

# *Landscapes around Canberra*

*- a geological  
excursion for  
students of  
all ages*

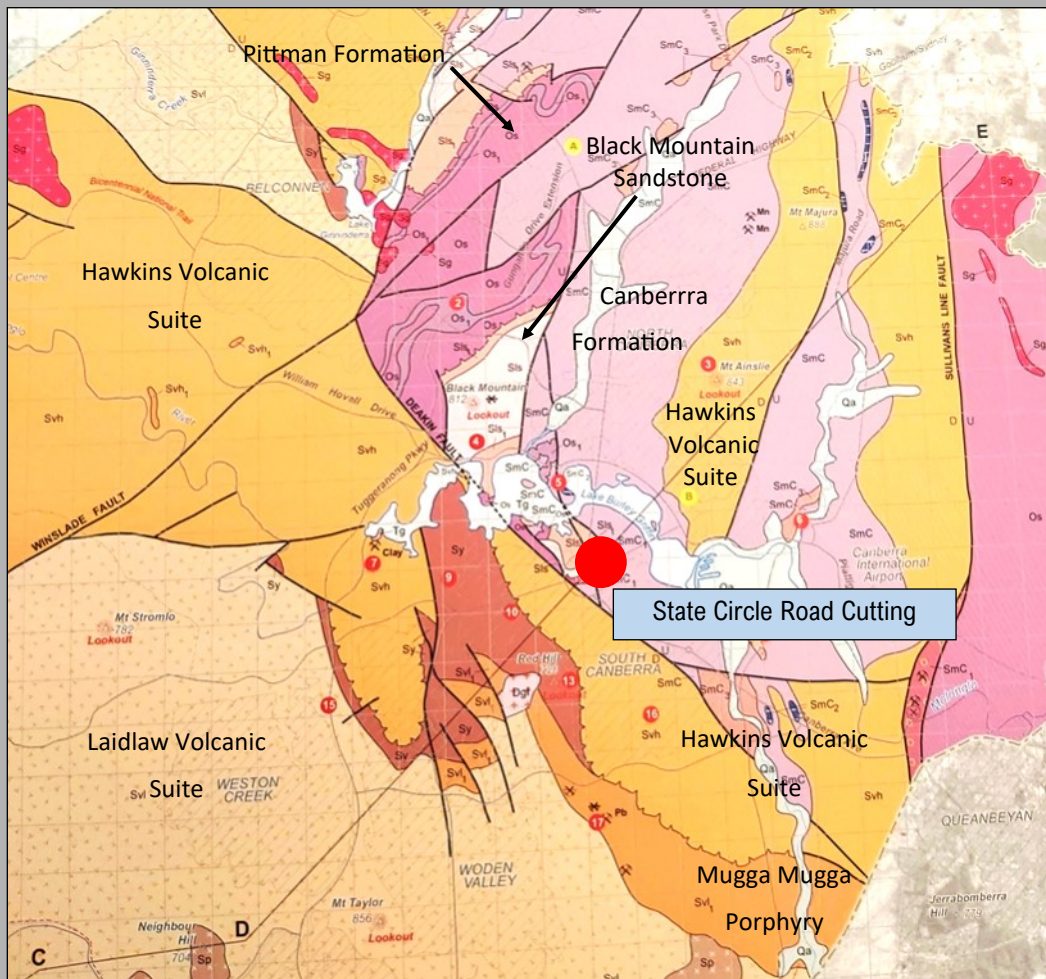


**State Circle**

Rock outcrops around  
Canberra tell us about the early  
history and evolution of the  
region's landscapes.

# Canberra region landscapes

*The landscapes around Canberra had their origins over 400 million years ago during the Paleozoic geological era on the margins of the supercontinent called Gondwana. Since those formative years the landscapes have been shaped and deeply eroded to reveal the rocks we now see at outcrops around Canberra.*


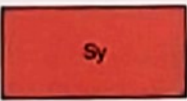


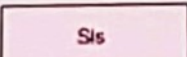

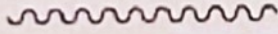



Simplified geology extract from — Geological Map of the ACT, 2008.



This publication was compiled for the ACT Division, Geological Society of Australia, by Douglas Finlayson.

# Geology Map Legend

Era	Late Silurian	Laidlaw Volcanic Suite including Deakin Volcanics		Sv1 <sub>2</sub> Shale and volcanoclastic sediments Sv1 <sub>1</sub> Rhyodacitic lava Sv1 Rhyodacitic ignimbrite
	423.0 Ma	Yarralumla Formation		Sy Shale, limestone, volcanoclastic sediments and calcareous horstfels
		Hawkins Volcanic Suite		SvH <sub>1</sub> Limestone SvH Dacitic ignimbrite
	Early Silurian	Canberra Formation		SmC <sub>3</sub> Tuff, ashstone SmC <sub>2</sub> Limestone, calcareous horstfels SmC <sub>1</sub> Sandstone and grt SmC Shale, siltstone
		Black Mountain Sandstone		Sis Quartz sandstone
Paleozoic		State Circle Shale		Sis <sub>1</sub> Shale, siltstone
	443.8 Ma		 Intense folding and faulting	
	Late Ordovician	Pittman Formation and Adaminaby Group		Os <sub>1</sub> Black graptolitic shale and chert Os Sandstone, siltstone, shale

The Canberra region is in the southeastern part of the Lachlan Orogen (or Lachlan Fold Belt), a geological province that stretches from near South Australia to the Australian southeast Tasman Sea coast.

During the Paleozoic era this province was subjected to major orogenic (mountain building) events, the Benambran Orogeny Phase 1 (444-440 Ma) and Phase 2 (431-428 Ma) and the Tabberabberan Orogeny (about 400—370 Ma).

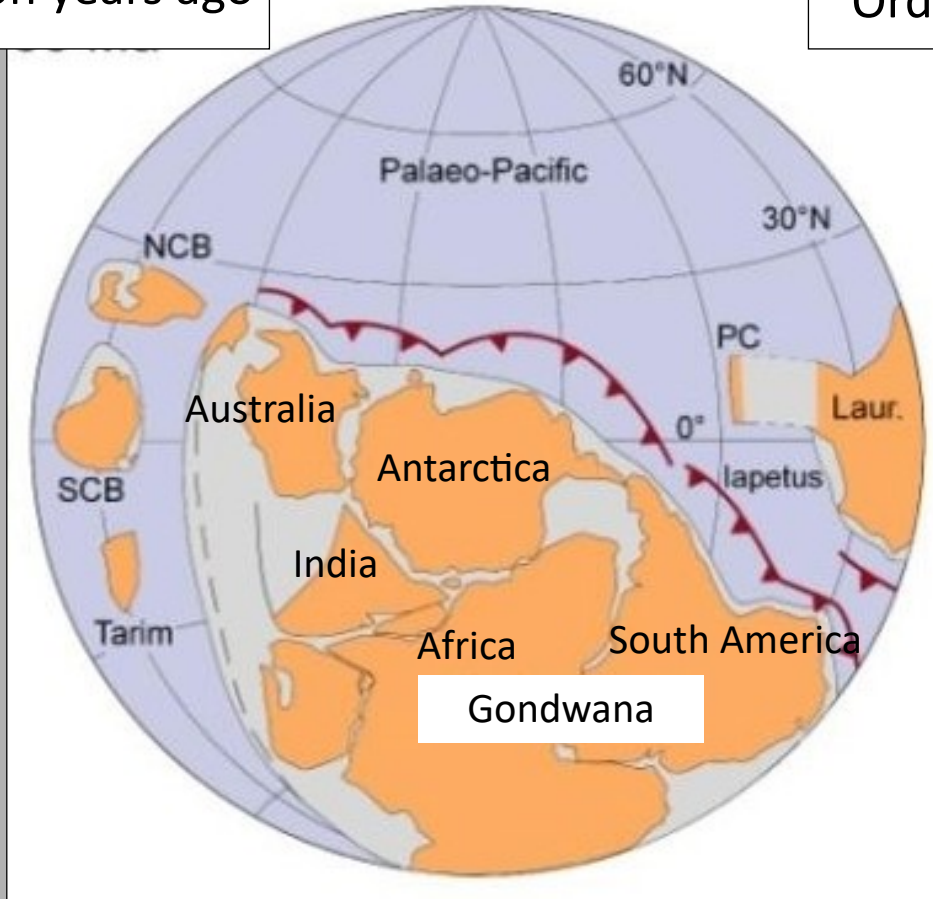
Ma = million years ago

Where has Australia been in the past?

## Paleogeography

480 million years ago

Ordovician



From — Li and Powell, 2001.

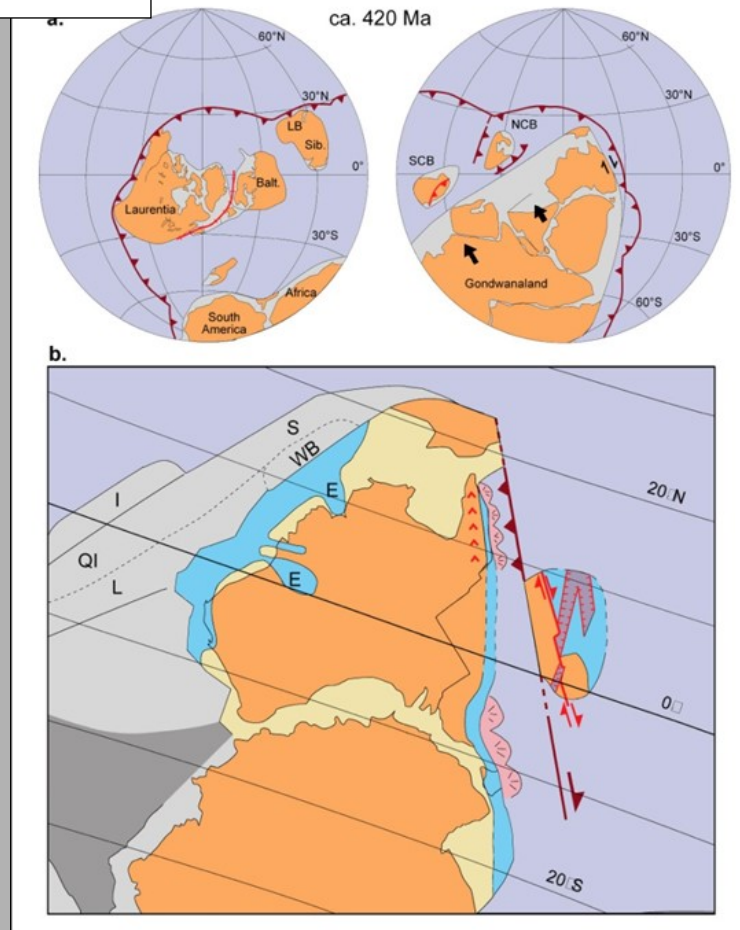
*During the early part of the Paleozoic era Australia was part of the Gondwana supercontinent that also included India, Antarctica, Africa, and South America.*

*Australia was surrounded by warm waters north of the Equator. The Paleo-Pacific Ocean lithospheric plate was colliding with Gondwana and there were subduction zones, with associated volcanoes and earthquakes, dipping under its Australia-Antarctica-South America margins, much like the tectonic processes happening today under Japan and Indonesia.*

# Paleogeography

420 million years ago

Silurian

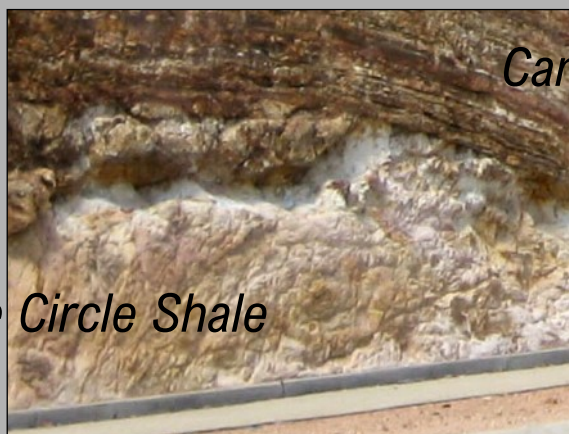


*During the later part of the Paleozoic era, during the Silurian geological period, Australia was still part of the Gondwana supercontinent and still at tropical latitudes with the Paleo-Pacific Ocean lithospheric plate still colliding with Gondwana with consequent subduction zones, volcanoes and earthquakes.*

# *State Circle Road Cutting*

The structural unconformity exposed in this road cutting through Federation Mall between Old Parliament House and the present-day Parliament House separates the Camp Hill Sandstone deposited about 425-428 million years ago (Ma) and the underlying older State Circle Shale deposited about 435 million years ago (Ma). Both formations belong to the Silurian geological period.

Close examination of the older shale indicates that it was folded, uplifted and eroded before the sandstone was deposited on top. Subsequent tectonic events have folded and fractured/faulted the sandstone sequences.



*Camp Hill Sandstone*



*State Circle Shale*

# Access

*The State Circle road cutting is most easily accessed by parking ( 2 hour free parking on the road) on Federation Mall facing Parliament House and walking through park-land down to the pedestrian sidewalk beside the road.*

*Follow the road cutting towards Civic and examine the rock face.*



# *The Unconformity*

The relationship, shown by discordance between the layers in the two geological units within the State Circle road cutting and which geologists call an unconformity, represents a break in sedimentation in middle Silurian times and the transition between two major tectonic cycles across southeast Australia, the Benambran Tectonic Cycle (about 490-428 Ma), and the younger Tabberabberan Tectonic Cycle (about 428-385 Ma). It is thought that the duration of the mid-Silurian break could have been several million years.

The State Circle Road Cutting is a heritage-listed site.





# *State Circle Outcrops*



# State Circle Outcrops

*Prior to bridge excavations (about 1971)*



Graptolite fossils (*Monograptus exiguus*) have been excavated from the State Circle Shale.

The Camp Hill Sandstone (a Member of the Canberra Formation) is fossiliferous, containing corals, trilobites, and brachiopods.

# *Under Parliament House*



*Under the Parliament House building as well as along the State Circle road cutting there is a clear break between an outcrop of Camp Hill Sandstone, 422-433 million years old and underlying Black Mountain Sandstone, the same age as State Circle Shale, 430-435 million years old, indicating a dramatic structural boundary between two major tectonic cycles.*



Not open to the public.

# *Enjoy your excursion around Canberra*



*Further information on all geoheritage sites around Canberra can be downloaded from the Geological Society of Australia web site—*

***<https://www.gsa.org.au/Public/Geoheritage/>**  
and look for ACT Sites and Maps on the pulldown menu.*