

Trent Nature Areas: Geological History

The Rise and Fall of Mountains

About one billion years ago, subterranean rock, which stretched from Peterborough to Labrador, was compressed and folded upward into a mountain range higher and more rugged than the present-day Rockies. Many of these formations were subject to enormous heat and pressure and the resulting metamorphic rocks formed the base layer of the bedrock in the Trent Nature Areas today. This mountain building was followed by a period of relative geological stability when erosion became the dominant land-shaping force. For the next 450 million years the mountains wore away until they were undulating hills.

The Inland Sea

Inland seas, that once covered the Michigan Basin and the Gulf of St. Lawrence, spilled over much of North America about 480-460 million years ago, covering it in a warm, shallow sea. Over the next 20 million years the progressive accumulation of large quantities of sediment, marine life and vegetation, cemented into beds of shale which, under pressure, further solidified into limestone. Limestone over metamorphic rock is the predominant geologic formation underlying the Trent Nature Areas today. Evidence for the former Ordovician Sea is the many marine fossils encrusted within slabs of limestone scattered around the campus and in exposed rocks along the Otonabee River.



Glaciation

The Ordovician Sea gradually disappeared with the rebounding of the earth's crust. Hundreds of millions of years later, there were, during the last 2 million years (the Pleistocene Age) four periods of glaciation. The familiar terrain of Symons Campus is the legacy of the last of these glaciations, the Wisconsin. The glacial advance during the Wisconsin covered this region in a sheet of ice up to three km thick and receded only 12,000 years ago. Soil, rock, and till from the Canadian Shield were deposited in characteristic landforms that are readily recognizable on the Symons Campus, such as the Lady Eaton Drumlin and Canal Nature Area drumlins.

Drumlins, of which there are over 4,000 in southern Ontario, are elongated hills with a characteristic asymmetrical shape: a steep slope, the "stoss", giving way to a more gently sloped "lee" end. Those in the Peterborough Drumlin Field are oriented in a south- southwest direction, indicating the movement of ice from the northeast.

Also, when the ice melted, some granite boulders (glacial erratics) that had been carried down from the Canadian Shield were deposited and can be seen on the ground in some of the Trent Nature Areas, and along field boundaries to where they were moved by settlers during clearance of the land for farming.

The melting Wisconsin ice sheet generated large quantities of water that drained via several well-developed spillways into Lake Iroquois (present day Lake Ontario). The Otonabee River follows the course of one of these major Wisconsin drainage channels. The bank of the spillway can be observed on the west side of Highway 28, skirting the Highway 28 Woods Nature Area. For a more detailed account of the glacial features of the Peterborough area see Adams & Taylor (1992).

Reference

Jones, R., M.G. Fox and J. S. Marsh. 2002. **Draft- The Stewardship Plan for Trent University Nature Areas.** Trent University, Peterborough, Ontario.