

VULCON Guidebook

Glossary

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Some Volcanic, Cave and Karst terms

- Aa** A type of lava surface in which the surface was too stiff to flow well, and so broke up into fragments. It is characterised by broken material which can vary from simple lumps to very sharp prickly fragments. It grades to pahoehoe (qv).
- Aeolian** Pertaining to the wind. Used for landforms generated by the wind, or sediments transported by the wind.
- Aeolianite** A rock formed from calcareous dune sands, a dune calcarenite (qv).
- Anthodite** Speleothems (qv) formed from clusters of needle or quill like crystals. Most anthodites are formed from the mineral aragonite (qv).
- Aragonite** An orthorhombic crystal form of calcium carbonate, typically occurring as many small acicular needles (see anthodite). Calcite (qv) is the more common crystal form of calcium carbonate.
- Arkose** A sandstone which contains 25% or more feldspar grains, derived from granitic sources. Arkosic is the adjective.
- Ash** Sand sized or finer-grained volcanic ejecta. Coarser material is called lapilli (qv).
- Bench** A horizontal shelf along the wall of a lava tunnel, generally close to floor level. It is formed at the edge of a lava flow level, by cooling and solidification of the edge followed by a lowering of the level. Some 'benches' form differently by the rolling down of a long flap of wall lining. Gradations can occur, eg. where a thin bench breaks free and starts to roll downwards.
- Bioclastic** Containing grains composed of fragmented and transported organic material, eg. shell fragments.
- Blind Valley** A valley that is closed off at its downstream end, all its water sinking at or near that point.
- Blister cave** Strictly, a cave formed by gas pressure pushing up a surface crust. True blisters are rare, and generally too small to enter. Some large ones are known overseas. The term has been misused locally for lava caves that are single simple chambers formed by localised drainage of liquid lava from beneath 'stony rises'.
- Bomb** A large fragment of volcanic ejecta. Some bombs show twisted forms indicating that they were still liquid when ejected, but solidified before landing. 'Breadcrust' and 'cowpat' bombs are named for their appearance.
- Bryozoa** 'Lace corals', a fossil that was common in warm shallow Tertiary seas.
- Burst** See 'flap'.

Cainozoic	The last of the geological eras, includes the Tertiary and Quaternary Periods. Extending from about 65 million years ago up to the present.
Calcarenite	An indurated (qv) sand composed mainly of detrital (qv) calcium carbonate fragments. A sand sized limestone.
Calclutite	A fine grained (silt and clay sized) limestone.
Calcirudite	A coarse (gravel sized) limestone. The clasts may be fossils or broken fragments of limestone.
Calcite	The common (trigonal) crystal form of calcium carbonate [CaCO ₃], typically occurring in caves as massive or finely crystalline speleothems (qv) or as larger crystal forms.
Calcrete	An indurated (qv) surface formed by weathering process involving cementation of the surface soils and weathered rock by calcite.
Chambering fissure	A fissure that forms behind and parallel to a cliff line, as a result of the outward rotation or sliding of large blocks.
Cave	As used by speleologists, this means an underground cavity, fissure, or tube large enough for penetration by humans. Speleologists exclude 'rock shelters' (qv) and most 'sea caves' (qv), by either stipulating that the cavity must penetrate further into the ground than the largest dimension of its opening, or by requiring that it should have a permanent dark zone. For the layman, the term 'cave' is commonly used to include rock shelters, and also to describe a single chamber within a cave system. This latter use can result in some confusion in the media, eg. 'the cave was destroyed' may merely mean 'one chamber was destroyed'. The term 'cave system' is sometimes used for the more complex caves, or to avoid the type of confusion mentioned above.
Cave coral	A form of speleothem (qv) that has nodular, prickly, globular, pop-corn or coral-like form. Its origin is a matter of some controversy, but is most likely due to seepage through the porous crystal structure and precipitation on the outer surfaces. It also occurs in lava caves as a secondary deposit.
Cenote	A type of steep walled, collapse doline that extends below the water table so as to contain a pool or lake.
Col	A hollow or saddle between hills.
Collapse dome	A chamber formed by progressive upward collapse of the roof until it reaches a stable dome-shaped form. A rubble mound will generally be present on the floor. Collapse is often initiated by the removal of hydrostatic support when the water level falls in a cave.
Cross bedding	Sets of inclined layers or beds, typically in dunes.
Deflation	The removal of loose fine grained material from a surface by wind action. One way of forming hollows that are not karst (qv).
Detritus	Material formed by mechanical breakage or abrasion of parent rocks. Detrital is the descriptive term.
Diagenesis	Post-depositional modification to a sediment. Typically involves compaction, cementation and induration (qv).
Doline	A closed depression formed by karst processes. Collapse Dolines form by collapse of the surface rocks into an underground cavity. Solutional dolines form by direct solution at the

surface. Subsidence dolines form by the downward movement of loose surface material such as soils into an underground cavity. A cenote is a special case of the collapse doline that contains a water-table pool.

Dry Valley	A valley in karst terrain that no longer has a surface flow of water. The talweg (qv) of such a valley may undulate with many closed depressions, and there may no longer be a distinct channel.
Duricrust	An indurated (qv) surface formed by weathering processes involving cementation of the surface soils and weathered rock by calcite (calcrete), iron oxides (ferricrete, or laterite), silica (silcrete) or other cements.
Epiphreatic zone	The uppermost part of the phreatic (qv) zone, just below the air-water contact. This is commonly an area of enhanced solution and therefore cave development.
Eustatic	Pertaining to world-wide changes of sea levels.
Flap	A section of wall lining in a lava tube that has broken free and sagged or rolled down away from the wall. Where only a small patch has been pushed off by gas pressure from behind it may be referred to as a 'burst'.
Flowstone	A general term for speleothems formed by precipitation from mineralised waters moving in films or sheets over a large surface area.
Fluvial	Produced by the action of a stream or river.
Foibe	A blind or dead-end shaft.
Foredune	A dune ridge built up behind a coastline. Generally higher and more extensive than a beachridge.
Grike	A surface landform comprising a solutional trench cut into the limestone along a joint.
Helictites	An unusual type of speleothem which has contorted branches that appear to defy gravity. Their origin has been a matter of some debate.
Hornito	A small spatter cone up to 5 m high which spits out red hot drops of lava.
Indurated	Soils and sedimentary rocks which have become hardened or cemented.
Kankar	A deposit, often nodular, of calcium carbonate formed in soils of semi-arid regions. Sometimes forms cave roofs. Similar to Calcrete (qv) and caprock.
Karren	Small scale sculpturing formed by solution processes on limestone and other soluble rock surfaces either exposed to the rain or buried beneath the soil.
Karst	The general term for landforms which includes caves, dolines (qv) and sculptured rock surfaces. Such landforms are formed in areas where solution processes, rather than mechanical erosion processes, predominate. Karst is most often seen in limestone.
Knobby pahoehoe	A form of pahoehoe (qv) lava in which the smooth surface is broken by numerous small knobs and lumps.
Lapies	A synonym for karren (qv), used mainly in the special case of Marine Lapies which form on limestone surfaces exposed to the sea, or to sea-spray. See also Phytokarst.
Lapilli	A general term for pebble to granule sized volcanic ejecta. Angular frothy fragments are called scoria. Finer material is ash and coarser fragments are called bombs or blocks.
Laterite	An iron rich deep weathering profile. Lateritised means containing laterite.

Lava	Molten rock that is capable of flowing on the surface or in lava tubes. See 'pahoehoe' and 'aa' for specific types.
Lava cave	A general term for any cave in lava. Most are lava tubes (qv), but some can form in other ways.
Lavacicle	Small round-tipped lava stalactites (qv), formed where molten lava has dripped from the roof, or dribbled down the walls of the cave.
Lava dribbles	Drips and associated runs of smooth surfaced lava on a vertical or sloping wall in a lava tube. Formed from a molten lining.
Lava drips	Short smooth-surfaced drips of lava on a ceiling or upper wall, formed from a molten lining. Grades to flatter 'lava dribbles' (qv) on the walls.
Lava hands	Groups of elongated finger or grape-like extrusions formed on a wall or roof where pasty lava has been forced out through a crack or hole in the lining. Matching 'lava stalagmites' (qv) may occur on the floor below. See also 'lava turds'.
Lava stalactites	Longer and thicker than 'lava drips' (qv). Rare straw-like lava stalactites have been recorded overseas.
Lava stalagmites	Mounds or columns of lava built up on a floor. Some may resemble 'lava turds' (qv), others are built up of numerous small semi-solid droplets to form agglutinated stalagmites.
Lava tube	A cave in lava formed by removal of liquid material from beneath a solid roof.
Lava turds	An appropriately descriptive term for small lava extrusions. A thick pasty lava has been forced out of a small orifice in the wall lining or floor. Analogies to dog, sheep, cow, etc. have been seen. See 'Lava hands' for a more polite, but less descriptive, term. 'Stoolite' and 'faecicles' have also been suggested!
Length of a cave	When cavers refer to the length of a cave, they generally mean the total passage length. This is invariably more than the distance from one end of the cave to the other (referred to as 'cave extent'), as the passages will wind, branch or even form complex mazes. Total passage length is a useful guide to the significant size of a cave, but ignores the visual significance of large chambers. This approach can confuse laymen (and the media) who may think of the length as referring only to the largest chamber, or the overall extent of the cave.
Levee	An outward sloping raised area on each side of a lava channel. Analogous to a river levee, it is built up by successive lava layers whenever the channel overflows.
Limestone	A rock composed of more than 50% calcium carbonate [CaCO ₃]. Dolomite is a variant that is rich in magnesium. Because of its solubility limestone is the most common host rock for caves.
Lithification	Hardening of sediment to form a rock.
Marl	A calcareous clay, or impure fine grained limestone.
Moonmilk	A soft, white, plastic speleothem composed of calcite and a variety of hydrated carbonate minerals in combination with water. It typically forms cauliflower-shaped areas which are initially soft and moist, but may become hard or powdery if they dry out.
Mottling	Blotchy or patchy color patterning.
Nothepheatic	Slow deep phreatic (qv) circulation of water.

Pahoehoe	A type of lava in which the surface was relatively fluid and so formed smooth or porridge-like surfaces. Variants include wrinkled or 'ropy' surfaces, like flowing pitch, and surfaces with small rounded knobs.
Palaeosols	Ancient soils.
Phreatic	That part of a cave environment that lies or once lay below the water-table. Also refers to the processes that act within the phreatic zone.
Phytokarst	A type of small scale solutional sculpturing or karren (qv) which forms with the assistance of certain algae and other micro-organisms that secrete acid solutions. Commonly occurs as a part of marine lapies (qv), and also as light oriented features below the water level in some cenotes (qv). Not the same as stromatolites (qv), which are depositional structures.
Puddings	A local term for small tumuli (qv) within lava tubes, but also applied to porridge like mounds of pahoehoe (qv) that have been squeezed up through an opening in a crusted floor.
Quaternary	The youngest of the geological periods, extending from the end of the Tertiary (qv) 1.6 million years ago up to the present. It is divided into the Pleistocene, and the Holocene which is the last 10,000 years. The Quaternary is the time of the great ice ages with widely fluctuating climates and sea levels.
Regression	A withdrawal of the sea from the land, due to uplift or a eustatic (qv) drop in sea level. See transgression.
Rhizomorph	A calcareous structure formed around roots, and preserving the form of the root.
Rillenkarrn	A pattern of narrow (1 cm), vertically oriented solutional grooves in a sloping limestone surface. A type of karren (qv).
Rising	Another term for a spring. A feature where water returns to the surface from an underground body of water.
Rock shelter	A cavity formed by overhanging rocks, typically at the base of a cliff. Rock shelters are often referred to as 'caves' by laymen and can be significant for archaeology, but speleologists prefer to exclude them from the definition of a 'true' cave (qv) as they do not penetrate any distance into the rock, and generally have no dark zone.
Ropy lava	Another term for pahoehoe (qv), especially the type with curved and twisted ridges.
Scoria	Refers to the angular pebble-sized frothy fragments that have solidified while flying through the air. Lapilli (qv) is a more general term for pebble to granule sized ejecta. Finer material is referred to as ash, and coarser fragments as bombs or blocks. Tuff (qv) is the name for consolidated ash.
Sea cave	Small chambers and fissures formed in coastal cliffs by wave action and salt spray weathering. When formed in limestone they may be true karst caves which have been exposed by marine action. See also 'Cave'.
Sink	A place where a surface water course disappears underground. Also known as 'streamsink'.
Sinkhole	Strictly, a hole or doline (qv) which acts as a streamsink. Unfortunately, the word has become debased by common misuse as a synonym for a doline (qv), especially a collapse doline.

Solution pipe	A vertical cylindrical shaft, often about 0.5 m across and up to 20 m deep, which is a characteristic of syngenetic karst areas.
Spatter	Molten material that was ejected from a vent or turbulent flow and which stuck together on landing to form a knobby rock in which the individual lumps are still just recognisable.
Speleogen	A sculpturing feature of the walls or roof of a cave, usually formed in the parent rock by solution or by erosion from running water.
Speleothem	A general term for all secondary mineral deposits in a cave. Includes stalactites, stalagmites, flowstone, and crystal growths. Terms such as 'formation' or 'decoration' are sometimes used in a similar manner, but can cause confusion, eg. with geological formations.
Spring	A feature where water returns to the surface from an underground body of water. Also known as a 'rising'.
Stalactite	A hanging speleothem formed by the dripping of water from a roof.
Stalagmite	A speleothem built up from a floor by water dripping from above. It will commonly have a matching stalactite above, and the two may eventually join to form a column.
Strandline	A coast line, present or ancient.
Stromatolite	A calcareous deposit, secreted by calcareous algae in the form of laminated domes and columns. Occurs in many cenotes (qv).
Swale	A linear hollow or depression found between dunes or beachridges. Generally marshy or swampy, or may contain small lakes.
Syngenetic karst	Karst landforms that are generated at the same time as the host sediment is being consolidated to become rock. A characteristic feature of the Australian Quaternary dune calcarenites.
Talweg	The line of lowest points along a valley floor, normally the stream channel. Also spelt 'Thalweg'.
Tectonic	Pertaining to large scale movements of the earth's crusts, such as Folding and faulting.
Terrigenous	Shallow marine sediments consisting of material derived from the land surface.
Tertiary	The geological time period lying between the Cretaceous and the Quaternary (qv), extending from about 65 to 1.6 million years ago. It occupies the bulk of the Cainozoic era. From oldest to youngest, the subdivisions are Palaeocene, Eocene, Oligocene, Miocene, and Pliocene. Tertiary climates in Australia were mainly warm and humid, with aridity first appearing towards the end of the Miocene and becoming widespread in the Pliocene.
Tidemark	A horizontal bench or a marking on a wall of a lava tube which indicates a prior lava level.
Transgression	An advance of the sea across the land, due to subsidence of the land, or a eustatic (qv) rise in sea level. Opposite of Regression (qv).
Tuff	A consolidated form of volcanic ash (qv) or lapilli (qv).
Tumulus	A rounded, sharply convex, mound of lava, frequently with radial or polygonal cracks, where a semi-solid crust has been pushed up by pressure from below. Normally used for large features on surface lava flows, but can also be applied to small mounds on a lava tube floor. See 'Puddings'. Plural is 'tumuli'.

Unconformity	A time break in a depositional sequence.
Uvala	A composite karst depression consisting of several smaller closed depressions coalescing into an irregular form.
Vadose	That part of the cave environment that lies or once lay above the water table. Also refers to the erosional processes that act in that zone.
Vadose flow	Refers to stream flow within the vadose zone, ie. a cave stream in contact with air.
Vadose seepage	Refers to water moving downward through the vadose zone, either in narrow fissures, or on the walls of air-filled caves.

References

For further information on general karst and speleological terms see:

Jennings, J.N., 1985, *Karst Geomorphology*, Blackwell, Oxford.

Jennings, J.N., 1985, Cave and Karst Terminology. IN: Matthews, P.G. (Ed), 1985, *Australian Karst Index*, Australian Speleological Federation Inc, Melbourne, pp 14-1 to 14-13.

For additional information and photographs of cave minerals see:

Hill, C.A. & Porti, P., 1986, *Cave Minerals of the World*, National Speleological Society, Alabama, USA.

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