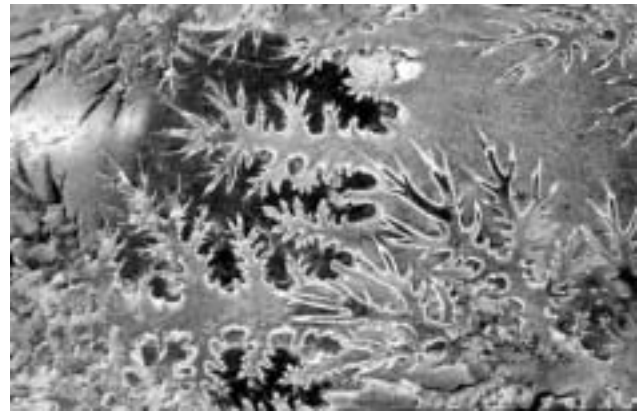


Illustration of suture adapted from a figure by Phil Eyden in [www.tonmo.com](http://www.tonmo.com), used with permission

The shape of the suture was simple in the earliest ammonites, found in strata hundreds of millions of years old, and became more convoluted in later species. Each species survived one or two million years and was replaced by species with a recognizably different suture. The ammonites were wiped out 65 million years ago at the same time as the dinosaurs, and the bedrock of Galiano is of an age to

contain fossils of the last ammonites to live before the extinction. Several species of ammonites have been found in rocks on Hornby Island; others are known from Salt Spring. All have very complicated sutures. Reproduced below is a photo of the suture of *Pachydiscus*, an ammonite from an outcrop of slightly older strata at Collishaw Point on Hornby Island and now in the Vancouver Island Paleontological Museum at Qualicum Beach.

Photo courtesy of Graham Beard, used with



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To see the beauty and diversity of ammonites that appeared through geological time, go to Google Images on the web and search for 'ammonites'.

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### Natural Mysteries

Last month's mystery was: Why are butterflies called butterflies? They don't eat butter, and they are not made of butter. True, but the wings of some butterfly species are the color of butter, as is the feces of other species. But the people who study these things say that color has nothing to do with it. The modern word butterfly comes from the Old English *butterfleoge*, literally 'butter fly'. Some people say that's because the butterflies were thought to steal milk or

butter. Others say that witches took the shape of butterflies when they came to steal milk.

This month's Natural Mystery: What is the advantage for nuthatches to go down a tree head first?

Have an answer? Send your thoughts to [galianonaturalists@gulfislands.com](mailto:galianonaturalists@gulfislands.com). Have a Natural Mystery of your own? Let us know, and we'll try to answer it.

THE GALIANO NATURALISTS are a group of curious explorers who enjoy observing, marveling, and sharing information about the natural world around us. Come join us. ([galianonaturalists@gulfislands.com](mailto:galianonaturalists@gulfislands.com))