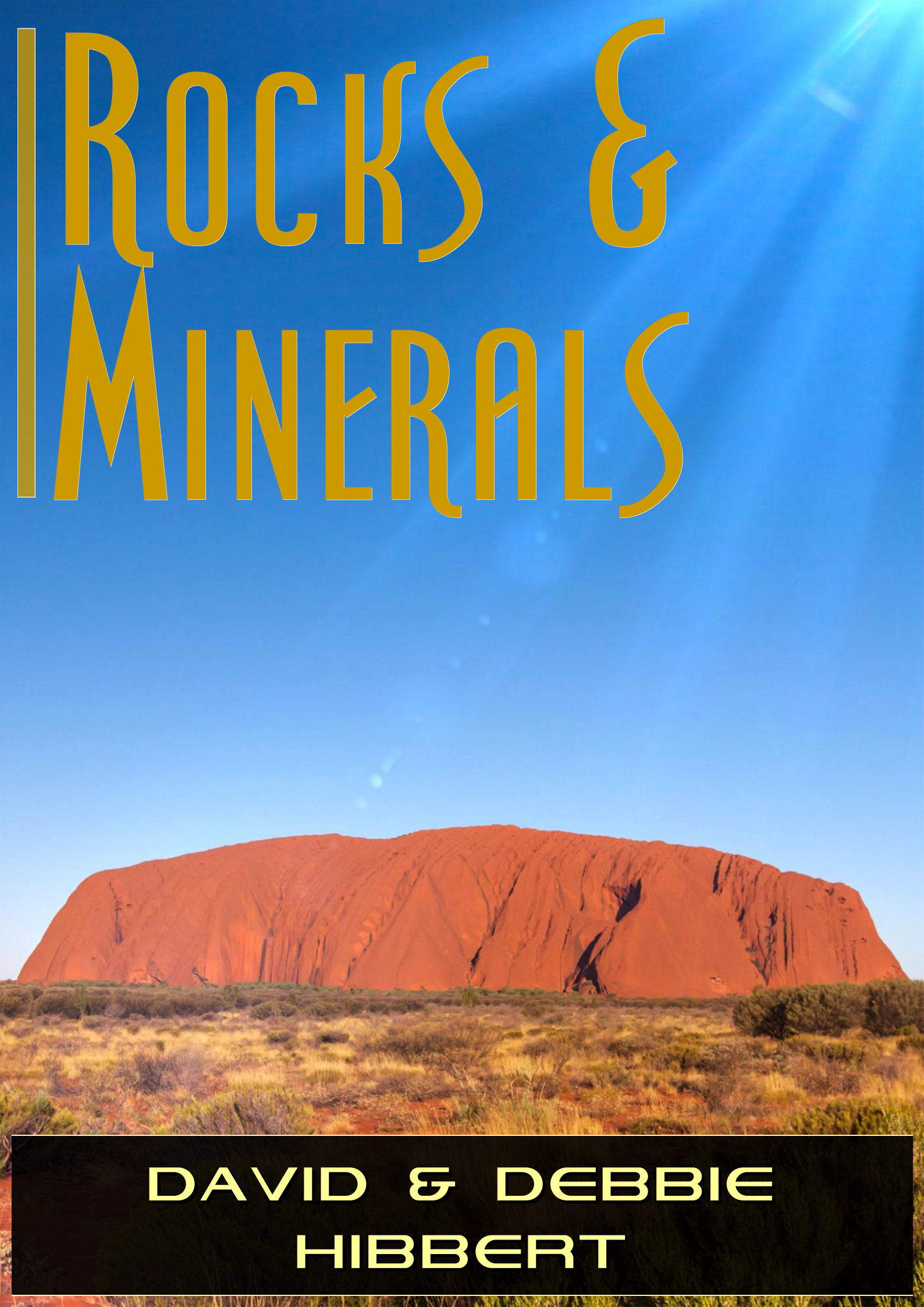


# ROCKS & MINERALS

A large, reddish-brown rock formation, likely Uluru, dominates the middle ground of the image. The sky above is a vibrant blue with a bright sun in the upper right corner, creating a lens flare effect. The foreground is filled with dry, scrubby vegetation in shades of brown and yellow.

DAVID & DEBBIE  
HIBBERT

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# QUICK IDENTIFICATION OF COMMON ROCKS & MINERALS

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# INTRODUCTION



## WHAT IS ROCK?

The Earth has a molten inside and a hard rock crust on the outside. The rock crust makes up less than one percent of the Earth's mass and is where the molten inside (magma) has cooled and hardened into rock (also known as bedrock).

Rock is made of minerals, which have combined in different ways and amounts to form rock (stone). There are now over 5,000 inorganic solid minerals listed by the International Mineralogical Association. These minerals are made up of chemical elements. There are 118 chemical elements known to mankind.

Rock can be large, small, hard or soft, depending on where and how it is formed, and the mix of minerals that have combined to form it. Small rocks are smaller than sand and large rocks can be as big as Uluru (Ayers Rock).

Rock has been categorised into groups that include size, hardness, and where and how it is formed (i.e. igneous, metamorphic or sedimentary). Both inorganic (chemical based) minerals and organic (organism based) matter can combine to form rock—such as the beautiful gem amber.



# COMPOSITION

Neutrons, electrons and protons combine to form atoms



Atoms combine to create molecules



Molecules combine to form the 118 chemical elements



Those 118 chemical elements combine to form minerals



Over 5000 minerals have been identified which can combine in different ways and quantities to form rock



# ROCK SIZE

Rock comes in all shapes and sizes, and is defined by its physical size. The smallest rock particles are clay and are too small to see with the naked eye. The largest rocks are called boulders and are anything larger than 256 mm.

<b>CLAY</b>	Minor particles up to 0.0039 mm	MUD
<b>VERY FINE SILT</b>	Particles from 0.0039 to 0.0078 mm	
<b>FINE SILT</b>	Particles from 0.00778 to 0.0156 mm	
<b>MEDIUM SILT</b>	Particles from 0.0156 to 0.0319 mm	
<b>COURSE SILT</b>	Particles from 0.0310 to 0.0625 mm	
<b>VERY FINE SAND</b>	Grains from 0.0625 to 0.125 mm	SAND
<b>FINE SAND</b>	Grains from 0.1254 to 0.25 mm	
<b>MEDIUM SAND</b>	Grains from 0.25 to 0.5 mm	
<b>COURSE SAND</b>	Grains from 0.5 to 1 mm	
<b>VERY COURSE SAND</b>	Grains from 1 to 2 mm	GRAVEL
<b>PEBBLE</b>	From 2 to 64 mm	
<b>COBBLE</b>	From 64 to 256 mm	
<b>BOULDER</b>	Anything above 256 mm	





# ROCK HARDNESS



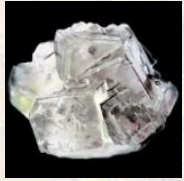
**1 TALC**



**2 GYPSUM**



**3 CALCITE**



**4 FLUORITE**



**5 APATITE**



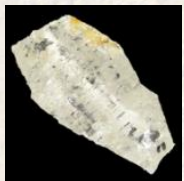
**6 FELDSPAR**



**7 QUARTZ**



**8 TOPAZ**



**9 CORUNDUM**



**10 DIAMOND**

## EASILY SCRATCHED WITH A FINGERNAIL

← Baby powder

← Lead, tin

{ Fingernail, gold, silver, aluminium

← Copper coin, brass, bronze

{ Paper clip, steel, platinum

← Human teeth

← Window glass

← Titanium

{ Hardened steel

← Light filament, Tungsten

{ Extra hard drill bits, Tungsten carbide

## IMPOSSIBLE TO SCRATCH WITH ANYTHING BUT ANOTHER DIAMOND





# IGNEOUS ROCKS

ROCKS THAT ARE FORMED UNDERGROUND





# IGNEOUS ROCK

## Description

Igneous rock is formed from the cooling and solidification of magma (molten rock found below the surface) or lava (molten rock found above the surface). Igneous is from the Latin word *ignis*, which means fire.

Igneous rocks tend to be white, cream, grey or black. External surface colours of exposed igneous rock may change, depending on weathering and location. Granite and basalt are the two most prevalent igneous rocks on the Earth's surface.

## Categories

Igneous rock is divided into two categories based on how it is formed:

Intrusive: Rock formed in the Earth by magma (also known as plutonic rock).

Extrusive: Rock formed on the surface from lava (also known as volcanic rock).

## Crystallization

Igneous rock contains mineral crystallization. Crystals take time to develop and their growth is influenced by factors including heat. The quicker crystals cool, the smaller they are and the stronger the resulting rock. Crystals are considered small if they are 1 mm or smaller, and large if they are bigger than 1 mm. If extrusive rock cools extremely quickly, it can form a glass-like appearance.

## Examples

Basalt, granite, rhyolite, obsidian, diorite, felsite and pumic.

## Granite

While granite is formed underground, we see it above ground in areas where deep erosion has occurred, exposing the rock.

## Basalt

Basalt is referred to by different names across Australia. For instance, in Victoria it is often called bluestone, which has been quarried since colonial days for use as paving and for buildings, etc. Early quarries included: Clifton Hill, Brunswick and Williamstown (where prisoners Ned Kelly and Harry Powell laboured). The Old Melbourne Goal and Pentridge Prison (where prisoners dug out their own bluestone from what is now Coburg Lake) are some examples.

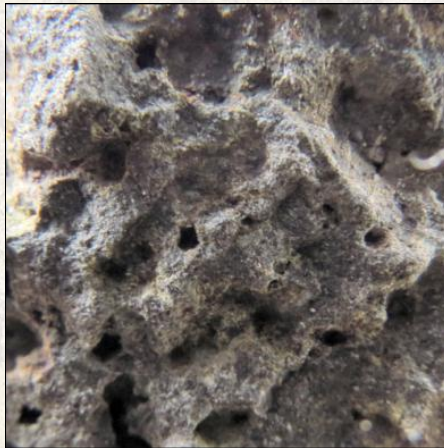
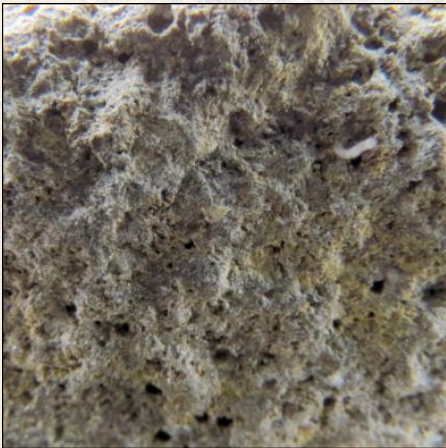


# IGNEOUS ROCK



## Basalt

Basalt is a dark grey to black rock which is rich in magnesium and iron. It is the most common type of extrusive igneous volcanic rock, formed from the rapid cooling of basaltic lava (lava containing basalt) exposed at or very near the surface of the Earth's crust. Over 90 percent of all volcanic rock is comprised of basalt.



Much of the rock brought back from the moon by astronauts was comprised mostly of basalt. Basalt has a low silica content, resulting in lava flows with a low viscosity which can travel fast across the Earth's surface. In 2021 scientists found a new basalt after drilling a kilometre into the pacific ocean's floor. It was chemically and mineralogically different to all other known basalts.

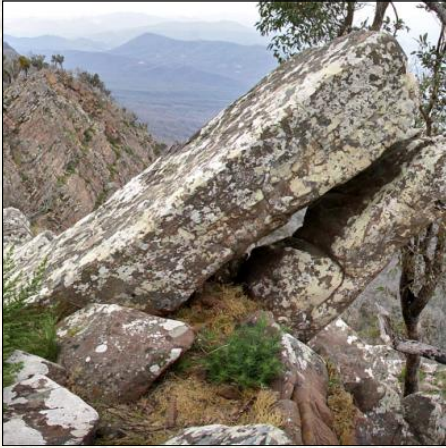


Basalt blister at Williamstown





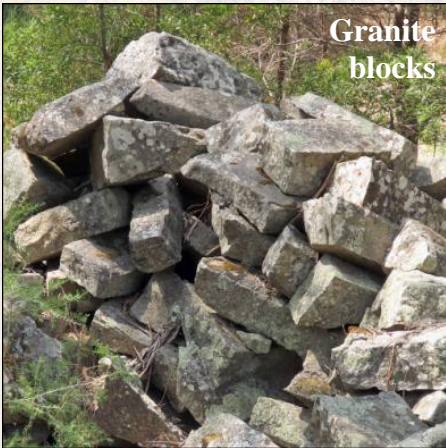
# IGNEOUS ROCK



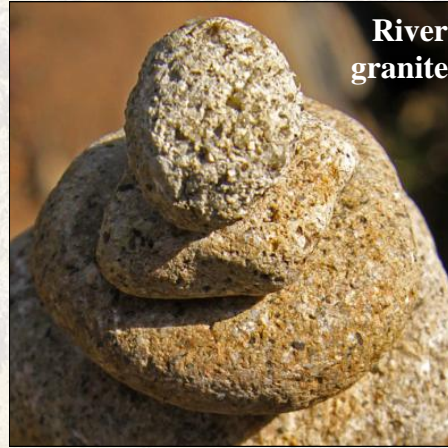
Old granite quarry

## Granite

Granite is a common type of intrusive, felsic, igneous rock, which is granular and phaneritic in texture. It contains at least 20 percent quartz by volume and is also rich in feldspar. It often has speckled colours which include black, grey, red, green and blue. If granite is visible on the surface, it is because it has been uplifted from within the crust, and the overlaying sedimentary layers have been eroded away.



Granite blocks



River granite

It is found throughout Australia and is often seen as large rocks. It is strong, able to bear heavy weight, resists weathering and can be polished and then used for kitchen benches or grave headstones. It can be used in buildings, bridges, monuments etc and even as crushed rock.





# IGNEOUS ROCK

Quartzite with visible crystals



Quartzite with visible crystals



## Quartzite

Quartzite is a silicate mineral which appears in numerous colours including milky-white, smokey brownish-grey, yellow and violet. It is the second most common mineral in the Earth's crust, behind feldspar. It is one of the most common rock-building minerals and rocks that contain quartzite can be igneous, metamorphic or sedimentary.

Smokey quartz



Lemon quartz



Quartzite is one of the hardest and most weather resistant mineral compounds on Earth. Most sand is comprised of quartz and crystals of quartzite in sand are usually opaque. An understanding of quartzite is important for gold mining due to the presence of gold near and within quartz outcrops.



Amethyst Quartz





# METAMORPHIC ROCKS

ROCKS SHAPED BY METAMORPHIC PROCESSES





# METAMORPHIC ROCK

## Description

Metamorphic rock is formed from the naturally occurring transformation of an existing sedimentary or igneous rock through a process called metamorphism. The word metamorphic is derived from Greek word *morphē* and means 'change in form'.

Metamorphic rock is formed when sedimentary or igneous rocks are:

1. Subjected to heat (without melting) from magma, which is generally hotter than 150 degrees Celsius.
2. Subjected to pressure from the moving of the Earth's crust, which generally exceeds 1500 bars.

A metamorphic rock's original state is called its protolith. For instance, the protolith of a slate is shale or mudstone.

Metamorphic rock can also be re-subjected to metamorphic processes. Metamorphic rock can be formed underground or on the Earth's surface. They are often found in mountainous regions. Some metamorphic rock can become foliated, which means the rock looks banded due to pressure aligning grains in the rock.

## Categories

Metamorphic rock is divided into two categories based on how it is formed:

Contact: Rock is close to magma or lava and becomes heated, changing its form.

Regional: Rock is subjected to pressure (and possibly heat), changing its form.

## Examples

Slate, marble, gneiss, serpentinite and granulite.

## Marble

Marble is one of the most recognisable metamorphic rock types, being used for things such as bench-tops, flooring, sculptures, and as a building material. The World Heritage listed Taj Mahal in India is completely clad in ivory-white marble. Both the Romans and the Greeks used marble extensively for structures because of its allure and elegance and the Leaning Tower of Pisa is made of marble, as is the Washington Monument in Washington DC. The floor of the Public Hall at the Australian High Court is covered in marble tiles and the floor and bench face in Courtroom 1 are marble.



# METAMORPHIC ROCK



## Slate

Slate is formed by metamorphism of fine-grained sediments or volcanic ash, which flows plastically when pressured. Like shale, it is identified by having thin parallel layers, which have a tendency to split along flat planes (fissility). Its composition includes quartzite, muscovite, biolite, chlorite, hematite and pyrite.



Slate roof tiles



Black slate floor tiles

It is darker in colour, tending from dark grey to black. But it is also found in purple, green and cyan. It should not be confused with shale, from which it may be formed. The name 'slate' is also given to a number of products like slate floor and roof tiles and blackboards. Dark grey to black



Black slate





# METAMORPHIC ROCK



## Greenstone

Greenstone is formed from weakly metamorphosed igneous rock such as basalt, and is usually found between granite and gneiss bodies of rock. The name greenstone refers to the bluish-greenish hue that generally results from minerals such as chlorite, actinolite and other green amphiboles.



Belts of greenstone are found around the world and vary from under a kilometre in length to over 1000 km. The 20+ known Victorian deposits include the Howqua River Valley, Mt William and the Warby Ranges near Wangaratta.

It was favoured by Aboriginals for knives and axe heads, due to its ability to be sharpened as tools.





# SEDIMENTARY ROCKS

ROCKS THAT ARE FORMED BY SEDIMENTS





# SEDIMENTARY ROCK

## Description

Sedimentary rock is formed by the depositing of materials at the Earth's surface or within bodies of water. It is formed when layers of different sized rock (mud, sand and gravel) are compressed and form new rock.

Sedimentary rock is usually formed in flat areas, however these flat areas may later be subject to movement and result in it being found on hills or mountains. Sedimentary rock can include minerals that are the result from biological materials, such as decaying plant and animal matter. The rock coal is formed from plant matter.

Sedimentary rock covers around 75 percent of rocks on the Earth's surface.

## Categories

Sedimentary rock is divided into three categories based on how it is formed:

Chemical: Rock containing minerals and produced by chemical precipitation.

Detrital: Rock which contains particles from pre-existing rocks.

Biogenic: Rock which contains biological matter.

## Examples

Shale, sandstone, limestone, coal, flint, claystone, chalk, siltstone, jaspilite.

## Fossils

These are generally the only rock type where fossils can be found. In extremely rare instances fossils have been found in metamorphic rock, however the heat and pressure of metamorphic rock usually destroys fossils.

## Sandstone

Sandstone is made up of particles of sand that have melded together. Like bluestone, sandstone has been used since the earliest days of Victoria for buildings. Melbourne Parliament House (first seat of federal government in Australia) was built of sandstone quarried from Heatherlie Quarry near Halls Gap, in the Grampians National Park. Sandstone buildings can be found across Victoria.

## Limestone

Formed from the skeletal remains of living organisms, it accounts for around ten percent of sedimentary rocks in the world. It was also been used for buildings.



# SEDIMENTARY ROCK



## Shale

Shale is the most common of all sedimentary rocks on the planet and is formed primarily from feldspar, the most common mineral found on or near the surface of the Earth. It is fine grained, primarily formed from clay and mud sized rock particles and may appear as a grey, dull-orange or yellowish.

Shale is identified by its thin parallel layers that are usually less than one cm in width and have a tendency to split along flat planes (known as fissility). Shales slowly form from sedimentary deposits usually deposited in slow moving waters such as lakes, deltas and floodplains.



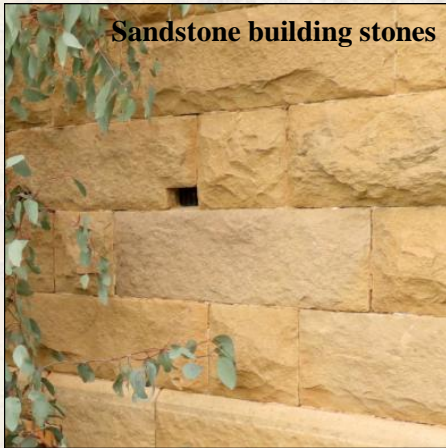


# SEDIMENTARY ROCK

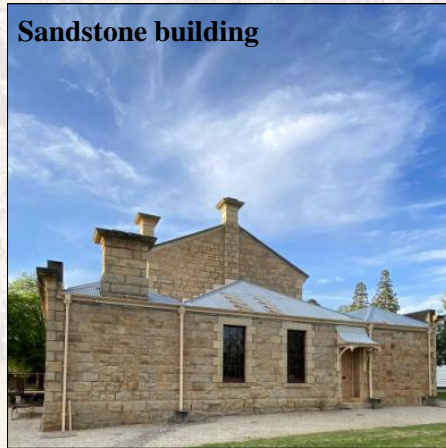


## Sandstone

Sandstone is formed from minerals such as feldspar, the most common mineral found on or near the surface of the Earth. Sandstone is composed of sand-sized rock grains and minerals that have become cemented together over time by the pressure of layers of rock above.



Sandstone building stones



Sandstone building

Highly metamorphosed sandstone (subjected to heat and pressure) is harder and is more resistant to weathering by natural elements. This sandstone has been used for building structures, paving and roofing across the world from before the first records were kept. Sandstone was also used by early Aboriginals in shaping wood tools and weapons.



Sandstone cliffs





# SEDIMENTARY ROCK



Limestone sinkhole

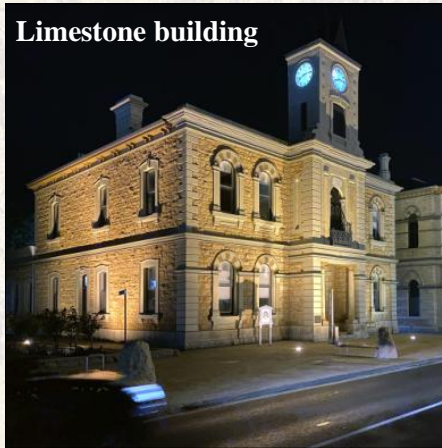


## Limestone

Limestone is formed from minerals such as calcite and aragonite, which are both different crystal forms of calcium carbonate. Around 20 percent of sedimentary rock is carbonate rock. Limestone is formed when it precipitates from water containing calcium. Another common rock known as dolomite is formed when limestone is impregnated with the mineral magnesium.



Limestone building



Most limestone was formed in shallow marine environments and is known for supporting the formation of caves and sinkholes. The Limestone Coast in SA has nearly a thousand recorded caves and sinkholes. Many, such as the World Heritage Naracoorte Caves, contain important fossil records.



Limestone cave





# CHEMICAL ELEMENTS

EXAMPLES OF CHEMICAL ELEMENTS IN ROCK FORM



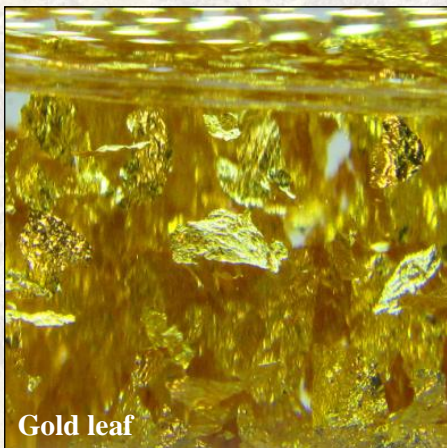
# CHEMICAL ELEMENT



## Gold

**Symbol:** Au  
**Atomic No:** 79

A dense soft malleable mineral that is where we get the colour gold from. It is admired and valued due to its brightness, shiny disposition, resistance to tarnishing and rarity. Many Victorian towns and rural cities were established during the gold rushes of the 1850s and 1860s.



Gold leaf

Trace amounts of gold are found in almost all areas, but extracting it in payable amounts is an ongoing challenge. In nature gold is found in veins, as nuggets, or as grains. It can be found on or just below the surface and in alluvial deposits such as in river and creek beds.





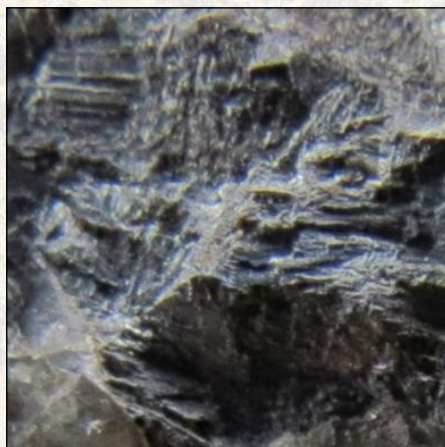
# CHEMICAL ELEMENT



## Antimony

**Symbol:** Z  
**Atomic No:** 51

A rare chemical element which contains arsenic, as well as traces of silver, iron and sulphur. In some cases antimony and arsenic are hard to tell apart, with a chemical analysis being required. It is usually coloured tin-white to grey with a bluish tinge.



Antimony should not be touched with bare hands due to the presence of the arsenic. During extraction the dust must not be breathed for the same reason. In times past, antimony was mined at numerous locations across Central Victoria, including at a substantial mine near Marysville known as Wilks Mine.







# LOCAL FOSSILS

FOSSILS FOUND IN LOCAL ROCK



# FOSSIL PERIODS

## Sixth Period: Permian

Plants and animals  
living on continents

**Mammal-like reptiles, amphibians,  
Glossopteris trees and leaves,  
Xenacanth sharks, Rugose corals,  
Trilobites, Goniatite cephalopod**

## Fifth Period: Carboniferous

Invertebrates and  
carboniferous forests

**Early reptiles, Pholidogaster,  
freshwater shark, Palaeoniscid fish,  
King crab, Giant scorpion,  
Meganeura**

## Fourth Period: Devonian

Plants and animals

**Giant and spiny trilobites, early land  
plants, corals, mosses, jawless fish,  
armoured jawed fish, stem-tetrapod,  
lobe-finned fish**

## Third Period: Silurian

Sea coral reefs, jawless fish and  
eurypterids in our lakes and rivers

**Jawless fish (Jamoytius, Dartmuthia  
and Drepanaspis), Chericerate  
Arthropods, Trolibites, Corals**

## Second Period: Ordovician

This period supported great  
numbers of marine life

**Grapholites, Brachiopods, Trolibites,  
Jawless fish (Arandaspis and  
Astraspis), Cephelopod Mollusc**

## First Period: Cambrian

First fossils to develop skeletons  
and shells

**Pikaia, Anomalocaris, trolibite,  
Brachiopod, vauxia, Hallucigenia,  
Priapulid, Hallocigenia, Polychaete**



# LOCAL FOSSILS



## MONOGRAPTUS

A genus of extinct graptolites. It is the final stage of the graptoloid evolution before it became extinct in the early Devonian Period. This fossil series was found near Alexandra in a layer that was exposed by Earth works.



## TETRAGRAPTUS

A genus of extinct graptolites. It is the final stage of the graptoloid evolution before it became extinct in the Middle Ordovician Period. This fossil series is located along the big river and the layer holding these fossils is exposed over a large area.



## CRINIOD

Crinoids (sea lilies) are small ocean animals similar to starfish, sea urchins and brittle stars (all of which are echinoderms). The fossils (left) are of the stem of the animal. They carpet the ocean floor and sway with the currents. The longest crinoid stem ever found measured 40 m in length.



## CRINIOD

Crinoids (sea lilies) are small ocean animals similar to starfish, sea urchins and brittle stars (all of which are echinoderms). The fossils (left) are of the stem of the animal. They carpet the ocean floor and sway with the currents. The longest crinoid stem ever found measured 40 m in length.





# LOCAL FOSSILS



Courtesy Ron Turner



Courtesy Ron Turner

## CRINIOD

Crinoids (sea lilies) are small ocean animals similar to starfish, sea urchins and brittle stars (all of which are echinoderms). The fossils (left) are of the stem of the animal. They carpet the ocean floor and sway with the currents. The longest crinoid stem ever found measured 40 m in length.



## SHELL

Fossilised sea shells are the home of early molluscs. This sea shell fossil series was found near Alexandra in a layer that was exposed over a large area and which is exposed in numerous adjoining areas.



## DICELLOGRAPTUS

This fossil was found near Enochs Point in a layer that was exposed over a large area by roadside works. Little is currently known about this fossil type.



## DICRANOGRAPTUS HAINS

This fossil was found near Enochs Point in a layer that was exposed over a large area by roadside works. Little is currently known about this fossil type.





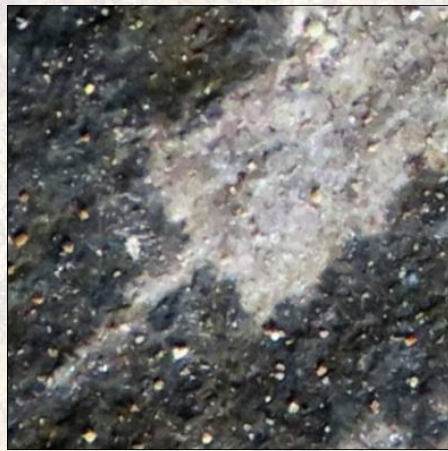
# LOCAL FOSSILS



## **EUCLIMACOGRAPTUS HASTATUS**



This fossil was found near Enochs Point in a layer that was exposed over a large area by roadside works. Little is currently known about this fossil type.



## **CLIMACOGRAPTUS**



This fossil was found near Enochs Point in a layer that was exposed over a large area by roadside works. Little is currently known about this fossil type.



## **ORTHOGRAPTUS QUADRIMUCRONATUS**



This fossil was found near Enochs Point in a layer that was exposed over a large area by roadside works. Little is currently known about this fossil type.

Do you have any samples of fossils that are local to Central Victoria that we could photograph and add to this collection?



# GEMS

## SOME ROCKS YOU MAY SEE AS GEMSTONES

Gemstones are minerals that are beautiful and often desirable because of their rarity. There are only around 130 minerals that are considered worthy of being a gemstone, and of these, only around 50 are commonly bought and sold.



# GEMSTONES



## **AGATE**

Also known as:

Rock type: Igneous and metamorphic

Comprised primarily of cryptocrystalline silica and usually chalcedony. It is found in a variety of colours and translucent. It usually found in igneous rock, but will form in metamorphic rock when silica is deposited from groundwater into the cavities of igneous rock over time.



## **AGATE** (Blue Lace Agate)

Also known as:

Rock type: Igneous and metamorphic

Comprised primarily of cryptocrystalline silica and usually chalcedony. Blue lace agate exhibits a lace-like pattern with forms such as eyes, swirls, bands or zigzags. It is found in a variety of colours and translucent.



## **AGATE** (Turritella)

Also known as: Torriitella agate, Brown agate

Rock type:

Found in the Green River formation of Wyoming, it is easily recognised due to its small to medium sized fossilised snails which are prominent because of the lighter colours of their outer turritella shell which contrasts highly against the darker brown agate.



## **AGATE (TREE)**

Also known as:

Rock type:

Comprised primarily of cryptocrystalline silica and usually chalcedony. It is found in a variety of colours and translucent. While it doesn't have the normal agate banding, it is still an agate. Its is named because of the tree-like or fern-like formations which develop within it.



# G E M S T O N E S



**AQUAMARINE** (Often heat treated to make it blue)

Also known as:

Rock type: Igneous

Along with emerald, it is the greenish-blue to blue variety of Beryl. It can form in stunning flawless crystals resulting in some of the more spectacular mineral crystals. They can be heated to produce a sky-like colour. Many sold today have been heat-treated.



**ANGELITE**

Also known as: Anhydrite

Rock type: Sedimentary

The name is a reflection of the angelic light blue colour. It is a semi-transparent fine grained sedimentary rock which is the result of a dewatering of the rock forming mineral gypsum. Large deposits of this popular gem are found in Peru.



**BLOODSTONE**

Also known as: Heliotrope, stone of Babylon

Rock type: Igneous

A dark green to bluish-green mixture of quartz that usually appears as jasper (when opaque) or chalcedony (when translucent). It has small spots of red, which are blood-like in colour. The red spotting may more rarely appear as stripes or veins.



**BLOODSTONE** (Dragon)

Also known as: Dragon Bloodstone

Rock type: Igneous

A dark green to bluish-green mixture of quartz that usually appears as jasper (when opaque) or chalcedony (when translucent). It usually has small spots of red, which are blood-like in colour and olive green to bright green colours.



# GEMSTONES



## BRONZITE

Also known as:  
Rock type: Igneous

A dark brown to greenish rock that is often cut and polished for use as a gemstone. It usually contains impurities which cause variation and often appears with a fibrous structure. When more fibrous, the stone may appear similar to a cats-eye gem.



## CALCITE

Also known as:  
Rock type: Found in all three rock types

A common ubiquitous mineral found in large quantities in America, Mexico, Slovakia, Peru, Iceland, Romania and Brazil. It is a principal mineral found in limestone and marble. It is easily burn off when subjected to acid, leaving calcium carbonate and impurities behind.



## CITRINE

Also known as: flourspar  
Rock type: Igneous

A rare variety of quartz whose colour ranges from pale yellow to brown due to ferric impurities. Most commercial citrines are heat-treated amethyst with small lines in the crystal as opposed to a natural citrine's cloudy or smokey appearance.



## CHRYSANTHEMUM

Also known as: Flower stone  
Rock type:

A gemstone that can have a distinct pattern, which resembles a chrysanthemum flower. The flower is usually milky white to grey and the rock a dark grey to black colour. The formation of the flower pattern is considered rare. Mostly the rock is like the one left.



# G E M S T O N E S

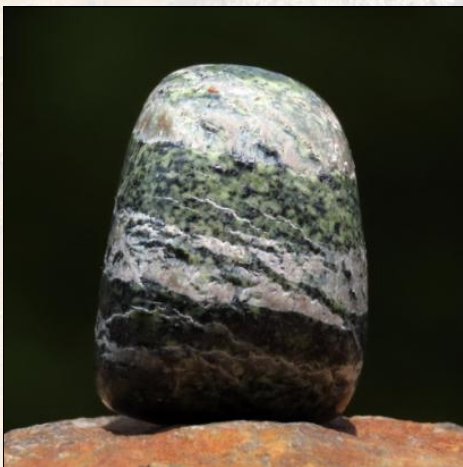


## **CHRYSOPRASE**

Also known as: Prase

Rock type: Igneous

A gemstone variety of chalcedony, which usually has a distinctive apple-green colour, but some specimens do have darker green colours (often referred to as prase). Its colour is due to small quantities of nickel. Darker varieties of chrysoprase are known as prase.



## **CHRYSOTILE**

Also known as:

Rock type: Igneous

A member of the serpentine group that is the most common form of asbestos in the world. It accounts for 95% of asbestos in the USA alone. The variation and intensity of the tint depends on the percentage of iron in the crystal structure.



## **EMERALD**

Also known as: Beryl

Rock type: Found in all three rock types

A green variety of mineral beryl, which is highly prized and valuable. Its intense green colour has made it a sought-after gemstone throughout history. The earlier source of emerald was from Egypt, but better quality emerald is sourced today from mines in Colombia.



## **FELDSPAR**

Also known as:

Rock type: Igneous

Feldspars are a group of rock-forming aluminium silicates that together make up just over 40 percent of the Earth's surface (by weight). Feldspar is a term that has its origins in rock being found in fields and that those rocks were of a non-metallic origin.



# G E M S T O N E S



## **FLOURITE**

Also known as: Flourspar

Rock type:

The common mineral form of calcium fluoride, it is a gem found in Norway, England and America. It can have multiple colours in one rock and colours can include violet, blue, yellow, pink, green and clear. Large clear gemstones are also common.



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## **GARNET**

Also known as:

Rock type: Igneous

A group of closely related silicate minerals that have been used since the Bronze Age as gemstones and abrasives (a material used to rub against other materials to form a finish. Transparent and translucent garnets (especially red) are used in jewellery.



## **GOLDSTONE SANDSTONE**

Also known as: Gold sandstone, aventurnine, stellaria

Rock Type: Mad made

A man-made rock also sometimes called aventurnine glass or stellaria. Its name is derived from the Italian name for adventure or chance (*avventurina*). Synthetic goldstone was made from the 1600s when the Miotti family of Venice invented and licensed the process.



# G E M S T O N E S



## HEMATITE

Also known as: Haematite

Rock type: Igneous

Hematite is a gemstone form of iron oxide—the principal ore in iron that is widespread in rocks and soils. Hematite forms in a crystal shape, is very dense and has a refractive index that is higher than diamond. When polished it can appear like polished silver.



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## HOWLITE

Also known as: turquenite

Rock type: Igneous

The natural form (not artificially coloured) of Howlite. It was discovered near Windsor, Nova Scotia in 1868 by Canadian chemist Henry How. Because of its porous nature, it can be coloured to imitate other miners such as turquoise.



## HOWLITE (dyed)

Also known as: turquenite

Rock Type: Artificial

An artificially coloured and polished rock, which is sold as howlite of turquenite. Howlite was discovered near Windsor, Nova Scotia in 1868 by Canadian chemist Henry How. Because of its porous nature, it can be coloured to imitate other miners such as turquoise.



# G E M S T O N E S



## **JADE**

Also known as: Jade

Rock type: Metamorphic

Jade is an ornamental green mineral, which has featured prominently in ancient art and jewellery and has been traded widely since its discovery. Jade is the name given to the mineral nephrite or jadeite. This specific stone (left) is also known as Canadian Jade.



## **JASPER**

Also known as: Flint, Chert

Rock type: Igneous

An opaque impure variety of silica, usually red, yellow, brown or green. It is one of many varieties of quartz based gemstone available. The name jasper is derived from the French word for spotted or speckled stone (*jaspe*). It is almost always multicoloured.



## **JASPER (Chocolate)**

Also known as: Brown jasper

Rock type: Igneous

An opaque impure variety of silica that is brownish in colour. It is one of many varieties of quartz based gemstone available. The name jasper is derived from the French word for spotted or speckled stone (*jaspe*). It is almost always multicoloured.



## **JASPER (Dalmatian)**

Also known as: Spotted jasper

Rock type: Igneous

An opaque impure variety of silica, usually cream to white with black spots or blotches. It is one of many varieties of quartz based gemstone available. The name jasper is derived from the French word for spotted or speckled stone (*jaspe*).



# GEMSTONES



## **JASPER** (Kambaba)

Also known as: Kambaba jasper, Crocodile jasper

Rock type: Igneous

A stone incorrectly described as having layers of fossilised single cell stromatolite algae. It is actually an extrusive volcanic rock with a high silica content found in the west-central region of Madagascar. It is found in bluish, grey or green colours with distinct greenish orbs.



## **JASPER** (Leopard skin)

Also known as: Leopard spot jasper

Rock type: Igneous

An opaque impure variety of silica that is usually brownish in colour. It is one of many varieties of quartz based gemstone available. The name jasper is derived from the French word for spotted or speckled stone (*jaspe*). It is almost always multicoloured.

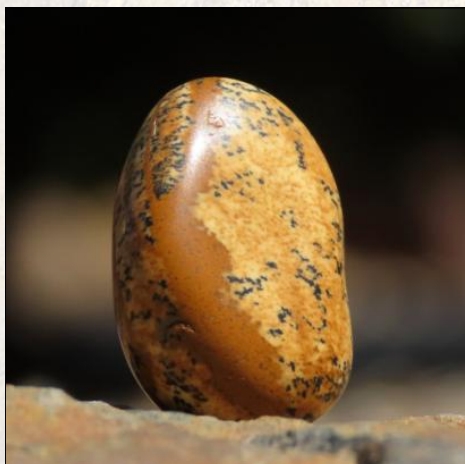


## **JASPER** (Orbicular)

Also known as: Ocean Jasper, Poppy Jasper

Rock type: Igneous

An opaque impure variety of silica found around Madagascar. It is usually defined by its variably coloured spherical orbs. The name jasper is derived from the French word for spotted or speckled stone (*jaspe*). It is almost always multicoloured.



## **JASPER** (Picture)

Also known as: Picture Jasper

Rock type:

A brown form of jasper known for its picture-like formations. It is one of many varieties of quartz based gemstone available. The name jasper is derived from the French word for spotted or speckled stone (*jaspe*). It is almost always multicoloured.



# G E M S T O N E S



## **JASPER** (Zebra)

Also known as:

Rock type: Igneous

An opaque impure variety of silica, usually white with black areas and lines. It is one of many varieties of quartz based gemstone available. The name jasper is derived from the French word for spotted or speckled stone (*jaspe*).



## **KYANITE**

Also known as:

Rock type: Metamorphic, sedimentary

A gemstone rich in aluminium and found primarily in Switzerland, Brazil, Myanmar and the US. It is commonly used ceramics and abrasives. It gets its name from the Greek word 'kuanos', meaning deep blue, but is also found in grey, green, yellow and white.



## **LEPIDOLITE**

Also known as:

Rock type: Igneous

An uncommon member of the mica group of minerals, it is one of the richest sources of lithium. It is usually a lilac-grey to rose coloured rock. It forms in granite masses that contain high amounts of lithium. It is often confused with muscovite, a similar mica based mineral.



## **LAPIS LAZULI**

Also known as:

Rock type: Metamorphic

A deep blue rock used from antiquity in jewellery as a semi-precious stone because of its intense colour. It is found primarily in Afghanistan and Siberia, though is also found in Pakistan, Mongolia, Italy, Canada and the USA and is comprised mainly of hauynite and solalite.



# G E M S T O N E S



## **MAGNESITE**

Also known as: Magasite

Rock type: Igneous

A gemstone with a high content of magnesium carbonate, iron, manganese, cobalt and nickel. As a gem it is usually white, but may be grey, brown, yellow and pink, depending on minerals balance. The more magnesite, the more yellow and brown it becomes.

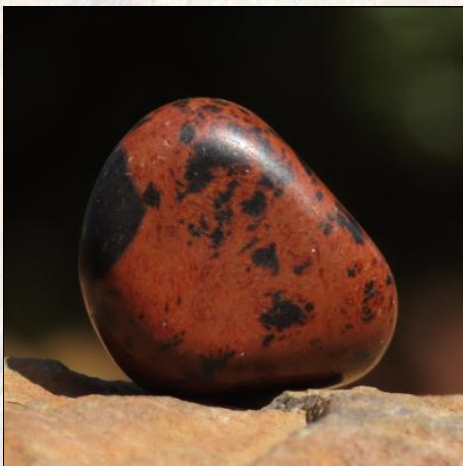


## **MOOKAITE**

Also known as: Mookaite Jasper, Australian Jasper

Rock type: Igneous

A variety of chalcedony found near Mooka Creek in the Kennedy Ranges, Western Australia. The rock is named after the area it is found. The Aboriginal term *Mooka* means 'running water'. The term is a locally coined name for silicified porcelanite.

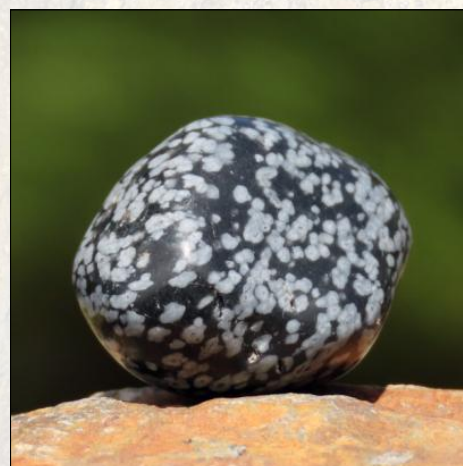


## **OBSIDIAN** (Mahogany)

Also known as: Mahogany obsidian

Rock type: Igneous

Obsidian is a naturally occurring volcanic glass formed in extrusive igneous rock where cooling has occurred rapidly. It is high in silica, the natural form of glass. Unlike more pure and transparent obsidian, mahogany obsidian contains more impurities, including hematite.



## **OBSIDIAN** (Snowflake)

Also known as: Snowflake obsidian

Rock type: Igneous

A volcanic glass formed as an extrusive volcanic rock. Snowflake obsidian has a distinct snowflake or blotchy look due to the inclusion of cristobalite crystals, a polymorph (able to exist in more than one solid form) of silica that is formed at very high temperatures.



# G E M S T O N E S



## **OPALITE** (Natural)

Also known as: Common opal

Rock type: Sedimentary

Opalite can mean many things, including the name of an imitation opal (below). However it is firstly the name given to an impure form of common opal, a natural gem that shares the same chemical properties as opal. Australia is an important source of opalite.



## **OPALITE** (Man-made)

Also known as: Moonstone, Argenon, Sea opal

Rock type: Man-made

A man-made decorative opalescent (opal-like) glass. Natural opalite (common opal) shares the chemical properties as opal, but cheap synthetic opalite is beautiful, and even bluish when placed against a black background. Being glass, it can contain air bubbles.



## **PREHNITE**

Also known as:

Rock type: Metamorphic

Usually occurs as rounded or bubbly crystal masses, often with odd shaped epimorphs (hollow shell left by a dissolved mineral). It may have a brown ferrous coating, which is able to be removed using chemicals. It can be colourless, or grey to yellow with a green tinge.



## **PYRITE**

Also known as: Iron Pyrite and Fool's Gold

Rock type: Igneous

A rock form of iron sulphide and the most common of the sulphide minerals. It ranges in colour from silvery-yellow to golden metallic and is usually very reflective. It is common in both smaller crystals as well as larger crystals such as the one pictured.



# G E M S T O N E S



## **QUARTZ** (Clear)

Also known as: Peridot

Rock type: Igneous

A clear version of quartz crystal. It is reasonably common, which diminishes its value. It is found world-wide and occurs in large rocks, which means large gems can be cut from it.



## **QUARTZ** (Rose)

Also known as:

Rock type: Igneous

A rose-pink version of quartz crystal. It is often hazy or turbid (thick with suspended matter) that alters its colour. It is reasonably common, which diminishes its value. It is found world-wide and occurs in large rocks, which means large gems can be cut from it.



## **QUARTZ** (Lemon)

Also known as: Lemon Quartz

Rock type: Igneous

A yellowish and translucent version of quartz crystal. It can be almost opaque to nearly completely transparent. The transparency is the result of natural irradiation that acts to create free silicon within the crystal. It is a very popular form of quartz crystal.



## **QUARTZ** (Smokey)

Also known as: Smokey Quartz

Rock type: Igneous

A grey and translucent version of quartz crystal. It can be almost opaque to nearly completely transparent. The transparency is the result of natural irradiation that acts to create free silicon within the crystal. It is a very popular form of quartz crystal.



# G E M S T O N E S



## **RHODONITE**

Also known as:

Rock type:

A gem that is popular with collectors because of its pinkish-red colours. The red variant can be almost as red as a ruby. It often contains black manganese oxide veins which can run through it in a crisscross pattern. It is popular for carving as beads and cabochons.



## **RHYOLITE**

Also known as: Rainforest Opal

Rock type: Igneous

A felsic extrusive igneous rock rich in feldspar and quartz that has been described as the equivalent of the intrusive rock granite. It is referred to as Rainforest Opal due to its colours and patterns. This specimen was sourced from Mount Hay in Queensland, Australia.



## **SELENITE**

Also known as: Satin spar, desert rose, gypsum flower

Rock type: Igneous, sedimentary

A gemstone composed of calcium sulphate dihydrate, which means it has two molecules of water. It is a transparent and colourless variety of gypsum and is porous and easily dyed. It is found in large beds of sedimentary rock, especially limestone.



## **SODALITE**

Also known as: Hackmanite

Rock type: Igneous

A popular ornamental gemstone with a rich royal blue colour. First discovered by Europeans in 1811 in Greenland, it became popular after a Canadian find in 1891. A less common form (hackmanite) has minerals that will slowly change colour when exposed to light.



# GEMSTONES



## **TIGER'S-EYE**

Also known as: Tiger Eye or Hawk's-Eye

Rock type: Metamorphic

A gemstone with a golden to red-brown colour and a silky lustre. It is comprised mainly of red jasper and black hematite. It is mainly found in South Africa and Western Australia and is mainly composed of silicon dioxide. It is coloured by the presence of iron oxide.



## **TOURMALINE**

Also known as:

Rock type: Igneous

A semi-precious mineral and highly coloured stone, which comes in a wide variety of colours. It was used by scientists in the past to polarise light. Today it is one of the world's most common gemstones due to it forming in a variety of colours and structures.



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## **TURQUOISE**

Also known as: Turkish stone

Rock type: Igneous

Once a highly regarded ancient gem in Persia and Native American civilisations. The name is derived from the French name for Turkey (*turquoise*) and it is the only gem to have a colour named after it. The presence of copper in the gem produces its turquoise-blue colour.



# GEMSTONES



## UNAKITE

Also known as:

Rock type: Igneous

First discovered in North Carolina's Unakas Mountains, the gemstone has adopted the name of this location. It is often considered a lesser gem and is often used in jewellery as beads or displayed as basic cabochons because of its patterns and structure.

[CLICK ON IMAGE FOR MORE](#)





# ROCK FORMATIONS

ROCK FORMATIONS FROM AROUND THE WORLD



# A k r o s e M o n o l i t h

Once a huge sea, a coarse grained sedimentary sandstone formed that was hardened by pressure to form the rock akrose. In this photo softer areas have eroded unevenly, leaving this rock. It is coloured by the iron in the akrose rusting. This is the largest monolith rock in the world.



Courtesy: Holder Link

ULURU, KATA TJUTA NATIONAL PARK, NORTHERN TERRITORY



# Twelve Apostles



Formed by wind and water erosion from the Southern Ocean, the Twelve Apostles and surrounding coastline is limestone-rich. As different sections erode at different speeds, natural caves and formations have developed over time.



# Limestone Tubes

Once thought to be the remains of a petrified forest, these hollow tubes of limestone are likely the remains of Moonah tree trunks that became encased in limestone. Then as the soil eroded away these tubes were left exposed.





# Tessellated Pavement

Formed in basalt, there are both a loaf and pan style formations. In the pan formation, the middle of the rock erodes quicker than the joins. In the loaf formations the joint erode quicker than the main rock surface.





# Columnar Basalt



Formed of basalt, this formation of hexagonal columns is attributed to lava being partially insulated during its cooling phase, resulting in long columns of basalt. Today the columns rise to a height of 20 metres.



# Columnar Basalt Ends



Formed of basalt, this formation of hexagonal columns is attributed to lava being partially insulated during its cooling phase, resulting in long columns of basalt. Here the ends of the basalt columns can be seen.



# Rosette Rock



Formed in basalt upstream from the Organ Pipes, the rock has formed in an unusual and rare radial array. It is believed that the cooling of a pocket of lava cooling in a spherical cave, likely formed from an earlier lava flow.



# Basalt Blister



Western Victoria was once the site of massive lava flows. This three metre basalt blister at Williamstown was the result of a large bubble formed in hot magma that was cooling near the surface. Erosion has since removed the surface and the top of the bubble leaving this rock feature exposed. Basalt blisters are very rare geological feature and this one has fascinated geologists around the world. The Western Victorian basalt plains form the third largest lava plains in the world, covering ten percent of the state of Victoria.



# The Pinnacles



Columnar joining found in granite at The Pinnacles, Cape Woolamai Surf Beach. This is where sets of intersecting fractures (joins) result in the formation of a regular array of columns.



# The Colonnades



Columnar joining found in granite along the extension to the Cape Woolamai Surf Beach. This is where sets of intersecting fractures (joins) result in the formation of a regular array of columns.



# Anticlinal Fold

The Castlemaine anticlinal fold uncovered in 1874, shows a well formed fold. Saddle reefs such as this can occur in folds of sandstone and slate on lower geological horizons.





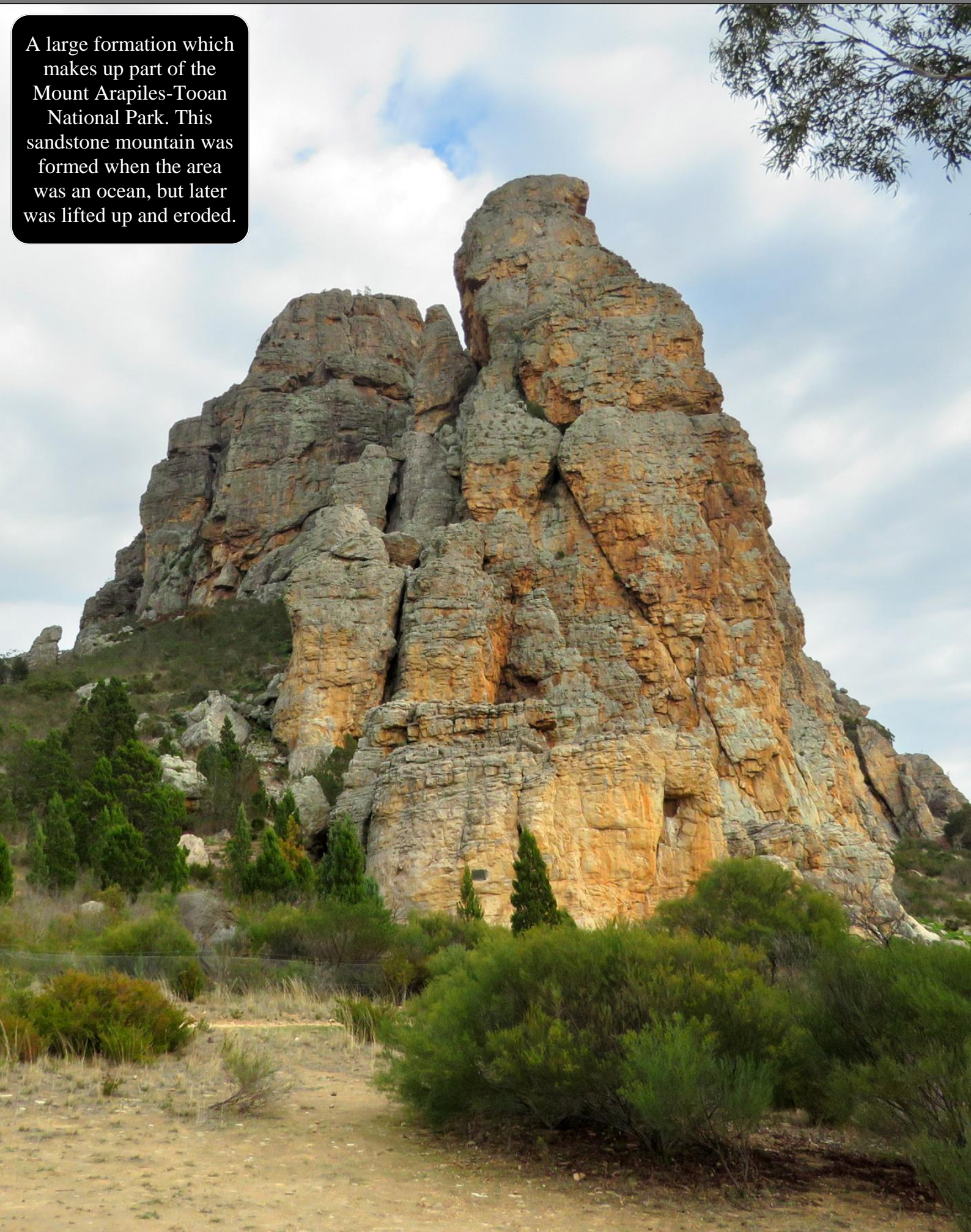
# Anticlinal Fold





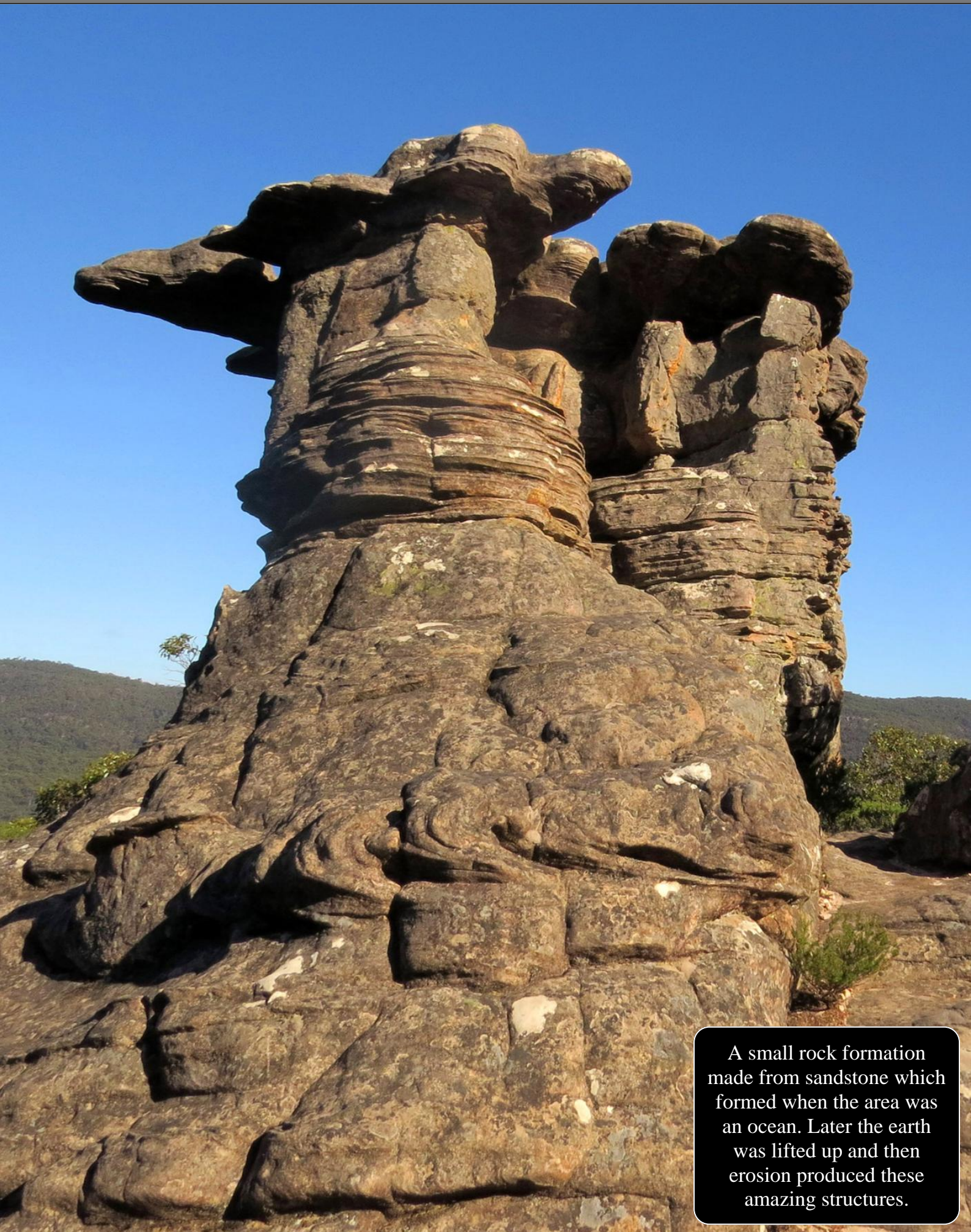
# Sandstone Mountain

A large formation which makes up part of the Mount Arapiles-Tooan National Park. This sandstone mountain was formed when the area was an ocean, but later was lifted up and eroded.





# Sandstone Monuments

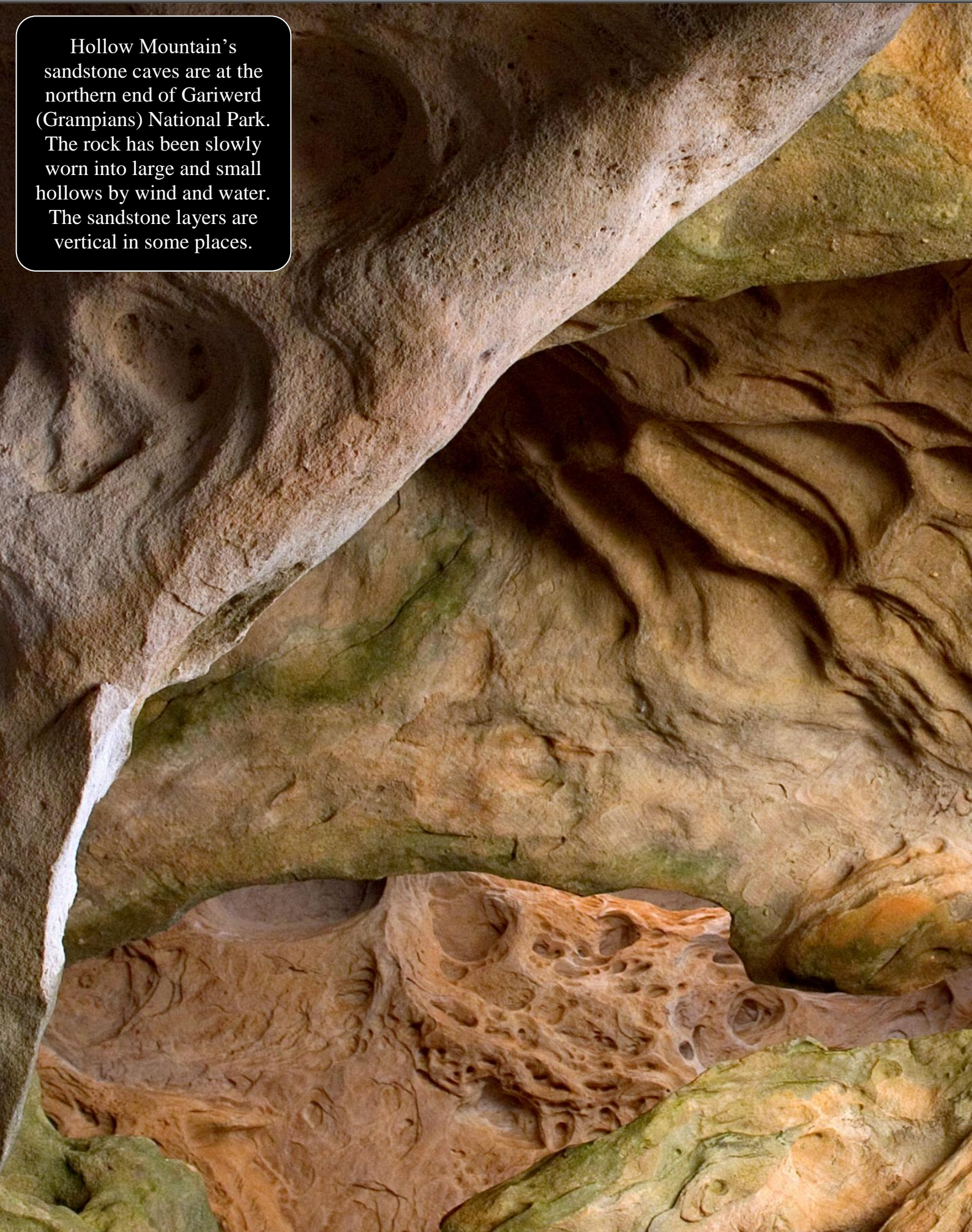


A small rock formation made from sandstone which formed when the area was an ocean. Later the earth was lifted up and then erosion produced these amazing structures.



# Sandstone Caves

Hollow Mountain's sandstone caves are at the northern end of Gariwerd (Grampians) National Park. The rock has been slowly worn into large and small hollows by wind and water. The sandstone layers are vertical in some places.





# River Rock on Bedrock

This river rock sitting upon bedrock has been lifted due to geological movement and exposed by a road cutting. Heavy grains of gold will drop through river rock and come to rest on bedrock.

River rock

Gold may have settled onto the top of this bedrock while this geological area was the bottom of a river. Evidence of modern gold fossicking can be seen here now that the river bed has been lifted and made visible in a local road cutting.

Red rock



# D y k e

A dyke is a sheet of rock or matter that is formed in a fracture in existing rock. They can be magmatic or sedimentary and are usually seen to cut across pre-existing lines of rock.





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# QUARRIES

EXAMPLES OF QUARRIES



# Eildon Dam Wall Quarry

Eildon is home to Mount Sugarloaf, which was developed as a quarry. Rock was removed from the southern side of the mountain and was used as ballast for the Eildon Dam Wall. The rock type was less important, as large heavy rocks were what was required for the 1 km long wall.





# Euroa Quarry at Gooram



The Euroa Quarry is located at Gooram on the Euroa-Mansfield Road. The quarry is a former hill, which has now been almost removed by the quarrying. The cliff seen in this image is a cross-section of the hill. Click for a Google satellite view of the site.



# Bulls Lane Quarry



BULLS LANE, TAGGERTY



# King & Latta Quarry

Quarries such as this roadside quarry have been used for many decades as a source for small crushed rock for road surfaces. This operated in the mid 1900s and had a small crushing machine on site.





# Trawool Granite Quarry

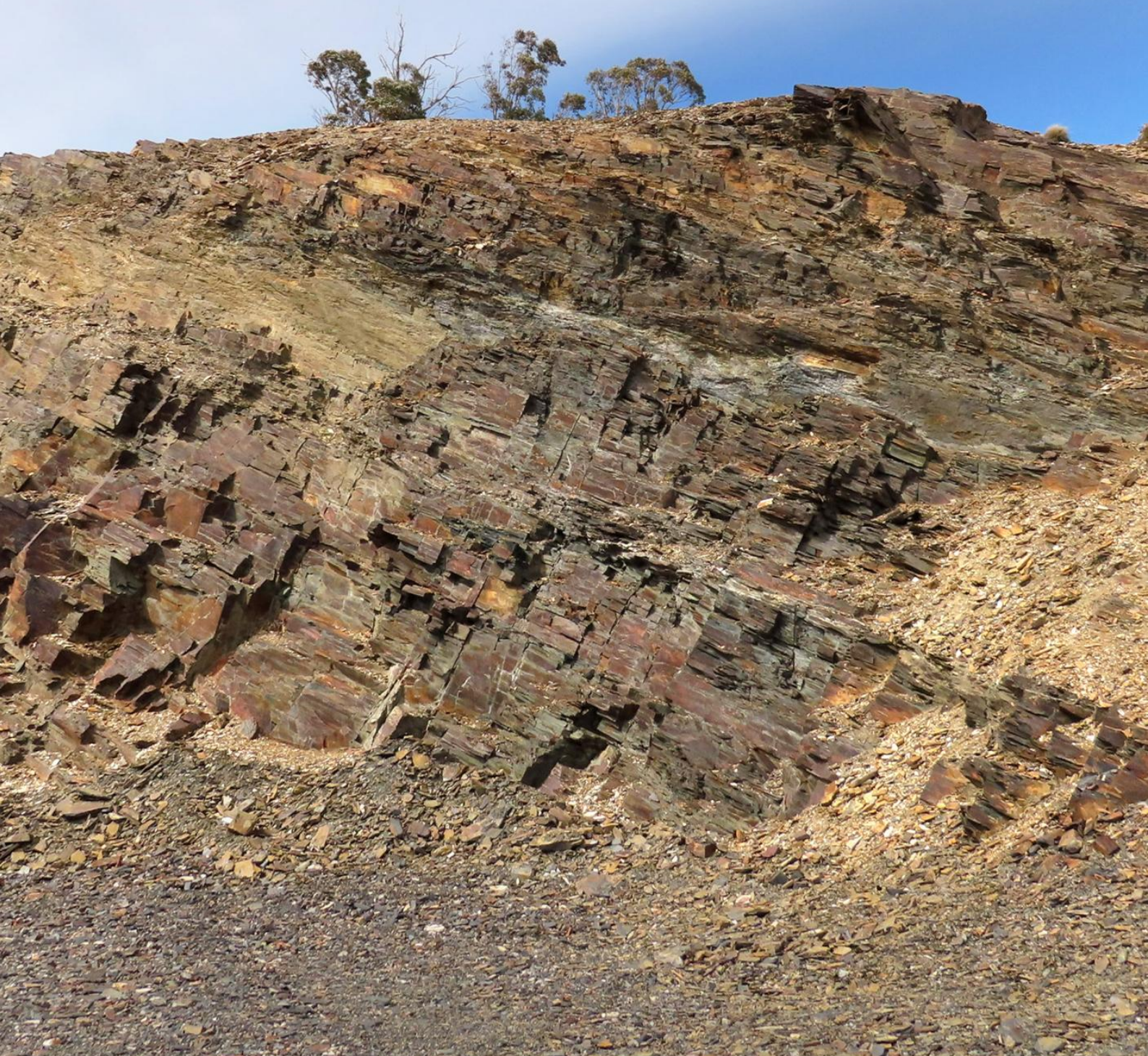
This quarry operated in the late 1800s and was the source of porphyry (granite) used for the construction of the nearby Seymour Reservoir, and transported to Melbourne for use in buildings and for monuments.





# Black Slate Quarry

This large quarry site operated in the mid 1900s and was where black slate was removed for many decades and sold locally and further afield. Black slate is highly prized, being more rare than normal slate.





# Mt Black Granite Quarry



This quarry operated in the late 1800s and was the source of granite used for the construction of the nearby Goulburn Weir.

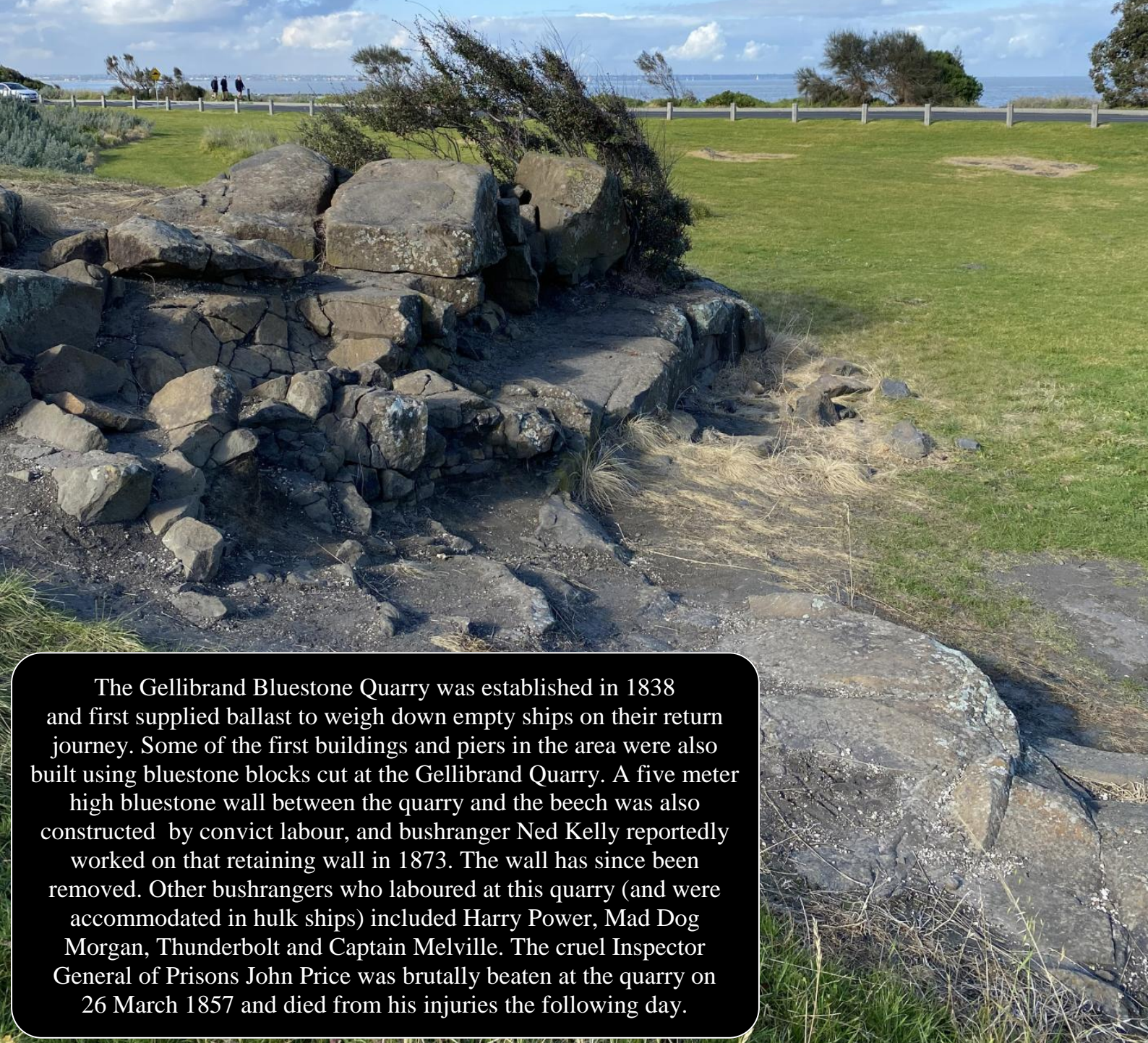
Large blocks were transported by horse and cart to the site. Some blocks which fell in transit were left where they fell.



# Gellibrand Quarry



Attack on John Price.  
Artist: L.A.E. (Bill) Sands.



The Gellibrand Bluestone Quarry was established in 1838 and first supplied ballast to weigh down empty ships on their return journey. Some of the first buildings and piers in the area were also built using bluestone blocks cut at the Gellibrand Quarry. A five meter high bluestone wall between the quarry and the beech was also constructed by convict labour, and bushranger Ned Kelly reportedly worked on that retaining wall in 1873. The wall has since been removed. Other bushrangers who laboured at this quarry (and were accommodated in hulk ships) included Harry Power, Mad Dog Morgan, Thunderbolt and Captain Melville. The cruel Inspector General of Prisons John Price was brutally beaten at the quarry on 26 March 1857 and died from his injuries the following day.



# Lima South Quarry



The Lima South Quarry is operated privately and are suppliers of hornfels blue metal contact metamorphic aggregates which are highly sought after for rail ballast, concrete aggregates, asphalts and spray sealing applications. They also operate the Yarck Quarry where blue gray crushed rock and aggregates are quarried.



# Glenrowan Quarry

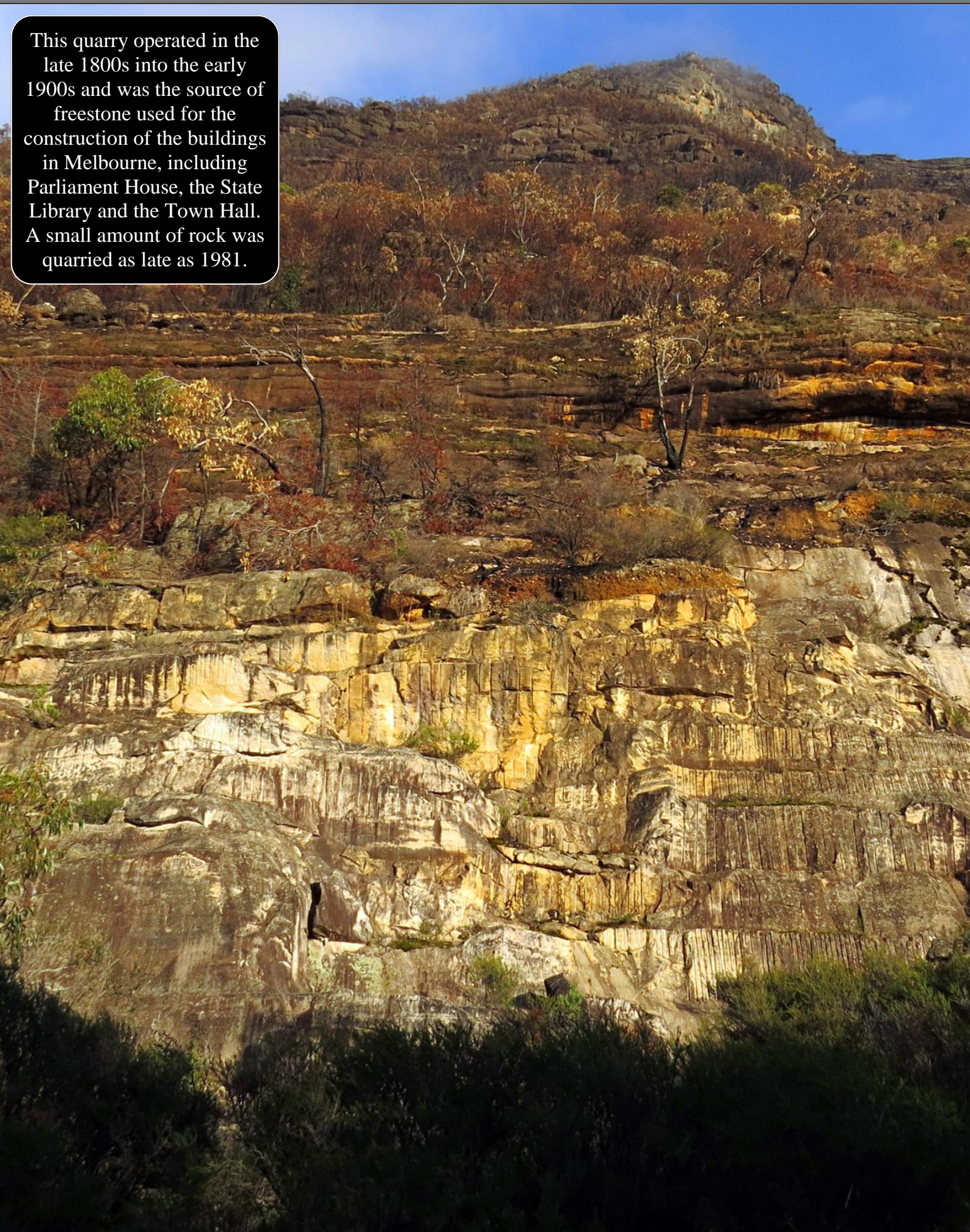


The Glenrowan Quarry is operated privately by the company Glenrowan Quarryies Pty Ltd. The quarry is one of Victoria's longest operating quarries, commencing in 1890 when it provided ballast for the Melbourne to Sydney railway line. Today it supplies rock, crushed rock and sand.




# Freestone Quarry

This quarry operated in the late 1800s into the early 1900s and was the source of freestone used for the construction of the buildings in Melbourne, including Parliament House, the State Library and the Town Hall. A small amount of rock was quarried as late as 1981.





# Barkers Creek Slate Quarry



Barkers Creek is home to the old Barkers Creek Slate Quarry, located on Specimen Gully Road. The Castlemaine Paving Company quarry came into being around 1865 after most of the gold was in the area had been extracted. Slate was used for paving, billiard tables, tombstones and hearths (floors of fireplaces).

SPECIMEN GULLY ROAD, BARKERS CREEK



# Newport Lakes



Newport Lakes is a former bluestone quarry site, that was then used as a tip before being formed into one of the more spectacular reserves close to Melbourne City.

OFF MASON STREET, NEWPORT



# Falls Creek



This quarry is in an alpine environment. It shows that just like at lower altitudes, rock is needed for things such as road construction and track maintenance.

NEAR THE LAKE AT FALLS CREEK



# Porters Pit, MacArthur



This quarry is located on the rim of a dormant volcano and was the source of volcanic scoria rock for many decades. Today it is abandoned and the area declared a National Park.



# OTHER

OTHER ITEMS OF INTEREST



# CLASSROOM LESSON

If you are wishing to teach children about rocks, you can use lollies and/or biscuits to help them understand the different kinds of rocks.

Buy foods that have similar visual characteristics to rocks:

<b>Jelly babies</b>	A mineral that looks like a single ingredient
<b>Teddy bear biscuits</b>	A mineral that looks like a single ingredient
<b>Liquorish allsorts</b>	Layers of different minerals presented in one rock
<b>M&amp;Ms</b>	Layers of different minerals presented in one rock
<b>Oreos</b>	Layers of different minerals presented in one rock
<b>Rocky road</b>	A conglomerate rock

Distribute five lollies or biscuits to each child. These should include ones that show a mineral (looks to be made from a single ingredient), rocks (appears to be made from multiple ingredients) and conglomerate forms (appears to have multiple rocks on one larger rock form).

1. Have the children observe the outer part of the lolly and determine if they can see just one ingredient or signs of multiple ingredients:
  - One ingredient is similar to a mineral
  - Multiple ingredients is similar to a rock made from minerals.
  - Lots of different pieces of lolly mixed together into one lolly is similar to a conglomerate rock.
2. Have the children bit half of the lolly away and describe what they see inside.
  - One ingredient all the way through is similar to a mineral
  - Multiple ingredients is similar to a rock made from multiple minerals.
  - Lots of different pieces of lolly mixed together into one is similar to a conglomerate rock.
3. Have the children record their findings on the printable chart (next page).



NAME	PREDICTION	ANSWER
The name of the lolly or biscuit (e.g. Jelly Baby)	Do you think it is a mineral (M), rock (R) or conglomerate rock (C)?	Circle the correct answer
	M   R   C	M   R   C
	M   R   C	M   R   C
	M   R   C	M   R   C
	M   R   C	M   R   C
	M   R   C	M   R   C



# ROCK FACTS

- **The rocks we see in our daily lives are made up of two or more minerals.** The rock granite is made up from quartzite, feldspar and mica. This is like a cake which is made up of ingredients such as flour, wheat and sugar to form one solid mass. In this example the cake's ingredients are minerals.
- **A mineral is a mass that is made up of just one natural substance.** This means it always looks the same, even if cut into pieces. There are around 3800 mineral in the world, but most are of small quantities and some are almost impossible to find.
- **Minerals are made from a combination of chemical elements.** There are 118 known elements. These include diamond, gold, silver, fluorite and quartz.
- **Eight elements account for more than 95 percent of the Earth.** These are silicon, calcium, iron, sodium, potassium, magnesium, aluminium and oxygen.
- **Crystals are formed from minerals that have had time to grow.** Different crystals form in different shapes. If they do not have much room, they look like a normal rock, but if they have room to grow, they can form into amazing shapes. Crystals can be too small to see with our eyes, or in rare instances, large enough to walk on. Most are smaller than a human hand.
- **Over time, rock are influenced by the temperature, water, wind and rain, which causes it to break down into smaller particles.** The smallest particle of rock is known as clay. Sand is also a rock and is larger than clay. A pebble is a rock that is between 2 mm and 64 mm, a cobble is a rock between 64 mm and 256 mm and a boulder is any rock that is larger than 256 mm. Therefore it is right to say that Uluru (Ayers Rock) is a boulder.
- **Much of the rock in the Earth's crust contains silica.** Silica is a compound of silicon and oxygen and it forms a large portion of the Earth's crust. Silica reacts with other compounds found in rock to form crystals.
- **The Earth's crust is less than one percent of the mass of the Earth** and is just over 30 km thick on average. But it is thinner at the bottom of our seas.





# BASIC GLOSSARY

SOME BASIC ROCK TERMS EXPLAINED



# BASIC GLOSSARY

<b>AGGREGATE</b>	<i>(noun)</i> A whole formed by the combination of numerous separate elements.
<b>AMPHIBOLES</b>	<i>(noun)</i> Any of a class of silicate or aluminosilicate minerals that develop fibrous or columnar crystals.
<b>BEDROCK</b>	<i>noun</i> ) The solid rock that forms the Earth's crust. Bedrock is often visible on mountains and along coasts where erosion has revealed it. Bedrock eventually is worn into smaller rocks and even finer particles such as sand.
<b>CHERT</b>	<i>(noun)</i> A fine grained silica rich microcrystalline, cryptocrystalline or microfibrinous sedimentary rock that may contain small fossils.
<b>COBOCHONS</b>	<i>(noun)</i> A gemstone which has been shaped and polished as apposed to faceted. It normally has a convex upper with a flat base. This was the default method of preparing gems before gemstone cutting was introduced.
<b>CUT</b>	<i>(noun)</i> The way a stone is faceted (prepared for display).
<b>DYKE</b>	<i>(noun)</i> A sheet of rock or matter that is formed in a fracture in existing rock. They can be magmatic or sedimentary.
<b>GEOLOGY</b>	<i>(noun)</i> The science that deals with the physical structure and substance of the Earth, their history, and the processes which act on them.
<b>INTRUSION</b>	<i>(noun)</i> A liquid rock that forms under the Earth's surface.
<b>FACET</b>	<i>(noun)</i> The main surface of a cut and polished gemstone which will be on display.
<b>FELSIC</b>	<i>(adjective)</i> Igneous rocks that are relatively rich in the elements that form feldspar and quartz.
<b>FISSILITY</b>	<i>(noun)</i> Having a tendency to split along flat parallel planes that are usually less than one centimetre in width.



# BASIC GLOSSARY

<b>FOSSIL</b>	<i>(noun)</i> The prehistoric remains of a plant or animal embedded in rock, or an impression of where the plant or animal once was.
<b>GRANULAR</b>	<i>(adjective)</i> Resembling or consisting of small grains or particles.
<b>IGNEOUS</b>	<i>(adjective)</i> Rock having cooled and solidified from magma or lava.
<b>LAPIDARY</b>	<i>(adjective)</i> Relating to the process of cutting, engraving or polishing of rock for display or sale.
<b>MATRIX</b>	<i>(noun)</i> The rock from which a gem is taken. This rock may also be referred to as its host or parent.
<b>METAMORPHIC</b>	<i>(adjective)</i> Donating or relating to rock that has undergone transformation by heat or pressure.
<b>MONOLITHIC</b>	<i>(adjective)</i> Formed of a single large block of stone.
<b>PHANERITIC</b>	<i>(adjective)</i> A term usually used to describe the grain size of igneous rock.
<b>PHOTOLITH</b>	<i>(noun)</i> The name given to the original un-metamorphosed rock from which a given metamorphic rock is formed.
<b>SEDIMENTARY</b>	<i>(adjective)</i> Rock formed from sediments deposited by water or air over long periods of time and often subjected to pressure.
<b>SCHIST</b>	<i>(noun)</i> A large-grained metamorphic rock made up of different minerals arranged in layers, which can be split into thin plates.
<b>SILICA</b>	<i>(noun)</i> A chemical compound that is found in nature mainly in sand or quartz. In industry it is used primarily to produce glass. Silica is the second most abundant chemical element on Earth behind oxygen.



# BASIC GLOSSARY

## **TUMBLING**

*(noun)* The name given to the technique of smoothing and polishing rock, where a number of rocks are placed in a rotating round container with abrasive grit and water, then rotated over a long period of time in order for the rocks to smooth each other.

## **VISCOSITY**

*(noun)* The state of being thick, sticky or semi-fluid in consistency due to internal friction.





*Artworkz*

*Serving the community*

*List of rock types*

*List of minerals*

*List of rock formations*