



Geology of the Darebin Creek catchment

The geological history of the Darebin Creek catchment is a fascinating story of ancient sea creatures and spectacular volcanoes. The catchment of the Darebin Creek begins north of Melbourne past the town of Woodstock through Wollert, Epping, Bundoora, Ivanhoe and Alphington. It is here that the Darebin Creek meets up with the Yarra River which then flows through Inner Melbourne and into Port Phillip Bay.

Silurian Period

Over 420 million years ago during the Silurian period, Central Victoria including the Darebin catchment was covered by sea.

Temperatures then were higher than the present day and the sea was warm and shallow with a range of shelled creatures that lived in its waters. These creatures included gastropods (snails), Brachiopods and bivalves and began to establish themselves in increasing numbers to ultimately replace many of the marine animals that died out during the preceding Ordovician period.

Today, fossil evidence of these creatures remains. Over one hundred million years ago, beginning in the Ordovician and into the Silurian Period sediment slowly accumulated in this region sometimes burying these animals. This process called sedimentation, contributed to the creation of the fossils we find today.

It is from this term that we derive the name 'sedimentary' that describes the sandstone siltstone and mudstone formed in the Darebin Creek Catchment through this process.

Fossiliferous sandstone can be found in the upper part of the catchment running across Epping and Cades Roads near Whittlesea exposed as a result of folding, faulting and uplift in the area.

Devonian and Carboniferous Period

Today we can find examples of the sedimentation that occurred in this marine environment on the eastern escarpment of the Darebin Creek in the Darebin Parklands. Here, the layers of sediment called 'beds' can be seen laid

down upon each other – each, a snapshot in time. Over the coming Devonian period, the waters of the sea basin called the Melbourne Trough were to become shallower and shallower to the point that the water flowed into channels and became rivers, exposing the seafloor. This terrestrial environment remained for many millions of years through the Devonian period. During the Late Devonian and Early Carboniferous over 360 million years ago, terrestrial plants such as primitive ferns and lycopods grew. Some terrestrial amphibians also evolved during this time, their fossilised footprints remaining until the present day in Victoria's alpine region. Rivers that flowed during this time were populated with around 20 species of thick bony plated fish. Fossils from some of the creatures of this time can be found today in the Humevale formation located near the Silurian sandstones north of Woodstock.



Rock formations in the Darebin Parklands, adjacent to the Darebin creek.

Silurian 436 mill yrs ago
Devonian 405 mill yrs ago Carboniferous 360 .mill yrs ago
Permian 290 mill yrs ago Triassic 250 mill yrs ago

Jurassic 205 mill yrs ago
Cretaceous 145 mill years ago

Tertiary 65 mill yrs ago

Quaternary 1.6 mill yrs ago

Permian and Triassic Periods

Eventually the warm temperatures of the Silurian and Late Devonian periods dropped as a result of an ice age that was to arrive during the Late Carboniferous and Early Permian period over 285 million years ago. Very little geological evidence of these times can be seen in the Darebin Creek catchment. By the end of the Early Permian, the glaciers that had covered the land in the last ice age finally receded and the land of the Darebin Creek catchment was exposed once more. During this time, reptiles replaced many amphibians and the sea covered almost the entire state. From the start of the Carboniferous through to the Triassic times insects, ferns and conifers evolved and, towards the end of the Triassic, sharks, fish and sea urchins populated the seas and dinosaurs began to walk the earth. During the Triassic Period the first dinosaurs began to evolve. Mass extinctions of many animals and some plants also occurred due to the significantly cooler climate.

Jurassic and Cretaceous Periods

The next period to follow was the Jurassic. This was the time when dinosaurs began to dominate Australia ranging in size less than half a metre to over 26 meters in length. The Cretaceous period was to follow which marked the extinction of almost all the dinosaurs. Around five species still however, remained in Victoria.

Temperatures began to rise, and water became an active element on Victoria's mainland with large fast flowing rivers crossing the land.

Tertiary Period

Following the Jurassic period came the Tertiary period. The climate during this period was warm with an increase in rainfall. By this stage a range of mammals, birds, reptiles, amphibians and flowering plants proliferated the land and much of Victoria was covered by rainforest. Very little evidence however, can be found in the rocks of the Darebin Creek catchment for this period of time.

Quaternary Period

The Quaternary period followed the Tertiary. During this period, a huge amount of volcanic activity took place. This activity brought about the widespread development of volcanic or igneous rocks within the Darebin Creek catchment. Between six to seven million years ago during the Quaternary, over 400 volcanoes erupted from Seymour to Portland the lava spreading over 15,000 square kilometres. This lava also flowed through the Darebin Creek catchment and solidified to form a range of volcanic rocks that included basalts, scoria and ash. In the Darebin Creek catchment, basalt is now a major component of the landscape. Large sheets of this rock that we commonly know as bluestone lay over the surface of the soil. Basalt in the Darebin Creek catchment was mostly a result of eruptions from a volcano located at Hayes Hill north of Woodstock. These eruptions occurred between 4.5 and 0.8 million years ago leading to a number of lava flow events. Evidence of this volcanic activity can be found at the old Boral Basalt quarry in Bundoora, now a landfill site owned by GB Landfill was used as a quarry for over 30 years to supply Melbourne with crushed rock. Profiles cut into the earth demonstrate four lava flow events which can be seen by the breaks in the basalt, changes in its patterns of cracking and variations within the vesicular or bubble patterning in the rock. When examining basalt flows, horizontal and vertical cracks can often be found. These cracks are called joints and are a result of the cooling and shrinking process of the lava. Vesicles or small bubbles can also often be found. These bubbles are created by the accumulation of pockets of gas from the lava as it cooled.

Another example of this volcanic activity can be seen on the Woodstock – Merriang Rd. Here, in the road cutting is a large column of igneous rock (probably basalt) sitting within the mudstone bedrock. This formation is a result of hot lava forcing itself up through the sedimentary rocks to land. The lava left in the tube eventually cooled and solidified leaving a column of igneous rock in the profile of the bedrock.

For further information please contact the Darebin Creek Management Committee on 9499 4454 or visit our webstie at www.dcmc.org.au