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## Glossary

This glossary aims to provide simple explanations of all but the most elementary geological terms used in Chapter 1 and the 'Introduction' and 'Conclusions' sections of site descriptions. It also includes many of the more important terms encountered in other sections of the volume. Detailed stratigraphical terms are omitted, since they are given context within the figures and tables. *The explanations are not intended to be comprehensive definitions, but concentrate instead on the way in which the terms are used in this volume.*

**Aalenian Stage:** a chronostratigraphical subdivision of the Jurassic System; the rocks deposited during the Aalenian Age. It is preceded by the Toarcian Stage and followed by the Bajocian Stage.

**Age:** a geological time unit of shorter duration than an epoch; the time equivalent of a stage in the hierarchy of chronostratigraphical terms. Subdivided into Early, Mid and Late as appropriate.

**Algal limestone:** a build up of carbonate sediments with a significant contribution from marine algae that secrete or promote the deposition of calcium carbonate.

**Allochthonous:** descriptive of fossils or rocks which lived or formed somewhere other than in their current position and which were subsequently transported.

**Alluvial:** a term applied to the environments, action and products of rivers or streams. Alluvial deposits are composed of clastic material deposited on the river floodplain.

**Ammonite:** a Mesozoic cephalopod typically characterized by a coiled, chambered shell; an extinct relative of modern squid and cuttlefish.

**Anaerobic:** descriptive of an environment in which air (oxygen) is absent.

**Angiosperm:** a flowering plant or tree that develops seeds within a fruit.

**Ankylosaur:** a strongly armoured, herbivorous, quadrupedal dinosaur with a clubbed tail.

**Annelid:** any member of the Phylum Annelida, a major invertebrate group comprising segmented worms such as modern earthworms and leeches; in the fossil record, usually preserved only as trace fossils because they have almost no hard parts.

**Anoxic:** literally 'without oxygen'; often used to describe an anaerobic environment.

**Anticline:** an arch-shaped upfold of rocks produced by tectonic activity with younger strata on the outermost part of the arch and older rock in the core.

**Aragonite:** a form of calcium carbonate, distinguished from calcite by a different crystal structure. The shells of some molluscs are composed largely of aragonite.

**Arenite (adj. arenaceous):** a general term for a detrital, clastic sedimentary rock made of sand-sized particles.

**Argillite (adj. argillaceous):** a general term for a fine-grained, clay-rich, clastic sedimentary rock.

**Arthropod:** an invertebrate animal characterized by a segmented body and paired antennae, wings or legs; for example, insects, crustaceans and arachnids.

**Asteroidea (asteroids):** a class of echinoderms commonly known as 'starfish' and characterized by their star shape and five 'arms'.

**Authigenic:** descriptive of a mineral formed within a sediment or rock either by replacing or displacing an earlier mineral.

**Autochthonous:** descriptive of a fossil or rock that lived or formed in its current position.

**Auxilliary Stratotype Point:** a particular position in a sequence of sedimentary rocks proposed in addition to the stratotype in order to extend knowledge of the unit or boundary to other geographical areas.

**Avialan:** bird-related.

**Bajocian Stage:** a chronostratigraphical subdivision of the Jurassic System; the rocks deposited during the Bajocian Age. It is preceded by the Aalenian Stage and followed by the Bathonian Stage.

**Bathonian Stage:** a chronostratigraphical subdivision of the Jurassic System; the rocks deposited during the Bathonian Age. It is preceded by the Bajocian Stage and followed by the Callovian Stage.

**Bed:** in lithostratigraphy, a subdivision of either a member or a formation; the smallest unit within the scheme of formal lithostratigraphical classification. Also used informally to indicate a stratum within a sedimentary rock succession.

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

**Belemnite:** a member of an extinct group of marine cephalopod molluscs characterized by a bullet-shaped internal shell of calcium carbonate.

**Bennetiales:** an extinct group of gymnosperm plants that grew to about 2 metres in height.

**Benthos (adj. benthic):** aquatic organisms living on or in the sea floor.

**Bentonite:** a deposit of clay formed by the alteration of glassy volcanic ash.

**Berthierine:** an iron-rich silicate mineral of the serpentine group; an important original constituent of certain Jurassic rocks.

**Bioclast (adj. bioclastic):** a sediment grain consisting of comminuted fossil remains.

**Bioerosion:** the erosion of consolidated material by biological processes.

**Biohorizon:** a bed or series of beds characterized by a particular fossil assemblage and within which no further stratigraphical refinement, on the basis of that contained fossil fauna, can be made.

**Biomicrite:** a limestone containing bioclasts in a carbonate mud matrix.

**Biopelmicrite:** a limestone similar to a biopelsparite but with a matrix composed of more microcrystalline calcite than calcite cement.

**Biopelsparite:** a limestone intermediate in content between a biosparite and a pelsparite.

**Biosparite:** a limestone containing bioclasts in a predominantly cementing matrix of crystalline calcite.

**Biostratigraphy (adj. biostratigraphical):** the stratigraphical subdivision, classification and correlation of sedimentary rocks based on their fossil content.

**Bioturbation:** the physical disturbance of unconsolidated sediment caused by the organisms living on or in it, such as by burrowing and feeding. In ancient sediments, these disturbances are often preserved as trace fossils.

**Biozone:** in biostratigraphy, a restricted unit of sedimentary rock defined by its fossil content, most usefully by species of narrowly defined temporal, but wide spatial, range, and named after one or more abundant or characteristic species.

**Bitumen (adj. bituminous):** a group of naturally occurring hydrocarbons that are organic-soluble.

**Bivalve:** an aquatic mollusc characterized by bodies enclosed in two hinged, often mirror-image shells (valves). Modern examples include cockles and mussels.

**Brachiopod:** a marine shellfish superficially similar to bivalves but with a different anatomy and two hinged shells that are typically not mirror images of each other.

**Brackish:** descriptive of water with a salinity intermediate between fresh and marine.

**Breccia:** a sedimentary rock consisting predominantly of angular pebbles.

**Bryozoan:** a very small, moss-like, aquatic, colonial animal with a box-like skeleton of calcium carbonate.

**Cadicone:** a coiled, more-or-less evolute cephalopod shell with depressed whorls, wide venter and deep umbilicus.

**Calcarenite:** a sediment composed of sand-sized calcium carbonate grains. b: containing large quantities, or composed, of calcium carbonate.

**Calci-:** prefix indicating containing/composed of calcium carbonate.

**Calcite:** the most common, rock-forming, crystalline form of calcium carbonate; the main constituent of limestone and the shells of many molluscs, brachiopods, echinoderms and other invertebrates.

**Calcrete:** a 'fossil soil' cemented by calcium carbonate and indicative of arid or semi-arid environments.

**Caliche:** a soil horizon rich in nodular carbonate that forms in seasonally arid environments.

**Callovian Stage:** a chronostratigraphical subdivision of the Jurassic System; the rocks deposited during the Callovian Age. It is preceded by the Bathonian Stage and followed by the Oxfordian Stage.

**Carbonaceous:** containing carbon.

**Carbonate:** a mineral salt of carbonic acid; usually referring to the common sedimentary form of calcium carbonate in limestones and invertebrate shells, but also encompassing other minerals, notably dolomite (magnesium carbonate).

**Caytoniales:** a group of pteridosperm plants from the Mesozoic Era.

**Cement:** the mineral 'glue' that holds particles together in sedimentary rocks.

**Cephalopod:** a marine mollusc, such as modern squid, octopus and cuttlefish, and the extinct ammonite and belemnite.

**Chalk:** a poorly lithified, porous, white limestone.

**Charophyte:** a single-celled, planktonic, plantlike organism.

**'Chedworth Bun':** a vernacular name for the echinoid *Nucleolites woodwardi* Wright.

**Chemostratigraphy:** the characterization and classification of rock sequences based on their chemistry.

**Chert:** cryptocrystalline silica (SiO<sub>2</sub>) occurring as layers or nodules in sedimentary rocks (mainly limestones).

**Chitin (adj. chitinous):** an organic compound, related to cellulose, which forms the hard outer shell of insects, crustaceans and other arthropods.

**Chorotype:** a fossil specimen from a neighbouring locality but the same stratigraphical level as that of the type specimen.

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

**Clast (adj. clastic):** a sedimentary particle — a fragment of a pre-existing rock or fossil (bioclast).

**Clay:** an extremely fine-grained sediment (grain-size less than 0.004 mm) composed of so-called 'clay minerals' (hydrated aluminium silicates with a layered crystal structure).

**Coccolith:** one of the interlocking calcite plates which form the sphere-shaped skeleton (coccosphere) of the coccolithophores (marine, microscopic, single-celled algae).

**Coelenterata:** a group of aquatic animals with radially symmetrical bodies, a sac-like internal cavity and stinging cells; modern examples include jellyfish, sea anemones and corals.

**Conch:** a common name for the shell of various marine invertebrates.

**Conchostraca:** freshwater crustaceans in which the body is contained within a chitinous, hinged shell.

**Concretion:** a rounded or irregular mass of mineral matter concentrated around a nucleus and formed during diagenesis in a sedimentary rock.

**Conglomerate:** a sedimentary rock consisting predominantly of rounded pebbles.

**Contemporaneous:** formed or occurring at the same time.

**Coprolite:** fossilized faeces.

**Coral:** an aquatic coelenterate animal typically with a calcium carbonate external skeleton. It may live as an individual or in large colonies.

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

**Cretaceous Period:** a geological time division ranging from about 65 to 145 million years ago. It is the last period of the Mesozoic Era.

**Crinoid:** an echinoderm with a flowering-plant-like structure, often called 'sea-lilies' or 'feather stars'. They may be sessile (with a stem) or free-floating.

**Cross-bedding, cross-lamination, cross-stratification:** subsidiary bedding surfaces oblique to the upper and lower bounding surfaces of a particular stratum and representing ripples or dunes formed in the sediment by water currents (or wind). Large-scale features are named 'cross-stratification', smaller-scale features are known as 'cross-bedding', and 'cross-lamination' is the finest-scale form.

**Crustacean:** a member of a group of mainly aquatic arthropods, including lobsters, shrimps, barnacles, wood lice and water fleas. They have two pairs of antennae, a pair of mandibles and often many other appendages.

**Cryptogalaminite:** descriptive of carbonate rocks displaying distinctive discontinuous, more or less planar laminations, believed to be caused by successive mats and films of algal matter.

**Cyanobacteria:** a group of bacteria, formerly known as 'blue-green algae', capable of photosynthesis.

**Cycad:** a gymnosperm plant (Order Cycadales) characterized by a palm-like appearance with massive stems, large pinnate leaves and sporophylls in cones.

**Cycadeoidales:** an extinct order of gymnosperm plants that were extant during the Mesozoic Era.

**Cycadophytes:** a collective term for the Cycadeoidales and Cycadales.

**Delta (adj. deltaic):** a tract of sediment, typically fan-shaped, deposited where a river enters a lake or the sea.

**Denudation:** the combined processes of weathering and erosion that wear down landscapes.

**Depocentre:** the centre of (greatest) deposition.

**Desiccation crack:** a crack formed when wet sediment contracts as it dries out.

**Diachronous:** descriptive of a contiguous rock body that was deposited at different times in different places so that it is not everywhere of the same age.

**Diagenesis (adj. diagenetic):** the post-depositional changes in mineralogy and texture of sediments and organisms that combine to produce rocks and fossils. The term excludes metamorphic alteration.

**Dinantian Stage:** a Palaeozoic chronostratigraphical division equivalent to the Lower Carboniferous Series in Europe.

**Dinoflagellate:** one of a large group of protozoans, consisting of microscopic single-celled, planktonic organisms that possess two flagella (tails) used in movement. Some cause red tides and some are bioluminescent.

**Dip:** the angle between a bedding surface and the horizontal.

**Disconformity:** a minor unconformity with minimal angular discordance.

**Dissolution:** the natural process of dissolving a solid; specifically in karst processes, the dissolving of carbonate rock to create a liquid solution of calcium and bicarbonate ions in water.

**Dogger:** a traditional term for a type of large concretion; also the name formerly used for the Middle Jurassic Series in continental Europe.

**Dolomite:** the mineral calcium-magnesium carbonate ( $\text{CaMg}(\text{CO}_3)_2$ ); more informally, a carbonate rock containing a substantial proportion of dolomite mineral, often as a result of post-depositional changes to limestones.

**Downthrow:** the amount of downward displacement of rock along a fault.

**Downwarp:** an area of large-scale downward bending in the Earth's crust.

**Drift:** rock material of Quaternary age, typically unconsolidated, encompassing materials such as alluvial and glacial deposits.

**Dyke:** a vertically orientated band of igneous rock which has 'intruded' or 'cut through' pre-existing rocks; dyke-like bodies of sedimentary rocks, infilling fissures in a host rock, are known as 'neptunian' dykes.

**Echinoderm:** one of a group of marine invertebrates characterized by a five-fold symmetry and generally a calcareous skeleton, including starfish, sea-urchins and crinoids.

**Echinoid:** a familiar name for a sea-urchin, one of the echinoderms; characterized by a rigid, globular or disc-shaped shell.

**Epifauna:** a collective term for the benthic organisms which live or lived on the substrate of the sea floor, or attached to some solid object.

**Epoch:** a geological time unit of shorter duration than a period and itself divisible into ages (e.g. the Mid Jurassic Epoch).

**Era:** a major unit of geological time; the geological record is divided into five such units the Archaean, Proterozoic, Palaeozoic, Mesozoic and Cainozoic. Each is composed of several periods.

**Erathem:** a major chronostratigraphical division which comprises all the rocks formed during an era.

**Erosion surface:** a land or rock surface shaped by the processes of erosion.

**Eupanothera:** a member of an extinct order of small therian mammals that lived from Mid Jurassic to Early Cretaceous times.

**Eustatic:** concerning world-wide (as distinct from local) changes in sea level which are caused by a major geological event such as tectonic activity or an ice-age.

**Evaporite:** a sediment or mineral precipitated from a saline solution as a result of evaporation. Common evaporite minerals are gypsum and rock salt.

**Event stratigraphy:** the correlation of sedimentary rocks by recognition of marker beds or event horizons which are considered to be isochronous.

**Evolute:** descriptive of a coiled shell that is loosely wound.

**Facies:** the sum total of a rock's lithological and gross faunal/floral characteristics that together reflect the particular environment in which it formed.

**False-bedding:** cross-bedding.

**Fan:** a cone-shaped sedimentary deposit.

**Fault:** a more-or-less major and approximately planar fracture surface in rock along which there has been some movement of one side relative to the other.

**Fauna (adj. faunal):** animals — often referring to the characteristic animal assemblage of a region/time period.

**Faunizone:** a body of strata characterized by a distinctive faunal assemblage.

**Ferroan:** descriptive of a mineral containing ferrous iron.

**Ferruginous:** containing iron or iron-rich minerals.

**Fissile:** descriptive of a sedimentary rock that contains very thin bedding or cleavage laminae along which the rock splits into thin sheets.

**Flaggy:** descriptive of a sedimentary rock that contains bedding between 0.01 and 0.10 m thick, along which the rock can be split into thick sheets (flagstones).

**Flora (adj. floral):** plants — often referring to the characteristic plant assemblage of a region/time period.

**Florule:** a collection of plant fossils that comes from a single stratum over a limited geographical area.

**Foraminifera:** small, single-celled aquatic animals that have a protective external shell of carbonate or other material. They are usually microscopic in size.

**Formation:** a succession of contiguous rock strata that is distinctive enough in its lithology from the surrounding rocks to be mapped as a unit; the fundamental unit of lithostratigraphy.

**Fossil:** the preserved remains of an animal or plant. Tracks, trails and burrows, formed by an organism within a sediment, are known as trace fossils.

**Freestone:** any stone (particularly limestone or sandstone) that can be cut easily in any direction.

**Friable:** descriptive of a rock that is crumbly or easily broken.

**Gall:** an intraformational clay/mudstone pebble.

**Gastropod:** one of a group of univalved molluscs characterized by helical shells made of aragonitic calcium carbonate, including snails and limpets.

**GCR:** Geological Conservation Review, in which nationally important geological and geomorphological sites were assessed and selected with a view to their long-term conservation as SSSIs.

**Ginkgo:** the sole surviving plant of the gymnosperm subclass Ginkgoales, native to China and today existing almost exclusively in cultivation only.

**Glauconite:** a green-blackish or yellowish mineral of the mica group that occurs as small granules in certain marine sedimentary rocks. It is sufficiently common in some shallow-water marine sediments to give them an overall green colouration.

**Graben:** a large block of the Earth's crust down-thrown between two parallel faults or fault systems to produce a rift or trough.

**Grainstone:** a carbonate rock or limestone composed of grains in contact with one another and little or no supporting matrix.

**Group:** in lithostratigraphy, a grouping of two or more formations with significant unifying lithological and/or genetic features.

**Growth fault:** a fault in a sedimentary rock that develops contemporaneously and continuously with deposition.

**GSSP (Global boundary Stratotype Section and Point):** an internationally recognized chronostratigraphical boundary established following strict procedures of the International Union of Geological Sciences Subcommittee on Stratigraphy.

**Gull:** a structure associated with superficial mass movement processes such as landslipping, consisting of wide fissures or joints which may be filled with debris.

**Gypsum:** a white or colourless calcium sulphate mineral ( $\text{CaSO}_4 \cdot 2\text{H}_2\text{O}$ ) often associated with evaporite deposits or formed by the oxidation of pyrite in the presence of calcium carbonate during weathering.

**Half graben:** an elongate trough bounded by a normal fault on one side only (see also graben).

**Hardground:** a bedding surface of rock formed by cementation of sediment soon after deposition whilst it was at or close to the sediment/water interface (the sea floor).

**Hemera (pl. hemerae):** an interval of geological time characterized by the maximum abundance of a named fossil.

**Holostei (adj. holostean):** a group of mainly extinct bony fishes; extant examples include the bowfin and gar pike.

**Holothurian:** a member of the echinoderm group Holothuroidea (sea cucumbers).

**Holotype:** the single specimen (the so-called 'type specimen') selected to epitomize a particular named species.

**Homogenetic:** having a common origin or descent.

**Horizon:** an informal term denoting a thin bed or plane within a succession of strata (*see also* biohorizon).

**Ichnogenus:** a named grouping of trace fossils whose similarity of form suggests that they were made by closely related organisms.

**Ichthyosaur:** an extinct marine reptile well adapted for swimming; it had a streamlined fish-shaped body, paddle-shaped limbs, and ranged from 1 to 10 m in length.

**Igneous rock:** a rock that has formed from the cooling of molten magma, either following volcanic activity or intrusive processes. It consists of interlocking crystals, the size of which depends on the rate of cooling of the magma.

**Imbrication:** a sedimentary fabric typically displaying elongate fragments that are aligned in a preferred angle to the bedding.

**Index fossil (or index species):** a particular fossil (or species) that gives its name to a biozone.

**Induration:** the process of compaction and cementation during which a soft sediment becomes a rock.

**Infauna:** a collective term for the organisms which live or lived below the sea floor, especially in burrows in soft sediments but also including some rock-boring organisms.

**Inlier:** an outcrop of older rocks surrounded, on a geological map, by younger rocks commonly exposed by erosion (*cf.* outlier).

**Intercalation:** layering within a sedimentary sequence wherein one body of rock is interbedded with another, different body of rock.

**Intraclast:** a fragment of rock derived from coeval parent material rather than an 'older' (extraformational) source.

**Intrusion (adj. intrusive):** an igneous rock that formed as a body intruded into other rocks below the Earth's surface.

**Involute:** descriptive of coiled shells that are tightly or closely wound.

**Ironshot:** descriptive of a rock that contains small granules or ooids of iron or iron ore (often haematite and limonite).

**Ironstone:** an iron-rich sedimentary rock.

**Isochronous:** occurring at the same time.

**Joint:** a fracture in a rock that exhibits no displacement across it (unlike a fault). May be caused by shrinkage of igneous rocks as they cool in the solid state or, in sedimentary rocks, by regional extension or compression caused by Earth movements.

**Jurassic Period:** a geological time division ranging from about 145 to 207 million years ago; it precedes the Cretaceous Period, and succeeds the Triassic Period.

**Jurassic System:** a chronostratigraphical unit comprising all the rocks deposited during the Jurassic Period.

**Karst:** descriptive of a distinctive terrain developed upon a soluble rock, typically limestone; characterized by caves, sinkholes and dry valleys.

**Lagoon:** an area of shallow, generally salt, water more or less cut off from the sea by a narrow bar of sediment.



**Lamella (pl. lamellae):** a thin layer.

**Lamina (pl. laminae, laminations):** the finest layer within a sedimentary rock, typically less than 10 mm thick.

**Lenticular bedding:** lens-shaped beds in a succession of sedimentary rocks.

**Lias:** a lithostratigraphical group of mainly Early Jurassic age.

**Limestone:** sedimentary rock composed of calcium carbonate, often partly derived from the shells of organisms.

**Limonite:** a group of brown or yellow-brown, naturally occurring, hydrous iron oxides. Commonly formed as alteration products of iron-bearing minerals.

**Lineation:** any linear feature that appears on the bedding or other surface of a rock. May be formed during deformation.

**Listric fault:** a fault with a curved surface that diminishes in dip with depth.

**Lithic:** relating to a rock clast found within a sedimentary rock.

**Lithification:** a general term used to describe the conversion of sediment into rock.

**Lithofacies:** a facies defined by sedimentary rock type (using, for example, colour, texture and mineral composition).

**Lithology (adj. lithological):** descriptive of the constitution of a sediment or other rock, including composition, texture, colour and hardness.

**Lithostratigraphy (adj. lithostratigraphical):** the organization and division of strata into mainly mappable rock units and their correlation, based entirely upon their lithological characteristics. Units are named according to their perceived rank in a formal hierarchy, namely Supergroup, Group, Formation, Member and Bed.

**Littoral:** descriptive of the zone between high-and low-water marks on a shoreline.

**Log:** a written or graphical record of a borehole or rock section.

**Lumachelle:** an accumulation of shells, commonly oysters, within a stratified rock.

**Macroconch:** the larger of two shell forms recognized in mature ammonites and believed to represent the female; characterized by relatively large adult size (cf. microconch) and a smooth body-chamber or one with modified shell ornament.

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

**Magnetostratigraphy:** the relative dating of strata based on the succession of reversals of the Earth's magnetic field as measured by palaeomagnetism.

**Marble:** a metamorphic rock consisting of calcite or dolomite; typically a metamorphosed limestone; in a Jurassic context, any vaguely ornamental limestone, particularly a hard shelly limestone.

**Marine regression:** the withdrawal of the sea from the land due to a fall in relative sea level.

**Marine transgression:** the encroachment of the sea on to the land due to a rise in relative sea level.

**Marker bed/horizon:** a bed or layer within a rock succession with distinctive, easily recognizable characteristics that allow it to be traced for long distances or to serve as a reference or datum, and thereby enabling correlation.

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

**Massive:** descriptive of a bed or layer of sedimentary rock with an apparently uniform structure and lacking bedding fabric or lamination etc.

**Matrix:** in a sedimentary rock, the 'background' sediment, usually fine-grained, in which larger grains are dispersed.

**Member:** in lithostratigraphy, a subdivision of a formation.

**Mesozoic Era:** a geological time division ranging from about 65 to 247 million years ago; it comprises the Triassic, Jurassic and Cretaceous periods.

**Metamorphism (adj. metamorphic):** the process of radical alteration of the mineralogical and/or physical nature of rocks as a result of pressure and/or temperature.

**Mica:** a group of silicate minerals with a layered crystal structure.

**Micrite:** a microcrystalline calcite; typically a lime mud.

**Microconch:** the smaller of two shell forms recognized in mature ammonites and believed to represent the male; characterized by relatively small adult size (cf. macroconch) and shell ornament persisting to the aperture, which itself is modified often with some form of shell extension.

**Microspar:** a mosaic of calcite or dolomite crystals in the 4–50 micron range.

**Middle Jurassic Epoch:** a geological time division; the middle part of the Jurassic Period consisting of the Aalenian, Bajocian, Bathonian and Callovian ages.

**Mineral:** a naturally occurring, usually inorganic, chemical compound or element which, in combinations, are the constituents of rocks.

**Miospore:** a general term for any fossil plant spore smaller than 0.2 mm.

**Mollusc:** any member of the Phylum Mollusca, a major group of invertebrates including some of the most important fossil-forming groups such as bivalves, cephalopods and gastropods.

**Mould:** the impression left by a fossil in its host rock.

**Mud:** a mixture of clay and silt.

**Mudrock/mudstone:** a fine-grained sedimentary rock; lithified mud.

**Nannoplankton:** microscopic plant plankton.

**Nautiloidea:** an almost extinct group of cephalopods with straight or coiled, chambered shells.

**Nekton (adj. nektonic):** those organisms that actively swim in water.

**Neotype:** a new or replacement type specimen of a species or subspecies taken from the original, defining locality and horizon.

**Nodule:** a small concretion, generally roughly spherical or ellipsoidal.

**Non-sequence:** a relatively minor break in the accumulation of sediment and therefore a gap in the sedimentary rock record.

**Ochreous:** containing ochre, a brownish-yellow iron oxide mineral (see limonite).

**Oncoid (oncolith):** a pisoid or pisolith of algal origin.

**Ooid (oolith):** a spherical/subspherical carbonate-coated, sedimentary particle, less than 2 mm in diameter.

**Oolite:** a rock, usually limestone, made up largely of ooids produced by accretion of carbonate around a nucleus.

**Oomicrite:** a limestone consisting predominantly of ooids and a matrix/cement consisting of more micrite than sparry calcite.

**Oosparite:** a limestone consisting predominantly of ooids and a matrix/cement consisting of more sparry calcite than micrite.

**Ophiuroid:** a member of the echinoderm group Ophiuroidea (brittle stars).

**Ornithopod:** a bipedal or quadrupedal, plant-eating, 'bird-hipped' dinosaur with a pair of openings in the skull immediately behind the eye-socket.

**Ossicle:** a small, bone-like structure, particularly the plates etc. that comprise the skeletons of echinoderms.

**Ostracod:** a minute aquatic crustacean with a two-valved shell.

**Otolith:** 'ear stone', a calcareous structure of fishes used in maintaining balance.

**Outlier:** an outcrop of younger rocks surrounded, on a geological map, by older rocks (cf. inlier).

**Overstep:** where successive layers of sedimentary strata extend progressively on to older strata and where the plane of unconformity represents a time gap.

**Oxfordian Stage:** a chronostratigraphical subdivision of the Jurassic System; the first (oldest) stage of the Upper Jurassic Series. The rocks deposited during the Oxfordian Age. It is preceded by the Callovian Stage.

**Packstone:** a sedimentary carbonate rock in which constituent grains are in contact, providing a self-supporting framework; carbonate mud fills the interstices.

**Palaeo-:** 'ancient'.

**Palaeontology:** the study of fossil fauna and flora including their evolution and reconstruction of pre-existing environments.

**Palaeozoic Era:** the first major division of geological time characterized by abundant life; precedes the Mesozoic Era.

**Palyno-:** prefix indicating 'pollen' or 'spores'.

**Palynology:** the study of pollen, spores and certain other, generally plant, microfossils such as dinoflagellate cysts, acritarchs and chitinozoans.

**Palynomorph:** any of the microscopic, acid-resistant, organic-walled bodies found in palynological preparations and studied in palynology.

**Paralic:** descriptive of the coastal zone.

**Patch reef:** an isolated reef or body of reef rock.

**Pedogenesis:** the origin and formation of soils.

**Pelagic:** referring to the open sea and particularly to the organisms that swim or float within the water column and which are largely independent of the seabed.

**Peloid:** a sand- to granule-sized grain of finely crystalline carbonate of any origin, including pellets and ooids.

**Pelsparite:** a limestone composed predominantly of carbonate pellets within a sparry calcite matrix/cement.

**Pericline:** a dome-shaped anticline.

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

**Permineralization:** the deposition of mineral matter within organic tissues, also sometimes called petrification.

**Petrography:** the study of the mineralogy, texture and systematic classification of rocks, especially through the examination of thin sections etc. under the microscope.

**Petrology:** the study of the composition, occurrence and origin of rocks.

**Phosphate:** a phosphorus-rich mineral.

**Photic zone:** the part of a water body in which there is enough sunlight for photosynthesis to occur.

**Phylogeny:** the evolutionary relationships and history of a species or group of organisms.

**Phytoplankton:** plant forms of plankton; often microscopic.

**Pisoid (pisolith):** a large ooid with a diameter of more than 2 mm.

**Plankton:** minute aquatic organisms that drift with water movement.

**Platform:** a stable area of continental crust, generally a tract of ancient basement rocks.

**Plesiosaur:** a predatory marine reptile of the Mesozoic Era, which had a long neck and a relatively small head, and swam with flipper-shaped limbs.

**Pliosaur:** a marine reptile of the Mesozoic Era, which had a short neck, and swam with flipper-shaped limbs.

**Pluton (adj. plutonic):** an intrusion of igneous rock emplaced at depth in the Earth's crust.

**Porcellanous:** descriptive of a rock with fine-grained, uniform, porcelain-like texture.

**Pterosaur:** a flying reptile of the Jurassic and Cretaceous periods characterized by a membranous wing supported by an elongate fourth finger.

**Pyrite:** a widespread, naturally occurring iron sulphide mineral ( $\text{FeS}_2$ ) which often results from the biochemical action of bacteria within anaerobic environments.

**Quartz:** a rock-forming mineral composed entirely of silica ( $\text{SiO}_2$ ); one of the most common minerals in the Earth's crust.

**Quaternary Period:** a geological time division covering about the last 2 million years of Earth history; the exact age and definition of when the period starts is a matter of controversy.

**Ragstone (Rag):** an archaic term for a hard, coarse, rubbly or shelly rock (usually limestone) that weathers to produce a rough, irregular surface.

**Reef:** a marine sedimentary, usually calcareous, mound-like structure built up predominantly by the shells and skeletons of invertebrates such as corals, bryozoans and algae that lived in shallow, warm shelf seas.

**Regression:** see marine regression.

**Reworking:** the natural excavation and transportation of sediment or fossil material that is then redeposited elsewhere.

**Sand:** sediment particles typically between 0.0625 mm and 2 mm in diameter.

**Sauropod:** a typically very large and bulky, quadrupedal, plant-eating dinosaur with a small head, and long neck and tail. Examples include *Cetiosaurus* and *Diplodocus*.

**Scarp:** a steep or cliff-like slope, rising above the surrounding land; typically produced by the outcrop of a relatively hard unit of rock.

**Seatearth:** a bed of rock that underlies a coal seam and represents an old soil.

**Sediment:** granular material such as sand or mud derived from the weathering and erosion of pre-existing rocks, or from biological activity (e.g. shells and organic matter), or from chemical precipitation (e.g. evaporites).

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

**Sedimentology:** the study of sediments and sedimentary rocks, including their deposition, structure and composition.

**Selenite:** a colourless, transparent crystalline form of gypsum.

**Septarium (pl. septaria):** a large spheroidal concretion commonly of argillaceous limestone; characterized by a network of cracks which are often filled with crystalline minerals.

**Septarian:** descriptive of the irregular polygonal pattern of internal cracks developed in septaria, resembling desiccation cracks found in muds.

**Series:** a chronostratigraphical division; it comprises all the rocks formed during an epoch and can be divided into stages.

**Serpenticone:** an evolute, many whorled cephalopod shell, where the whorls barely overlap to resemble a coiled snake.

**Serpulids:** small, calcareous, tubular fossils believed to be ancestors of modern marine annelids (polychaete worms).

**Sessile:** 'attached'; applied to an organism that remains in one place during adult life.

**Set:** an individual bed of a cross-bedded body of sediment. They are termed 'bottomset', 'foreset' or 'topset' depending on their position within the cross-bedded sediment and, in combination, they are referred to as a 'co-set'.

**Shale:** a mudrock that splits easily into thin layers.

**Shatter belt:** a belt of rock typified by fissures or cracks that form a network of veins that may be filled by mineral deposits.

**Shingle:** well-rounded pebbles, typically up to about 75 mm diameter, especially those on a sea-shore.

**Siderite:** a brownish-, greenish- or yellowish-grey iron carbonate mineral that occurs as rhombohedral crystals or in a massive form. It occurs widely in sedimentary, particularly argillaceous, rocks, notably as concretions.

**Siliciclastic:** descriptive of a sediment or sedimentary rock comprising a high proportion of silica-rich grains or clasts.

**Sill:** a tabular body of igneous rock that is more-or-less concordant with the bedding or foliation of the host rocks.

**Silt:** a fine-grained sediment intermediate in grain size between clay and sand.

**Slate:** in a Jurassic context, any rock that splits easily into thin layers to make 'tiles' suitable for roofing.

**Slickensides:** parallel scratch marks or striations made on a joint or fault surface by the relative movement of one rock body against another.

**Slump:** a contorted-bedding structure produced by the mass-movement of unconsolidated sediments.

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

**Sparite:** the coarsely crystalline interstitial carbonate cement of limestones generally composed of calcite, formed during the transformation of the sediment into a limestone.

**Sparry calcite:** descriptive of calcite that occurs as clear, coarse-grained crystals.

**Sphaero-:** prefix meaning 'round' or 'spheroidal'.

**Sphaerocone:** an involute cephalopod shell, with depressed whorls (i.e. whorl height less than whorl width).

**Sphaerosiderite:** a variety of siderite that occurs as tiny globular grains usually in a clayey matrix. A common component in argillaceous seatearths.

**Sponge:** a primitive multicellular aquatic animal which secretes a skeleton of either silica, calcium carbonate or an organic material.

**SSSI:** Site of Special Scientific Interest; the designation of an area of land for statutory protection under the *Wildlife and Countryside Act 1981*.

**Stage:** a chronostratigraphical division; it comprises all the rocks formed during an Age, and is usually taken to be the smallest standard unit in the chronostratigraphical hierarchy.

**Staurolite:** a reddish-brown to black silicate mineral occurring mainly as twinned prismatic crystals and found frequently in metamorphic rocks.

**Stegosaur:** a large, quadrupedal, 'bird-hipped' dinosaur, characterized by a row of plates or spines along the neck, back and tail.

**Steneosaur:** a member of an extinct group of Jurassic to Early Cretaceous marine crocodiles.

**Stratigraphy:** the study of the temporal and spatial relationships within a rock succession.

**Stratotype:** a sequence of sedimentary rocks at a particular locality chosen as the standard against which other sequences can be compared. Stratotypes are established for lithostratigraphical and biostratigraphical units, both regionally and internationally.

**Stratum (pl. strata):** a bed or single layer in a succession of rock.

**Strike:** the trend of a geological surface (such as a bedding plane) measured at right angles to the direction of maximum slope or dip.

**Strike-slip:** a tectonic break in strata in which the predominant displacement is lateral rather than vertical.

**Stromatolite:** a laminated, mounded structure composed of limestone built by cyano-bacteria. They are known in rocks throughout the geological record; today, they develop in warm, shallow tropical seas.

**Subboreal:** pertaining to a Jurassic faunal province covering areas including southern England, northern France, northern Germany, parts of Poland and Russia west of the Urals.

**Subsidence:** a sinking of a local or regional portion of the Earth's surface with respect to its surroundings.

**Syncline:** a downfold of rock produced by tectonic deformation; the youngest rocks occur in its core.

**Syn-:** prefix indicating 'the same as' or 'resembling'.

**System:** a chronostratigraphical division comprising all the rocks formed during a period; can be divided into stages.

**Talus:** an accumulation of coarse rock-litter derived from, and accumulated at the foot of, a slope.

**Taphonomy:** in palaeontology, the study of the changes, including transportation, that affect organisms after death, including the physical and chemical interactions that take place between burial of the organism and its subsequent discovery as a fossil.

**Tectonism (adj. tectonic):** deformation of the Earth's crust and the consequent structural effects (e.g. faults).

**Teleosaur:** a member of an extinct group of Jurassic to Early Cretaceous marine crocodiles.

**Teleost:** a member of a major group of advanced fishes known in the Mesozoic Era and including most living bony fishes.

**Terrigenous:** derived from the land.

**Tethyan:** pertaining to the Tethys Ocean, which in the Mesozoic Era, centred around the modern Mediterranean.

**Theropod:** a bipedal, largely carnivorous, lizard-hipped' dinosaur.

**Throw:** the amount of vertical displacement between the rocks on either side of a fault.

**Thestone:** a traditional term for a flagstone (see flaggy) used for roofing.

**Trace fossil:** a structure in a sedimentary rock produced by biological activity, e.g. burrows and footprints.

**Transgression:** see marine transgression.

**Travertine:** a calcareous mineral deposited by flowing water, commonly where plants or algae promote carbonate precipitation by extracting carbon dioxide from the water; see also tufa.

**Triassic Period:** a geological time division ranging from about 207 to 247 million years ago. It is the first period of the Mesozoic Era, and is preceded by the Permian Period.

**Tripartite:** consisting of three parts, or divided into three sections.

**Trophic:** concerning nutrition and feeding.

**Trophic nucleus:** the numerically dominant species that makes up 80% of a faunal assemblage.

**Truncation:** the cutting or breaking off of the top of a geological structure or landform.

**Tufa:** a soft, porous sedimentary rock of calcium carbonate formed by evaporation or precipitated by algae and bacteria. Travertine is the hard, dense equivalent.

**Type locality:** the place where the type section (or stratotype) for a stratigraphical unit is located, or from where the type specimen of a fossil came.

**Type section:** see stratotype.

**Type specimen:** a single specimen designated as typifying a named species or subspecies.

**Unconformity:** an erosion surface between two sedimentary rock sequences of substantially different ages; there is often an angular discordance between the two sequences.

**Upper Jurassic Series:** a chronostratigraphical unit; the youngest series of the Jurassic System, followed by the Cretaceous System. It is divided into the Oxfordian, Kimmeridgian and Portlandian stages.

**Upthrow:** the amount of upward displacement of rock along a fault.

**Vein:** a fissure infilled with a mineral deposit cutting through a rock.

**Vesulian:** an obsolete stage name once used for the Upper Bajocian.

**Volcanic rock:** an igneous rock formed from the products of a volcanic eruption.

**Volcanogenic:** a general term applicable to rock sequences, individual rocks or constituents thereof that have originated from volcanic processes.

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

**Wackestone:** a carbonate rock with up to 50% of large grains dispersed in a carbonate mud matrix.

**Weathering:** the chemical alteration and physical breaking down of rocks through the effects of exposure to the weather.

**Whorl:** one of the 360° coils of a shell such as those of cephalopods, gastropods and foraminifera.

**Winnowing:** the selective sorting or removal of fine-grained particles by the action of water currents or wind, leaving coarser-grained material behind.

**Xeromorphic:** descriptive of plant forms that are adapted for an arid environment.

**Zone:** a stratigraphical unit in many categories of stratigraphical classification. In chronostratigraphy, a division smaller than a stage, defined by its base in a type section. In biostratigraphy, see biozone.

## [References](#)