
Glossary

This glossary provides brief explanations of the technical terms used in the introductions to the chapters and in the 'conclusions' sections of the site reports. These explanations are not rigorous scientific definitions but are intended to help the general reader. Detailed stratigraphical terms are omitted as they are given context within the tables and figures.

Abrasion: the process of wearing away parts of fossils or rocks by sediment-laden water or air. The process produces an increasingly smoothed and rounded outline shape.

Acritarchs: cyst-like microfossils that are probably the remains of algae.

Aeolian: descriptive of sediments deposited by wind.

Aestivation: a state of dormancy or torpor during the summer or periods of drought.

Agate: a banded form of chalcedony.

Age: a time unit (cf. chronostratigraphy), usually taken to be the smallest standard division of geological time, of shorter duration than an epoch.

Agglomeration: a mass accumulation.

Aide dune: a network of sinuous sediment ridges made up of crescentic sections.

Alabaster: a fine-grained, white or pale coloured, massive form of gypsum.

Albian Age: a geological time division (age; cf chronostratigraphy) ranging from 112 to 97 million years ago; part of the Late Cretaceous Epoch.

Algal mats: large sheets of thin layers of single-celled plants that help to stabilize the surface of the underlying sediment.

Alkali feldspar: a group of silicate minerals (see silica) rich in potassium, aluminium and sodium.

Alluvial fan complex: a fan- or cone-shaped mass of sediment deposited by a stream or river at the point where it emerges from a valley onto an open plain.

Alluvium (adj. alluvial): sediment deposited by rivers.

Ammonite: an extinct cephalopod, a relative of the living Nautilus, characterized by a coiled, chambered, shell. Ammonites lived in marine environments and were common throughout the Mesozoic Era.

Amphibian: a dominantly terrestrial group of animals that lay their eggs in water, for example frogs, toads and salamanders.

Amygdale: rounded cavities found in lavas that have been infilled with minerals.

Amygdaloidal: a rock that contains many amygdales.

Angular unconformity: an unconformity characterized by an angular discordance between bedding planes either side of the unconformity surface; or where undeformed younger rocks overlie folded stratigraphically older rocks.

Anhydrite: a mineral (CaSO₄) formed by evaporation, often associated with gypsum.

Anisian Age: a geological time division (age; cf. chronostratigraphy), part of the Mid Triassic Epoch.

Anomodont: a suborder of extinct herbivorous reptiles, which ranged from Late Permian to Late Triassic times.

Anoxic: without oxygen.

Anticline: a convex-up fold.

Apatite: a calcium phosphate mineral found in the bones of vertebrates.

Aphanitic: an igneous rock composed of crystals that are invisible to the naked eye.

Aragonite: a form of calcium carbonate commonly found in the shells of invertebrates. It is less stable than calcite and is more soluble in cold water than in warm. It is often replaced by other minerals, such as calcite, in fossils.

Archipelago: a group of islands.

Archosaur: a group of animals that include crocodiles, dinosaurs, pterosaurs and the-codonts.

Arenaceous: descriptive of clastic sediments made up of sand-sized particles (see sandstone).

Argillaceous: descriptive of fine-grained clastic sediments made up of silt- or clay-sized particles.

Arkose: an arenaceous rock that contains at least 25% feldspar.

Arthropod: a jointed-limbed, invertebrate animal with an external skeleton, for example insects, crabs and shrimps.

Articulated: relating to the skeletons or fossils with all the hard parts connected or in life position.

Artinskian Age: a geological time division (age; cf. chronostratigraphy), the penultimate part of the Early Permian Epoch.

Asselian Age: a geological time division (age; cf. chronostratigraphy), the first part of the Early Permian Epoch.

Assemblage: a collection of plants and animals that are characteristic of a certain environment and/or period of geological time.

Associated bones: used to describe a skeleton where all of the bones are present but jumbled together (cf. articulated).

Asymptotic: the curved base of a cross-bed foreset.

Aureole metamorphism: the halo of metamorphic rocks found around an igneous intrusion.

Backwash: the movement of water back down a beach after a wave breaks.

Bar: a linear feature of built-up sediment found in the sea or in rivers.

Barchan dune: a crescent-shaped dune.

Barite (also spelt barytes): a whitish, heavy mineral (BaSO_4).

Basalt: a fine-grained igneous rock formed by a volcanic eruption.

Basin: an area of low-lying ground that acts as a focus for sediment deposition.

Bed: the smallest lithostratigraphical unit, a single layer of sediment bounded by bedding planes. Also used informally to indicate a stratum in a sedimentary rock succession.

Bedform: the shape of the surface of a bed of granular sediment, produced by the flow of air or water over the sediment, e.g. ripples.

Bedding plane: planar feature in sedimentary rocks representing an original surface of deposition. Conspicuous bedding planes may indicate a short interruption in, or change in character of sediment deposition.

'Beef': a fibrous form of calcite, which frequently has the appearance of a series of 'nested' cones stacked one inside the other.

Belemnite: an extinct type of cephalopod, a relative of modern squids. Belemnites had a long, bullet-shaped internal cone of calcium carbonate.

Berm: a ridge of sediment developed on a beach.

Bifurcating: dividing into two.

Bi-modal: having two statistical modes('peaks'), for example a sample of sediment with two dominant grain sizes.

Bioclastic: consisting largely of broken shell or bone debris.

Biogenic: describes sediments that have been produced by animals, for example coral reefs.

Biostrome: a sheet-like mass of organic material that forms rock, for example stromatolites.

Biotite: a type of mica.

Bioturbation: the mixing of layers of unconsolidated sediment by the action of animals or plants, especially 'churning' by burrowing animals.

Birdseye structure: a sedimentary structure characterized by irregular cavities infilled with minerals such as sparry calcite. These features are frequently found in limestones and are indicative of intertidal environments.

Bisaccate: a pollen grain with two clearly-defined air sacs.

Bitumen: naturally occurring hydrocarbons.

Bituminous: descriptive of sediments that contain large quantities of bitumen.

Bivalve: an aquatic invertebrate with two hard calcareous shells (valves). The valves are generally mirror images of each other, for example cockles.

Body fossil: a fossil composed of the preserved remains of the body of an animal.

Bone bed: a sedimentary bed that contains a high proportion of bones, teeth and scales.

Boulder: sedimentary particle with a diameter of more than 256 mm.

Bounding surfaces: erosional surfaces in cross-bedded sedimentary rocks formed by the migration of dunes and other bed-forms, associated with aeolian sediments.

Brachiopod: also known as 'lampshells'. Marine animals that have two shells, which are typically dissimilar to each other (cf. bivalves) and live attached to the sea floor by a muscular stalk.

Braided channel: a stream or river characterized by interlinking channels separated by islands and sandbanks.

Braidplain: an area that supports a system of braided channels.

Branchiopod: a small crustacean with flattened limbs used in swimming, often called 'gill-footed shrimps'.

Breccia: a sedimentary rock consisting of angular pebbles (cf. conglomerate).

Brecciation: the process of breaking rocks into angular fragments, which form a breccia.

Breccio-conglomerate: a sedimentary rock consisting of both angular and rounded pebbles.

Bryophyte: a group of plants that includes mosses and liverworts.

Calcarenite: a calcareous, clastic sediment with sand-sized grains.

Calcareous: containing large quantities of calcium carbonate (CaCO₃).

Calcification: the process of increasing the proportion of calcium carbonate in a rock or fossil.

Calcirudite: a coarse-grained sediment (with a grain size greater than 2 mm diameter) that has been cemented by calcium carbonate (CaCO₃).

Calcite: calcium carbonate (CaCO₃), the dominant component of limestones.

Calcrete: a 'fossil soil' (palaeosol) rich in calcium carbonate, indicative of arid or semi-arid environments.

Caliche: nodules of carbonate that form in soils in seasonally arid environments.

Canyon: a deep, narrow gorge that generally has a river at the bottom.

Capitanian Age: a geological time division (age; cf. chronostratigraphy), the last part of the Middle Permian Epoch.

Capitosaur: an extinct amphibian known only from Triassic strata. These animals had flat skulls up to 1 m long and small limbs.

Carbonaceous: containing large quantities of carbon.

Carbonate: a mineral that contains the carbonate ion (CO₃)²⁻.

Carboniferous Period: a geological time division (period; cf. chronostratigraphy) from 362 to 291 million years ago. It preceded the Permian Period.

Carnian Age: a geological time division (age; cf. chronostratigraphy); part of the Late Triassic Epoch.

Celestite (formerly celestine): a mineral, strontium sulphate (SrSO₄), generally associated with sedimentary rocks.

Cement: the mineralogical 'glue' that holds sedimentary particles together.

Cephalopod: a group of marine molluscs that includes extinct ammonites and belemnites, and living pearly nautilus, cuttlefish, squid and octopus.

Chalcedony: a variety of quartz that is composed of microscopic crystals or fibres.

Chalk: a poorly lithified, porous white limestone. Stratigraphically, *the Chalk* (a proper noun with a capital letter) is used synonymously with the Upper Cretaceous Series, which formed during the Late Cretaceous Epoch.

Changhsingian Age: a geological time division (age; cf. chronostratigraphy); part of the Late Permian Epoch.

Channel-fill: sediments deposited within a stream or river channel.

Channel lag: a layer of coarse-grained sediment found at the bottom of channels. See winnowed lag deposits.

Charophyte: single-celled planktonic plantlike organism.

Chert: a form of silica characterized by microscopic crystals.

Chlorite: a mineral with a greenish colour that often occurs as small flakes in sedimentary rocks.

Choristodere: an extinct aquatic reptile that looked superficially crocodile-like.

Chronostratigraphy: the correlation and subdivision of rock units on the basis of relative age — a hierarchy of sequential units to which the layers of sedimentary rocks are allocated, through the study and interpretation of their stratigraphy. The hierarchy of principal chronostratigraphical units is system, series and stage, which are related, respectively, to the geological time units of period, epoch and age. Rocks of the Jurassic System (a chronostratigraphical unit) were laid down in the Jurassic Period (a geological time unit).

Cirripedes: barnacles.

Clast (adj. clastic): a sedimentary particle, a fragment of a pre-existing rock or fossil (bio-clast).

Clay: very fine-grained sediment with a grain size less than 0.0039 mm.

Cleithrolepid fish: a primitive group of ray-finned fish.

Climbing ripple lamination: ripples formed when sediment is deposited on the upstream and downstream sides of the bed-form.

Cobble: a piece of rock with a diameter of between 64 and 256 mm. Generally rounded or subrounded in shape.

Conchoidal: a curved fracture surface with concentric ribs ('shell-like').

Concretions: masses or accumulations of minerals or mineralized sediments that form around a nucleus after deposition of the sediments.

Confluence: the joining point of two rivers.

Conglomerate: a sedimentary rock consisting of rounded pebbles (cf. breccia).

Conjugate veins: two sets of veins formed at the same time but orientated at different angles.

Contact metamorphism: the alteration of rocks caused by contact with hot igneous rocks.

Contemporaneous: occurring at the same time.

Contorted bedding: beds that are highly deformed.

Coprolite: preserved and fossilized droppings.

Coquina: a bioclastic limestone composed of cemented shelly material.

Coral: aquatic invertebrate animals that secrete a calcium carbonate external skeleton. They may live as individuals or in large colonies.

Cornstone: a limestone composed of large pellets of sediment.

Correlation: the tracing and identification of a stratigraphical unit away from its type area by comparing lithologies and/or faunas.

Corrensite: a chlorite-rich vermiculite.

Coset: a stack of sets.

Crescentic dune: see barchan dune.

Cretaceous Period: a geological time period (cf. chronostratigraphy) ranging from 145.6 to 65 million years ago. The last period of the Mesozoic Era.

Crevasse splay: a small fan-shaped accumulation of sediment formed when a river breaks through its banks or levee.

Crinoid: a primitive marine invertebrate related to living sea urchins. The animals generally have a long stalk attached to a solid surface, the stalk supports a flower-like arrangement of tentacles, hence the informal name 'sea lily'.

Crocodile: a semi-aquatic living archosaur.

Cross-bed, cross-lamination, cross-stratification: a series of inclined bedding planes deposited by currents (rivers, wind or coastal). Large-scale features are named 'cross-stratification', smaller-scale features are known as 'cross-bedding'; 'cross-laminations' are the finest-scale forms.

Crustacean: a subdivision of the arthropod group that includes lobsters, shrimps, barnacles and woodlice.

Cryptalgal: laminations of algae and sediment.

Crystalline: composed of many crystals.

Cyclic sedimentation: a repeated sequence of sedimentary units.

Cyclothem: the series of sediments produced by cyclical sedimentation.

Debris flow: a flow of water and sediment; even large boulders can be carried in flows of this kind.

Decalcification: the removal of calcium carbonate from sediments.

Deflation: blowing away of fine sand by wind.

Deflation layer or lag: the coarse-grained material selectively left behind, and concentrated, when finer material is blown away.

Deformation: changes in shape or volume of rock after its formation; including folding and faulting.

Delta (adj. deltaic): a fan-shaped or irregular mass of sediment deposited when a river enters a lake or the sea.

Dendritic: with a tree-like shape.

Desiccation cracks: cracks formed when wet sediment dries out.

Detrital minerals: minerals derived from pre-existing rocks.

Devonian Period: a geological time period (cf. chronostratigraphy) ranging from 408 to 362 million years ago. The period precedes the Carboniferous.

Diachronous: descriptive of a rock body that appears to be continuous, but was deposited at different times in different places, so that the rock body is not everywhere the same age.

Diagenesis (adj. diagenetic): processes (chemical, pressure, temperature) that alter the mineralogy and texture of sediments and fossils when they are close to the Earth's surface; the term excludes metamorphic alteration.

Dinantian: a stratigraphical term that relates to the Lower Carboniferous Series in Europe.

Dinoflagellate: a single-celled planktonic organism related to algae that have two flagella (tails) that are used in movement.

Dinosaur: an extinct large terrestrial reptile that lived between the Triassic and Cretaceous periods.

Dip: the angle between a surface and a horizontal plane.

Dipnoan: describing a group of bony fishes that include the living lungfish.

Disarticulate: the process of breaking a skeleton (invertebrate or vertebrate) into its constituent parts.

Disconformity: see unconformity.

Dissolution cavity: a small hole in rock formed when rock is unevenly dissolved.

Distal: in the downstream direction; away from the source.

Dolerite: a medium-grained igneous rock that generally occurs in dykes and sills.

Dolomicrite: a fine-grained limestone composed primarily of dolomite.

Dolomite: a calcium carbonate mineral with magnesium chemically incorporated in the crystal, its chemical formula is $\text{CaMg}(\text{CO}_3)_2$. Also a rock that contains more than 15% magnesium carbonate.

Draa: a large dune that often has smaller dunes on its crest. Thought to be formed when dunes coalesce.

Dreikanter: a fragment of rock that has been shaped by sandblasting by wind. The term is German, and means literally 'three-edger'. Dreikanter have a characteristic shape with three sides separated by sharp edges.

Dune: a ridge of sediment that occurs in several forms: barchan, draa and seif.

Dune field: an extensive area covered with large numbers of dunes.

Dyke: vertically orientated bands of rock. The term is generally applied to igneous rocks which have 'intruded' or 'cut through' preexisting rocks, although sedimentary (Neptunian) forms occur.

Dyke swarm: a collection of dykes.

Early Permian Epoch: a geological time division (epoch; cf chronostratigraphy), the first part of the Permian Period, comprising the Asselian, Sakmurian, Artinskian and Kungurian ages.

Early Triassic Epoch: a geological time division (epoch; cf. chronostratigraphy), the first part of the Triassic Period equivalent to the former Scythian Epoch, comprising the Induan and Olenekian ages

Ebb currents/flow: the movement of the tide out to sea.

Echinoderm: a group of animals with calcite plates, including sea urchins and crinoids.

Echinoid: sea urchin.

Ecosystem: a physical environment complete with its interacting fauna and flora.

Epichnal ridges: trace 'fossil' ridges that stand proud of the sediment or bedding plane surface.

Epoch: a unit of geological time (cf. chronostratigraphy), of shorter duration than a period and itself divisible into ages (e.g. the Late Triassic Epoch).

Epidote: a group of complex silica-rich minerals.

Era: one of five major divisions of geological time. The Permian Period precedes the Mesozoic Era, which comprises the Triassic, Jurassic and Cretaceous periods.

Erg: a sand sea.

Erosion: the wearing away of the land's surface by mechanical processes such as the flow of water, ice or wind.

Estuarine: relating to estuaries, where a river opens into the sea or lake.

Euhedral: fully developed crystal forms.

Evaporite: a sediment that results from the evaporation of saline water.

Evapotranspiration: the combined loss of water from soil, water bodies and plants.

Exfoliation weathering: a weathering process that results in the separation of thin sheets of rock (also called 'onion skin weathering').

Fabric: the arrangement or pattern of clasts within sediments and sedimentary rocks.

Facies: the total characteristics of a rock, including the rock type, any sedimentary structures (for example bedding), and fossils. Together these features indicate a characteristic environment of deposition.

Fan: a low-lying accumulation of sediment with a roughly triangular outline. See alluvial fan complex.

Fault: a fracture within a rock along which there has been displacement due to tectonic deformation (e.g. earthquakes).

Fauna: animals — often referring to the characteristic animal assemblage of a region or time period.

Feldspar: a group of complex silica-rich minerals.

Felsite: a very fine-grained igneous rock.

Fenestrae: cavity structures, which are generally infilled with crystals, also called birdseye structures.

Fenestral: a rock containing many fenestrae.

Ferric oxide: a form of iron oxide (Fe_2O_3)

Ferricrete: a 'fossil' soil (palaeosol) that contains large quantities of iron minerals as nodules or glaebules.

Ferroan calcite: calcite that contains substantial quantities of iron within the crystalline structure.

Ferrous oxide: a form of iron oxide (FeO).

Ferruginous: iron-rich.

Fining-upwards: a series of sedimentary beds that show a gradual decrease in grain size up through the rock succession.

Fissile: splits easily.

Fissure: a naturally occurring opening in a rock.

Flaggy: descriptive of sedimentary rocks that split easily into thick sheets or flagstones.

Flame structure: structures with an irregular flame-like shape, formed when an unconsolidated layer of sediment is covered by a layer of denser sediment. The dense material pushes down into the underlying sediment, which is squeezed upwards in 'flames'.

Flaser bedding: cross-laminated sandstones that contain mudstone streaks.

Flash flood: a short-lived but rapid rise in water level in a river caused by heavy rainfall and surface runoff.

Flint: a variety of chert.

Floodplain: the level surface next to a river that is water covered during times of flood.

Flora: plants — often referring to the characteristic plant assemblage of a region or time period.

Flowstone: calcium carbonate rock deposited in caves.

Fluid escape/injection structures: deformation of sediments caused when water is forced out of the sediments during compaction, producing swirls and triangular forms and deformed bedding.

Fluorite: a mineral, calcium fluoride, CaF_2 .

Flute marks/casts: structures formed by small eddies that carve depressions in the surface of a sediment deposit. The cavities are asymmetrical in outline, with the deeper or thicker part at the upstream end, and are generally preserved on the base of the overlying bed as a 'cast' of the depression.

Fluvial, fluvatile: pertaining to rivers.

Fluviolacustrine: an environment dominated by rivers and lakes.

Fold: a flexure in rocks.

Foraminifera: single-celled aquatic animals that have a protective external shell, often with an elaborate form, and usually composed of carbonate or agglutinated sand grains. These micro-organisms are usually less than one millimetre in diameter (a few are larger).

Foreset: steeply dipping surfaces of cross-bedded strata.

Formation: a stratigraphical term used to describe the basic unit in lithostratigraphy; a mappable unit dominated by one lithology; may include members.

Fossil: the preserved remains of animals and plants.

Fossiliferous: containing abundant fossils.

Freestone: a quarry term used to describe rocks that are easily quarried.

Friable: crumbly.

Fulgurite: thin, irregular and elongate tubes of fused sediment caused when a lightning strike melts unconsolidated sediment.

Galena: lead sulphide (PbS), the most important ore of lead.

Gastropod: a mollusc with a spiral shell; for example a snail.

Geochemistry: the application of chemistry to geological processes and phenomena.

Geomorphology: the study of landforms.

Glacial: relating to the processes in and around glaciers and ice caps. A period of the Earth's history characterized by 'ice age' conditions.

Glaebule: a concretion found in palaeosol profiles.

Glaucanite: a green-blackish or yellowish mineral that occurs as small granules in marine sedimentary rocks.

Goethite: a hydrated iron oxide mineral.

Graded beds: beds that show a change in grain size through the bed. Normal graded bedding is a fining upwards sequence. In reverse graded bedding, the grain size coarsens upwards.

Grain supported: a sedimentary texture where the constituent grains are in contact, with little sediment in filling the spaces.

Grainflow lamination: thin structureless sandstone layers.

Grainstone: a type of limestone with very little matrix.

Granite: a coarse-grained igneous rock.

Granule: a rock fragment with a diameter of between 2 and 4 mm.

Granulite: a metamorphic rock with a granular texture, with a preferred orientation of the crystals.

Gravel: sedimentary particles with a diameter from 2 mm to greater than 256 mm (granule to boulder) size range.

Greensand: a lithostratigraphical unit of the Cretaceous System. A greensand is a sedimentary rock that contains a green mineral called glauconite.

Greywacke: an arenaceous sediment composed of fine- to coarse-grained, angular to subangular clasts that are mainly composed of rock fragments.

Gritstone: a coarse-grained sedimentary rock.

Groundwater: water that occupies cavities and fissures in the Earth's crust.

Gutter casts: casts (sediment infills) of small channels that often cut across low-lying muddy plains or mud flats.

Gypsum: a calcium sulphate ($\text{CaSO}_4 \cdot 2\text{H}_2\text{O}$) mineral often associated with evaporite deposits; the hydrous form of anhydrite.

Haematization: the processes that lead to the increase in quantities in haematite.

Haematite: an iron oxide (Fe_2O_3) often used as a source of iron ore.

Half-graben: a sedimentary basin formed when a large block of crust tips down. The down-faulted side is generally fault guided.

Halite: 'common' salt (NaCl) formed as an evaporite mineral.

Hanging gully or valley: a gully or valley that enters a larger valley part way up the valley side.

Hardground: a horizon of cementation occurring in limestones, often encrusted by invertebrates.

Hercynian: descriptive of a mountain building episode that occurred during the Carboniferous and Permian periods.

Hettangian Age: a geological time division (age; cf chronostratigraphy), the first part of the Jurassic Period.

High flow regime: high-energy or high-velocity conditions in fluvial systems.

Hopper crystal: cube-shaped crystals with indented stepped faces.

Horizon: a single bed or layer of a sedimentary rock.

Hornfels: a medium- to fine-grained rock produced by thermal metamorphism.

Hypersaline: descriptive of water with a particularly high salt content.

Ichnogenera: a name given to groups of trace fossils.

Ichnotaxon (plural: **ichnotaxa**): a name given to groups of trace fossils

Ichthyosaur: extinct sea-living reptiles that lived during the Mesozoic Era, with an outline shape similar to living dolphins.

Igneous: rocks produced by volcanic activity or intrusive igneous processes from magma (molten rock).

Illite: a clay mineral.

Imbrication: a fabric found in coarse-grained sedimentary rocks. The flat or elongate clasts are stacked up, leaning on each other.

Induan. Age.: a geological time division (age; cf. chronostratigraphy), the first part of the Early Triassic Epoch.

Indurated: a well-cemented sedimentary rock.

Inlier: a small outcrop of older rocks completely surrounded by stratigraphically younger strata.

Interbedded: alternations between two types of lithology.

Interdune: the lowlying area between dunes.

Intertidal: the region of the shoreline between the high and low tide lines.

Intraformational: formed within the confines of a sedimentary basin.

Intrusive igneous: igneous rocks formed when large masses of molten rock are emplaced or pushed up into the Earth's crust.

Iron pan: a thin layer of concentrated iron that form in soils and may be preserved in palaeosols and other sedimentary units.

Ironstone: a sedimentary rock that contains a substantial proportion of iron, often in the form of siderite (an iron carbonate).

Isolate ripple: a single ripple.

Isthmus: a narrow piece of land that connects two larger areas of land.

Jasper: a red variety of chalcedony.

Joint: a fracture in rocks, along which there has been no movement (cf. fault).

Jurassic Period: a geological time division (period, cf. chronostratigraphy) between 199 and 145.6 million years ago. It follows the Triassic Period.

Kaolinite: a clay mineral.

Karst: a landscape of weathered and eroded limestone.

Kungurian Age: a geological time division (age; cf. chronostratigraphy), the last part of the Early Permian Epoch.

Labyrinthodont: a group of primitive amphibians that lived during the Permian and Triassic periods.

Lacustrine: pertaining to lakes.

Ladinian Age: a geological time division (age; cf. chronostratigraphy), part of the Middle Triassic Epoch.

Lag deposit: a concentrate of coarse-grained sediments that accumulates at the bottom of a channel, formed by winnowing. See also winnowed lag.

Lagoon: an area of shallow water, generally salt water, cut off from the sea by a narrow ridge of land.

Laminated: descriptive of a bed with a fabric composed of laminae — thin layers of rock.

Laminations: millimetre-scale layers of sediment.

Late Permian Epoch: a geological time division (epoch, cf. chronostratigraphy), the ultimate part of the Permian Period, consisting of the Wuchiapingian and Changhsingian ages, which correspond with part of the former Tatarian age.

Late Triassic Epoch: a geological time division (epoch, cf. chronostratigraphy), the ultimate part of the Triassic Period consisting of the Carnian, Norian and Rhaetian ages

Lava: an igneous rock formed during volcanic eruptions.

Lee faces: the downstream faces of ripples and dunes.

Lenticular bedding: small lenses of cross-bedded sandstone in argillaceous sediments.

Leucoxene: a white mineral rich in titanium and iron.

Lias: a lithostratigraphical division that equates largely to the Lower Jurassic Series, rocks that formed during the Early Jurassic Epoch.

Limestone: sedimentary rock composed primarily of calcium carbonate (CaCO_3).

Linear dune: elongate sand dunes.

Linguoid ripple or bar: curved ripples or bars, the concave surface of the upstream ripple faces.

Linsen bedding: see lenticular bedding.

Litharenite: an arenaceous rock composed of lithic clasts.

Lithic fragments: rock clasts found within sedimentary rocks.

Lithification: the process of turning sediments into rock.

Lithographical: a very fine-grained limestone that was used in the production of litho-graphical illustrations.

Lithofacies: a facies characterized by a particular rock type.

Lithology: the general characteristics of a sediment, including texture and composition.

Lithostratigraphy: the determination of the stratigraphical relationships between rocks based on their lithology.

Littoral: the environment found between the limits of the high and low tides.

Liverwort: a primitive plant, (bryophyte).

Loess: accumulations of wind-borne dust.

Longshore drift: the movement of beach material along the coast caused by waves breaking obliquely to the shoreline.

Lunate ripple or bar: curved ripples or bars, the convex surface of the ripple faces upstream.

Lungfish: fish that are able to breathe air using an air sac or lung.

Macrofossil: a fossil that is easily seen by the naked eye.

Magnetite: an iron mineral (Fe_3O_4).

Malachite: a complex copper-carbonate mineral with a bright green colour banded with black.

Mammal-like reptiles: a group of animals that have both mammal and reptile-like characteristics. They lived from Late Permian to Early Jurassic times.

Marginal: 'coastal' or 'beach'; refers to sediments deposited on the margin between the sea, or a large lake, and land.

Marl: a very fine-grained calcium carbonate-rich mud or clay.

Massive: sedimentary layers that have no internal structures.

Mass movement: the downslope movement of surface materials, often assisted by water.

Matrix: the sediment, usually very fine grained, which infills the spaces between the larger grains.

Meander: a wide loop in the course of a river.

Megalosaurus: a carnivorous dinosaur.

Member: a stratigraphical term referring to a group of several beds; members may be defined within formations.

Mesozoic Era: a geological time division (era; cf. chronostratigraphy) comprising the Triassic, Jurassic and Cretaceous periods, ranging from 251 to 65 million years ago.

Metamorphic rock: rocks altered by the action of heat and/or pressure.

Mica: sheet-like minerals rich in silica.

Micaceous: containing large quantities of mica.

Micrite: very fine-grained calcium carbonate sediment that acts as an infilling matrix in calcareous rocks.

Microcline: a type of feldspar.

Microfossil: a microscopic fossil.

Microgranite: a type of granite with characteristically small crystals.

Microquartz: an arrangement of microscopic quartz crystals.

Microspar: an arrangement of microscopic crystals.

Middle Triassic Epoch: a geological time division (epoch, cf. chronostratigraphy), part of the Triassic Period consisting of the Anisian and Ladinian ages.

Middle Permian Epoch: a unit of geological time (epoch, cf. chronostratigraphy), part of the Permian Period consisting of the Roadian, Wordian and Capitanian ages.

'Millet-seed' sandstone: sandstone composed of well-sorted, rounded and frosted grains.

Mineralogy: the study of minerals, the mineral constituents of a rock.

Miospore: a microscopic fossil produced by land plants (spores, pollen).

Moinian: a stratigraphical division of the Scottish Precambrian strata.

Mollusc: a group of invertebrate animals with shells that includes gastropods, bivalves, ammonites and belemnites.

Monosaccate: descriptive of a pollen grain with one air sac.

Moraine: the jumbled mass of poorly sorted sediments deposited by glaciers.

Mottled: descriptive of a sediment that has irregular patches of colour.

Moulds: an impression produced by an original form. The counterpart of a 'mould' is a 'cast'.

Mud crack: cracks in mud produced by the drying out of wet sediment.

Mudstone: a very fine-grained rock.

Muscovite: a type of mica.

Neoselachian shark: modern shark.

Neptunian dyke: a cross-cutting, often vertical or sub-vertical feature formed when sediments infill fissures in pre-existing rocks. The infilling process is thought to have taken place under water.

Nodule: a spherical or oval rounded concretion.

Norian Age: a geological time division (age; cf chronostratigraphy) part of the Late Triassic Epoch.

Olenekian Age: a geological time division (age; cf. chronostratigraphy), the last part of the Early Triassic Epoch.

Olivine: a complex group of silica-rich minerals that also contain magnesium, iron and calcium.

Onion skin weathering: see exfoliation weathering.

Onlap: associated with unconformities, beds that successively overlap each other.

Oolith: a small, generally sand-sized, spherical concretion made of calcium carbonate.

Oolitic: describes rocks composed of ooliths.

Ophiuroid: a type of echinoderm, a brittle star.

Ordovician Period: a geological time division (period; cf. chronostratigraphy) ranging from 510 to 439 million years ago.

Orthoclase: a type of feldspar.

Ostracod: a microinvertebrate animal (crustacean) with two shells.

Overgrowth: the deposition of secondary minerals around original minerals and clasts, often by the cementing minerals.

Palaeoclimate: ancient (occurring in geological time) climate.

Palaeoenvironment: ancient (occurring in geological time) environment.

Palaeogeography: ancient (occurring in geological time) geography.

Palaeokarst: ancient (occurring or formed in geological time) karst landform assemblage.

Palaeoshoreline: ancient (occurring in geological time) shoreline.

Palaeoslope: ancient (occurring in geological time) slope.

Palaeosol: ancient or 'fossilized' soil.

Palaeontology: the study of fossil animals and plants.

Palaeowind: ancient (occurring in geological time) wind.

Palygorskite: a fibrous type of clay mineral found in sedimentary rocks.

Palynology: the study of fossil terrestrial spores, pollen and aquatic algal cysts, geological dating and reconstructions of palaeoenvironments.

Palynomorph: ancient terrestrial spores, pollen and aquatic algal cysts, studied by palynologists.

Paper shale: shales with particularly thin laminations.

Parallel bedding: see planar bedding.

Pareiasaur: an extinct group of reptiles that lived during Middle and Late Permian times.

Peat: a partially decomposed mass of vegetation, found in many bogs and marshes.

Pebble: a fragment of rock with a diameter of between 4 and 64 mm.

Pediment: a plain of eroded bedrock, occasionally covered by a thin layer of sediment, characteristic of sedimentary basins in arid and semi-arid areas.

Pedodiagenetic: diagenetic processes associated with the formation of soil profiles.

Pedogenic: processes relating to the development of soil profiles.

Pelycosaur: a group of carnivorous and herbivorous extinct reptiles, some of which had a large fin or sail on the back, which lived from Late Carboniferous to Early Permian times.

Penecontemporaneous: happening at almost the same time.

Period: a major division of geological time, of shorter duration than an era and itself divisible into epochs.

Permian Period: the period of geological time (cf. chronostratigraphy) ranging from 291 to 251 million years ago.

Petrography: the study of rocks in hand specimen and under the microscope.

Petrology: the study of rocks.

Phosgenite: a rare mineral composed primarily of lead ($\text{Pb}_2(\text{CO}_3)\text{Cl}_2$).

Phosphate: a chemical salt containing phosphorus. Calcium phosphate is, a mineral frequently associated with the preservation of bones and shells.

Phosphatic: rocks containing large quantities of phosphate.

Phosphatize: the process of becoming enriched with phosphate.

Phyllopod: see branchiopod crustacean.

Phytoplankton: plant plankton.

Piedmont: the gentle slope between the steep mountain slopes and gentle plain.

Pisoids: large oolites, with a diameter of between 3 and 6 mm.

Pisolitic: descriptive of rocks that contain many pisoids.

Pitchstone: a glassy igneous rock with a dull surface and flat fracture surfaces.

Plagioclase: a type of feldspar.

Planar cross-bedding: a type of cross-bedding in which the lower surfaces of the sediment layers, deposited by a current, are flat surfaces of erosion, parallel to each other.

Plankton: aquatic micro-organisms that drift about in the water column.

Playa lake: shallow lakes that tend to dry out regularly, the underlying and resulting sediments frequently contain large quantities of evaporite minerals.

Plesiosaur: extinct marine reptiles with long necks that lived during the Mesozoic Era.

Polymodal: a distribution with many peaks, for example a sample of sediment with many grain size categories.

Porcellanous: porcelain-like.

Porphyritic: porphyry-like.

Porphyry: a medium-grained igneous rock that contains large crystals of minerals such as feldspar.

Potassium feldspar: a type of feldspar rich in potassium.

Precipitation: the formation of minerals from chemical-laden waters.

Primary current lineation: laminations formed under high-energy conditions, characterized by low ridges only a few grains thick.

Procolophonid: a group of extinct reptiles that lived during the Permian and Triassic periods.

Prosauropod: a group of primitive, partially bipedal, sauropod-like dinosaurs.

Proximal: near the source.

Pseudomorph: a mineral crystal that has the shape of another type of mineral, for example formed as a result of dissolution of the original mineral and replacement.

Pyrite: iron sulphide (FeS_2), commonly preserving fossils and found scattered in some sedimentary rocks.

Pyroclastics: clastic rocks formed by volcanic eruptions.

Quartz: silicon dioxide (SiO_2), the most common mineral in the Earth's crust.

Quartz-feldspar-porphyry: a variety of porphyry rich in quartz and feldspar.

Quartzite: an arenaceous rock that is composed primarily of quartz.

Rain prints: small craters formed when rain drops hit unconsolidated sediments.

Raised beach: a shoreline elevated above the present levels either by a fall in sea level or by a relative positive movement of the land.

Rare Earth Elements (REE): the metallic elements with atomic numbers between 57 to 71, commonly used by geochemists to interpret geological processes.

Re-activation surface: erosion surfaces occurring within cross-bedded units caused by changes in direction of the currents.

Recumbent folds: fold structures that have been tilted or inclined.

Red Beds: sedimentary rocks, usually of continental origin, or derivation, with red colour reflecting a content of iron oxide; may have formed in arid conditions.

Reg: a desert characterized by bare stony surfaces.

Regression: the withdrawal of water (usually the sea) from a landmass.

Reptile: an animal that has scales and lays eggs, for example lizards, snakes and crocodiles.

Reworking: natural excavation (for example by rivers) of fossils from sediments, which are often reburied after further transportation; sediments may also be reworked.

Rhaetian Age: a geological time division (age, cf chronostratigraphy) part of the Late Triassic Epoch.

Rhizcretions: elongate, commonly vertical, concretions that form around the roots of plants, found in palaeosols.

Rhynchosaur: an extinct reptile group common in the Triassic period.

Rhyolite: a fine-grained or glassy volcanic rock.

Ripple: a small-scale undulation in sediment produced by the movement of air or water over the sediment surface.

Rip-up clasts: fragments of sediment that have been eroded from river banks and re-deposited in the succeeding sedimentary layers.

Roadian Age: geological time division (age; cf. chronostratigraphy), the first part of the Middle Permian Epoch.

Rudaceous: coarse-grained rocks, breccias and conglomerates.

Rutile: a mineral, TiO_2 , common in igneous rocks and found as thin threads in quartz crystals.

Sabkha: salt encrusted, supratidal or intertidal surfaces, or coastal flats bordering lagoons. Inland forms frequently support sand dunes.

Sakmarian Age: a geological time division (age; cf. chronostratigraphy); the second division in the Early Permian Epoch.

Sandflow lamination: see grainflow lamination.

Sandstone: a sedimentary rock composed of grains between 0.0625 mm and 2 mm in diameter.

Sanidine: a type of feldspar.

Satin spar: fibrous gypsum, usually forming veins.

Scatter bone bed: a bone bed characterized by scatters of vertebrate material throughout a mudstone unit.

Schist: a metamorphic rock characterized by a parallel alignment of the coarsely crystalline minerals.

Schorl: black tourmaline

Scolecodont: fossil polychaete worm jaw elements.

Scree: an accumulation of rock fragments formed by the mechanical weathering of outcrops. The rock debris generally forms cones or slopes beneath cliffs.

Scrin: very thin, often impersistent mineral veins.

Scythian Epoch: see Early Triassic Epoch.

Sediment: particles of pre-existing rock.

Sedimentary basin: a large-scale depression that acts as a focus for sediment accumulation.

Sedimentary log: a graphic or pictorial representation of a sedimentary sequence.

Sedimentary rock: a rock composed of sediments, deposited by wind, water or ice.

Sedimentology: the study of sediments and sedimentary rocks.

Seif dune: a knife-edged, longitudinal dune aligned parallel to prevailing wind direction.

Selenite: transparent plates of gypsum.

Septarian nodule: a nodule with an internal structure of mineral (for example calcite) veins, which produces a polygonal pattern of veins.

Series: a chronostratigraphical unit, of lesser extent than a system, but itself divisible into stages.

Serir: desert plain strewn with rounded pebbles.

Set: an individual bed of cross-bedded sediment.

Shale: very fine-grained rocks that split along well-developed thin layers.

Sheet flood: the surface movement of thin sheets of water.

Sheeting: a weathering process that produces thin layers of the parent rock aligned parallel to the ancient land surface under arid conditions. It is seen commonly in modern deserts.

Shelf: the area between dry land and the deep ocean.

Silica: silicon dioxide (SiO_2), also known as quartz.

Siliceous: composed of silica or silica rich.

Silcrete: a palaeosol rich in silica.

Sill: horizontal sheets of intrusive igneous rocks.

Silt: a fine-grained sedimentary rock, between clay (0.0039 mm) and sand (0.0625 mm) in grain size.

Siltstone: a rock made of silt.

Silurian Period: a geological time division (period, cf. chronostratigraphy) ranging from 439 to 408 million years ago.

Slickensided: descriptive of a rock that displays a polish and linear grooves and ridges produced when two surfaces move past each other, commonly associated with faulting.

Slump: contorted structures produced by the mass-movement of unconsolidated sediments.

Smectite: a type of clay mineral.

Soft sediment deformation: deformation of sediments before they have been lithified, caused by water loss or tectonic activity.

Sorting: the distribution of grain sizes. A well-sorted rock will have a narrow range of grain sizes.

Sperry: crystalline.

Sphenodontian: a primitive, lizard-like reptile. The *Tuatara* from New Zealand is the only living representative of this group.

Sphalerite: the main ore of zinc (ZnS). Often found associated with galena.

Spherulitic: globular masses of needle-like crystals, which are generally arranged in radiating patterns.

Stage: a chronostratigraphical unit, usually taken to be the smallest standard unit.

Star dune: a sand dune with a complex star-shaped morphology.

Stratified: layered.

Stratigraphy: the study of the temporal and spatial relationships between strata.

Stratotype: the type section of a stratigraphical unit.

Stratum (pl. strata): a bed, or single layer, of a sedimentary rock.

Striated: ornamented with linear ridges or scratches.

Stringers: very thin veins or beds, often laterally impersistent.

Stromatolite: layers of blue-green algae and sediment, which grow upwards, producing domal structures.

Stylolite: an irregular suture formed in limestone and some evaporites due to high pressures dissolving the calcium carbonate rock on a large scale. A diagenetic feature, marked by thin layers of insoluble material.

Sub-tidal: below the tides.

Succession: a sequence of strata; a younger bed succeeds an older one in a continuous succession.

Sun crack: cracks formed when wet sediment dries out.

Supersaline: see hypersaline.

Supratidal: above the tides.

Swash: the movement of water up a beach after a wave breaks.

Synsedimentary deformation: deformation of sediments that occurs while the sediments are being deposited.

System: a chronostratigraphical unit, made up of series.

Tabular cross-bedding: cross-bedding characterized by flat angled surfaces within the bed.

Talus: an alternative name for scree.

Taphonomy: in palaeontology, the study of the changes that affect organisms after death and during their transfer to the fossil record, including the physical and chemical interactions that affect the organism from burial to discovery as a fossil.

Tap root: the major, often longest, root of a plant growing downwards from the stem.

Tectonic: an adjective used to relate a phenomenon to a structural concept, often associated with large-scale earth movements.

Temnospondyl: an extinct group of amphibians that lived from Carboniferous to Early Jurassic times.

Theropod: a group of bipedal carnivorous dinosaurs, for example *Tyrannosaurus rex*.

Throw: the amount of movement on a fault.

Thrust fault: a fault characterized by movement of rocks under lateral compression along a low angle fault plane.

Tourmaline: a complex silica-rich mineral.

Trace bone bed: thin, often single layers of grains and patches of vertebrate material.

Trace fossil: sedimentary structures produced by biological activity, for example burrows and footprints.

Trackway: a connected series of footprints.

Transgression: the inundation of a landmass by a body of water, usually the sea.

Triassic Period: a geological time division (period, cf. chronostratigraphy) ranging from 251 to 199 million years ago, the first part of the Mesozoic Era. It is preceded by the Permian Period.

Tridactyl: with three toes.

Tritylodont: an extinct terrestrial reptile.

Trough cross-bedding: cross-bedding characterized by trough-shaped surfaces within the bed.

Tuff: igneous rocks formed by explosive volcanism.

Type section/locality: the sedimentary rock succession or locality used to define an interval or point in geological time.

Unconformity: a break in the relationship between successive strata resulting from a lack of deposition during an intervening phase of tectonism and erosion; the unrepresented time interval may be substantial and there is often an angular discordance in the layers either side of the unconformity surface.

Uni-modal: a distribution with one peak, for example a sample of sediment with one dominant grain size.

Upper stage plane beds: thin laminations deposited under high-energy flow conditions.

Uplthrow: upwards vertical movement associated with a fault.

Vadose: descriptive of the water below the ground surface, but above the water table.

Vein: thin sheets of minerals cutting through rocks.

Vein quartz: opaque white quartz formed in veins.

Ventifact: fragment of stone abraded by the wind into a characteristic shape. See dreikanter.

Vermiculite: a group of layered minerals.

Volcanic: igneous rocks formed when volcanoes erupt (e.g. lava).

Vug: a cavity in a rock that may be partially or totally infilled with minerals.

Wadi: a gorge-like valley formed in arid or semiarid environments.

Watertable: the upper limit of groundwater.

Wave-cut platform: a smooth rock 'bench' along a coast produced by ocean waves cutting landwards.

Wavy bedding: thin cross-laminated beds that alternate with mudstone.

Weathering: the breaking down of rocks through the effects of exposure to the weather; the term does not infer any transportation of the weathered rock material.

Winnowed lag: a concentration of coarse-grained sediments produced when a current of wind or air removes the finer-grained component.

Wordian Age: a geological time division (age; cf. chronostratigraphy), the middle part of the Middle Permian Epoch.

Wuchiapingian Age: a geological time division (age; cf. chronostratigraphy), the first part of the Late Permian Epoch.

[References](#)