Seeing the Value

The Importance of Fossils

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British Columbia has a great diversity of scientifically important fossils. They range in age from a few thousand years old to more than 540 million years old! These fossils include mammoths, shells, whales, plants, insects, dinosaurs, birds, arthropods and many other forms of life.

An extinct Cambrian trilobite from British Columbia. *Olenoides serratus* (Rominger, 1887)

Fossils tell us about the journey of life from the very distant past to the present. For example, fossils have taught us about some of the first life on this planet, which appeared more than 4.1 billion years ago; the first plants on land, from about 470 million years ago; the early evolution of dinosaurs, about 240 to 220 million years ago; and the evolution of modern mammals and birds about 65 million years ago.

By studying fossils we can determine the causes of extinctions and whether these are relevant to life today. By exploring fossil environments on land, in lakes and in oceans, we can learn about global changes (for example, in temperature, sea level and seismic activity) and how ancient life was impacted by these changes. We study how fast the change was, whether it affected the whole planet or a region, whether it caused extinctions, and whether it happened a few thousand or millions of years ago. These questions are very relevant today, since we live during a time of dramatic changes primarily caused by humans. Have you considered what your neighbourhood will look like in 50 or 100 years? What animals and plants will be living there? Have you noticed any recent changes such as trees dying or new animals living on the landscape? What will the ocean, rivers and lakes look like in the future?

Change is normal and is one of the driving factors of evolution. Life that adapts to changes will likely survive into the future. Life that does not adapt to changes usually becomes extinct.

Fossils also help us understand the rocks in which they were found. Paleontologists know what sorts of plants and animals were alive in certain time periods, so we can determine the ages of rocks by studying fossils. This can help us understand the geology of a region. Fossils have taught us about how and when continents and islands moved around the world on oceanic plates, collided and uplifted to form mountains, and when ocean floors plunged below continents to become recycled and re-mineralized before spewing out in volcanoes on land or at spreading ridges in the deep ocean.

A late Cretaceous ammonite (an extinct squid-like creature with a shell) found near Nanaimo, British Colombia.

Fossils have commercial value, too. Some are sources of energy (coal, oil and gas). Some, such as limestone and phosphates, are mined commercially. Some fossils are beautiful and are made into jewellery.

More importantly, fossil and modern shells are part of the global carbon sink where they bind carbon. This affects the amount of carbon dioxide in the atmosphere. Better knowledge of this process will help us to understand aspects of climate warming and cooling.