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gage well. A stilling well in which stage measurements are performed^[16].

gage station. The point at which stage measurements are performed^[16].

gaining stream. A stream or reach of a stream whose flow is being increased by inflow of ground water^[22].

galena. A cave mineral — PbS^[11].

gallery. A rather large, nearly horizontal passage in a cave^[10].

galvanometer. A sensitive current meter^[16].

gardening. Clearing stones or other loose material from a route, usually a pitch, which might otherwise be dangerous to a caver continuing^[25].

gas-expansion method. The measurement of porosity based on the Boyle-Mariotte's gas laws^[16].

geo. See blowhole.

geode. Hollow globular bodies varying in size from a few centimeters to several decimeters, coated on the interior with crystals^[10].

geochemistry. The science of the qualitative and quantitative identification of the elements and their distribution in the earth^[16].

geodesy. The science of measuring the geometrical properties of the earth^[16].

geohydrologic system. The geohydrologic units within a geologic setting, including any recharge, discharge, interconnections between units, and any natural or man-induced processes or events that could affect ground-water flow within or among those units^[22]. See also ground-water system.

geohydrologic unit. An aquifer, a confining unit or a combination of aquifers and confining units comprising a framework for a reasonably distinct geohydrologic system^[22].

geohydrology. The branch of hydrology relating to the quantitative treatment of ground-water occurrence and flow^[16].

geological column. A vertical cross section through a sequence of formations^[16].

geological map. A map on which is recorded geologic information, such as the distribution, nature, and age relationships of rock units (surficial deposits may or may not be mapped separately), and the occurrence of structural features (folds, faults, joints), mineral deposits, and fossil localities. It may indicate geologic structure by means of formational outcrop patterns, by conventional symbols giving the direction and amount of dip at certain points, or by structure-contour lines^[1].

geological organ. A cylindrical or funnel-shaped cavity in relatively soluble bedrock which typically has a vertical orientation and is partly or wholly filled with material similar to the overlying sediment cover. They are produced by solution of bedrock and concomitant

subsidence of its sedimentary cover. Most have a diameter of 25 cm to 7 m and a depth of 2 to 30 m, but some may be much larger. A depth/diameter ratio of 5 to 20 may be considered representative. In actuality, geological organs are a type of subsidence doline that develops under a cover of younger rock or sediment^[17].
Synonyms: (French.) *Orgue géologique, poche de dissolution, puits naturel*; (Belgian.) *abannet, cavité de dissolution*; (German.) *geologische Orgel, Orgel, unterirdische Doline, Verwitterungssacke, natürlicher Schacht, Erdorgel, Erdpfeife, Riesentoph, Bodenkarren*, (British.) *sand pipe, sand-gall, gravel-pipe, pipe, pocket deposit, gull*; (Italian.) *organo geologico*; (Roumanian.) *orgile geologice*; (Czech.) *geologické varhany*; (Polish.) *organy geologiczne*; (Russian.) *organ truba, kamin*; (Serbo-Croatian.) *geološke orgulje*; (Slavic) *geološke orglje, zapolvje jaški*; (Dutch.) *geologische orgelpijp, aardpijp*.

geological section. A vertical section through a sequence of rock masses or strata^[16].

geologic control. The influence of geologic factors on hydrogeologic features^[16].

geologic correlation. The correlation of geologic formations as shown in geologic logs over a given area^[16].

geologic hazard. A naturally occurring or man-made geologic condition or phenomenon that presents a risk or is a potential danger to life and property. Examples include landsliding, flooding, earthquakes, ground subsidence, coastal and beach erosion, faulting, dam leakage

and failure, mining disasters, pollution and waste disposal, and seawater intrusion^[1].

geologic log. A vertical cross section of the lithologic column indicating geologic and petrographic data^[16].

geologic similarity. A model-prototype length ratio^[16].

geology. The study of the planet Earth—the materials of which it is made, the processes that act on these materials, the products formed, and the history of the planet and its life forms since its origin. Geology considers the physical forces that act on the Earth, the chemistry of its constituent materials, and the biology of its past inhabitants as revealed by fossils. Clues on the origin of the planet are sought in a study of the Moon and other extraterrestrial bodies. The knowledge thus obtained is placed in the service of man—to aid in discovery of minerals and fuels of value in the Earth's crust, to identify geologically stable sites for major structures, and to provide foreknowledge of some of the dangers associated with the mobile forces of a dynamic Earth^[1].

geomorphic process. The process responsible for the formation and alteration of the earth's surface^[16].

geomorphology. The science of the origin and evolution of land forms^[16].

gestation. The gestation phase of speleogenesis follows the inception phase, and the two in combination are essentially equivalent to the more commonly used term 'initiation'. The

transition from inception to gestation may correspond to the establishment of gravitational laminar flow conditions, and gestation is complete when turbulent flow is achieved^[9].

Ghyben-Herzberg conditions. Equilibrium condition at the interface of immiscible freshwater bodies and saltwater bodies in coastal aquifers^[16].

gibbs. An ascender with its cam operated by the weight of the caver^[25].

glacial deposit. Sedimentary deposits due to transport by glaciers^[16].

glacial drift. Sediment material contained, transported, and deposited by glaciers^[16].

glacial groove. A groove cut into bedrock by rock fragments at the bottom of a moving glacier^[16].

glacial till. An unsorted mixture of glacial drift^[16]. Synonym: boulder clay; till.

glaciation. A covering of the land surface by glacier ice^[16].

glacier. An extensive body of ice covering the land surface^[16].

glacier cave. 1. A cave carved out of the ice inside a glacier, not to be confused with an ice cave. Passages are formed by meltwater descending from the glacier surface via crevasses, or by melting on the glacier base. Through caves may connect sinkholes (sometimes called moulins) to glacier snout resurgences, but due to ice movement most glacier caves

are ephemeral. The most extensively explored glacier caves were the Paradise Caves on Mount Rainier, USA, whose passages extended for many kilometers, before the glacier wasted away and the caves were destroyed^[9]. 2. Cave in ice formed within or at the base of a glacier^[10].

glaciofluvial. Pertaining to the meltwater streams flowing from wasting glacier ice and especially to the deposits and landforms produced by such streams^[6].

glaciokarst. 1. A karst landscape that was glaciated during the cold periods of the Pleistocene and displays major landforms of relict glacial origin. Bare rock scars, locally with glacial striations, and limestone pavements are characteristic, due to the lack of rapid soil formation on the limestones since glacial stripping. Dolines within a glaciokarst are mostly small and immature, as are caves, except where pre-glacial passages are intercepted. Glaciokarst is almost synonymous with alpine karst, and some of the finest is developed on the high plateaus of the Calcareous Alps, south of Salzburg, Austria^[9]. 2. A glaciated limestone region possessing both glacial and karst characteristics^[10]. (French.) *karst glaciaire*; (German.) *Gebiet mit karst und Glazial-Formen*; (Greek.) *pagheto-karst*; (Spanish.) *glaciokarst*; (Turkish.) *buzul karstı*; (Yugoslavian.) *glaciokr̄s glaciokras, glaciokarst*. See also *alpine karst; nival karst*.

glade. 1. (Jamaican.) An elongate depression, having steep sides, in which a generally flat floor is divided into small basins separated by low divides. 2.

(Tennessee.) Limestone pavement having extensive growth of cedar trees^[10]. See also uvala.

globularite. Small crystals of calcite tipped with spheres composed of radiating fibers^[10].

gloop. Synonym for blow hole. Also spelled gloup.

goethite. A cave mineral — $\text{FeO}(\text{OH})$ ^[11].

golyĭ karst. (Russian.) See naked karst.

gooseneck. The part of a winding valley resembling in plan the curved neck of a goose. Normally found as part of an entrenched meander^[1].

gorge. A narrow passage or canyon in a mountain system^[16]. See also canyon.

gour. Flowstone deposit, normally of calcite, built up along the edge of a pool due to precipitation from a thin film of overflow water. Once initiated, by calcite-saturated water overflowing from floor hollows, development is self-enhancing, and the gours can grow into large dams many meters high and wide. Inside the gour pool, more calcite may be precipitated as crystals or pearls. Large flights of gours occur in many caves, with spectacular and well known examples around the Hall of Thirteen in the Gouffre Berger, France. Large travertine, gours can form in the open air, as at Band-i-Amir, Afghanistan^[9]. See also rimstone barrage; rimstone barrier; rimstone dam.

graben. A depression formed by a fault block moving downward on the two bounding faults^[16].

gradation. The leveling of a surface to a common level^[16].

grade. 1. Inclination or slope^[16]. 2. The class of a cave survey on the basis of the precision of the instruments and the accuracy of the methods^[25].

graded. An engineering term pertaining to a soil or an unconsolidated sediment consisting of particles of several or many sizes or having a uniform or equable distribution of particles from coarse to fine^[6].

gradient. The change in hydraulic head over some given distance (dh/dL) with ground-water flow usually occurring in the direction of decreasing hydraulic head which requires by convention, the attaching of a minus sign to any equation utilizing a gradient for flow. The maximum value of the directional derivative^[16].

grain packing. The spatial arrangement of grains forming porous medium^[16].

grain per gallon (gpg.) A common basis for reporting water analyses in the water-treatment industry in the United States and Canada. One grain per U.S. gallon equals 17.12 milligrams per liter^[6].

grain shape. The geometrical aspect of grains^[16].

granular. Of structure clearly showing grain shape^[16].

granule. Small rounded grain or rock fragment^[16].

grape formation. See botryoid.

gravel. Waterworn rounded rock grains and fragments^[16].

gravimetric moisture content. The ratio of water weight to the weight of solid particles^[16].

gravitational head. The component of total hydraulic head related to the position of a given mass of water relative to an arbitrary datum^[22].

gravitational water. Water which moves into, through, or out of the soil or rock mass under the influence of gravity^[22].

gravity component. The component acting in the direction of gravitation^[16].

gravity drainage. The flow of water towards a well under its own weight^[16].

gravity spring. See spring, gravity.

grid north. The direction of a north-south grid line on a map. Except for the north-south grid line through the point of origin of the grid, it will differ slightly from true north^[25].

grike. (British.) 1. A solutionally enlarged vertical or steeply inclined joint in the surface of a karstland, extending for up to a few meters into the limestone^[10]. 2. A vertical or sub-vertical cleft in a limestone pavement developed by solution along a joint or system of crisscrossing joints^[20]. Grikes separate

clints from one another. Synonyms: (British.) *gryke*; (French.) *lapiaz*; (German.) *Kluftkarren*. See also clint; bogaz; limestone pavement.

grotto. 1. Hole in small cave or cavern which has eroded in the wall of a main cave. 2. Widely open and shallow cave within a vaulted roof. 3. A cave or chamber preceded by a narrower passage^[20]. 4. A small cave, natural or artificial. 5. A room, in a cave system, of moderate dimensions but richly decorated^[10]. A grotto is often intricately decorated, and may occur above, at, or below sea-level^[20]. Synonyms: (French.) *grotte*, *baume*, *balme*; (German.) *Höhle*, *Grotte*; (Greek.) *speleon*; (Italian.) *grotta*; (Russian.) *grot*; (Spanish.) *gruta*; (Turkish.) *mağarauk*; (Yugoslavian.) *nis̃a*.

ground air. See soil air.

ground slope. The inclination of the land surface with the horizontal^[16].

ground water, phreatic water. 1. The part of the subsurface water that is in the phreatic zone^[10]. Its lower limits are the zone of rock flowage or the lowest fully confining bed; its upper limits are the uppermost fully confining bed or the water table^[16]. 2. Used loosely and incorrectly by some to refer to any water beneath the surface. See also phreas; phreatic water; phreatic zone.

ground-water artery. A tubular body of permeable water-filled material surrounded by confining beds^[16].

ground-water barrier. Rock or artificial material which has a relatively low permeability and which occurs below the land surface where it impedes the movement of ground water and consequently causes a pronounced difference in the potentiometric surface on opposite sides of it^[22].

ground-water basin. 1. A general term used to define a ground-water flow system that has defined boundaries and may include permeable materials that are capable of storing or furnishing a significant water supply; the basin includes both the surface area and the permeable materials beneath it^[22]. 2. The area throughout which ground water drains towards the same point; it can be larger than the accompanying surface water drainage basin if permeable layers extend outside of the topographic divide^[16]. See also drainage basin.

ground-water cascade. The flow of ground water over a subsurface barrier^[16].

ground-water cement. A cementing material precipitating at the water table^[16].

ground water, confined. Ground water under pressure significantly greater than atmospheric and whose upper limit is the bottom of a confining unit^[22]. See also confined; confining unit; confined aquifer.

ground-water dam. A geological stratum serving as a subsurface dam^[16].

ground-water discharge. 1. Flow of water from the zone of saturation^[22]. 2. The

water released from the zone of saturation^[22].

ground-water divide. 1. A ridge in the water table or other potentiometric surface from which ground water moves away in both directions normal to the ridge line^[22]. 2. A dividing line between two ground-water basins. 3. In well hydraulics, the streamline with no flow representing the boundary of the aquifer region contributing to well discharge^[16]. See also divide. Synonyms: divide; water-table divide.

ground-water flow. The movement of water in the zone of saturation^[22].

ground-water flux. The rate of ground-water flow per unit area of porous or fractured media measured perpendicular to the direction of flow^[22]. See also specific discharge.

ground-water inventory. The complete quantitative accounting for all volumes of ground water^[16].

ground-water mound. A raised area in a water table or other potentiometric surface created by ground-water recharge^[22].

ground water, perched. Unconfined ground water separated from an underlying body of ground water by an unsaturated zone. Its water table is a perched water table. Perched ground water is held up by a perching bed whose permeability is so low that water percolating downward through it is not able to bring water in the underlying

unsaturated zone above atmospheric pressure^[22]. See also perched ground water.

ground-water pumping. 1. Directed or oscillatory ground-water movement, along incipient fissures in the rock, that occurs due to very small but significant relative movements of the rocks themselves, maybe as a diurnal, tidal process. It may be one of the driving mechanisms of earliest, inception, phase of speleogenesis^[9]. The pumping of a water well to provide water for drinking, irrigation, and manufacturing, but may also be conducted for dewatering purposes.

ground-water recharge. The process of water addition to the saturated zone or the volume of water added by this process^[22].

ground-water reservoir. A reservoir in the void space beneath the water table^[16].

ground-water system. A ground-water reservoir and its contained water. Also, the collective hydrodynamical and geochemical processes at work in the reservoir^[22].

ground-water table. The surface between the zone of saturation and the zone of aeration. Also, the surface of an unconfined aquifer^[6]. Synonym: water table.

ground-water travel time. 1. The time-required for ground water to travel between two locations^[22]. 2. The time required for a unit volume of ground water to travel between two locations. The travel time is the length of the flow path divided by the velocity, where

velocity is the average ground-water flux passing through the cross-sectional area of the geologic medium through which flow occurs, perpendicular to the flow direction, divided by the effective porosity along the flow path. If discrete segments of the flow path have different hydrologic properties, the total travel time will be the sum of the travel times for each discrete segment^[22].

ground water, unconfined. Water in an aquifer that has a water table. Synonymous with phreatic ground water^[22].

grout. A fluid mixture of cement and water (neat cement) of a consistency that can be forced through a pipe and placed where required. Various additives, such as sand, bentonite, and hydrated lime may be included in the mixture to meet certain requirements. Bentonite and water are sometimes used for grout^[6].

grout curtain. The filling of void spaces in rocks to prevent the flow of water into and through the rock; most commonly associated with dams.

grouting. The operation by which grout is placed between the casing and the sides of a well bore to a predetermined height above the bottom of the well. This secures the casing in place and excludes water and other fluids from the well bore^[6].

grünkarst. See subsoil karst.

gryke. See grike.

guano. An accumulated deposit of animal excrement. In caves it is most commonly associated with bat colonies, but cave dwelling birds such as swifts may also contribute. Guano is only abundant in tropical regions and may be dry and powdery, or a foul, wet, sludge — as in the Niah Caves of Sarawak. It is a vital food source for many troglobites. Consisting mainly of phosphates and nitrate it is valued as a fertilizer or an ingredient of explosives and has commonly been mined. Over 100,000 tons of bat guano have been extracted from Carlsbad Caverns, USA^[9]. See also cave guano.

guano cave. A cave containing large amounts of guano^[13]. See also cave guano.

guanobia. An animal association feeding on guano. Not considered true cavernicoles as guano is not confined to caves.

gulf. Steep-walled closed depression having a flat alluviated bottom; in some gulfs a stream flows across the bottom^[10].

gull. A widened fissure formed by land slipping along valley sides, generally where massive beds such as limestone overlie weaker rocks^[9]. See also tectonic cave; windypit.

gully. A deep erosional channel^[16].

gushing spring. See spring, vauculian.

gypsum. 1. White or colorless mineral or rock composed of the hydrated calcium sulfate, $\text{CaSO}_4 \cdot 2\text{H}_2\text{O}$. Gypsum rock is an

evaporite precipitated from sea water and is therefore soluble in water and may contain dissolutional caves. Mineral gypsum is formed in some caves by reactions between the host limestone and sulfates (including sulphuric acid) derived from oxidized sulfide minerals (see pyrite). Gypsum, also referred to as selenite, commonly occurs as transparent crystals, blades, needles or fibres in cave clay deposits. A more spectacular form is as fibrous or curved crystals that may develop into cave flowers on cave walls and ceilings, as for example in parts of the Flint Mammoth Cave System, USA, or grow into large, hanging chandeliers, as in Lechuguilla Cave, New Mexico^[9]. 2. A mineral composed of hydrous calcium sulfate^[10], $\text{CaSO}_4 \cdot 2\text{H}_2\text{O}$.

gypsum cave. Both vadose and phreatic caves can form in gypsum, which is very soluble in water, but they are uncommon because gypsum rock rarely survives total dissolution in the near-surface environments associated with explorable caves. Gypsum caves certainly exist at depth within buried evaporate sequences. In areas of wet climate gypsum caves are generally seen only if encountered by man-made excavations. In contrast, gypsum caves are more common and more extensive in areas that have experienced a long period of dominantly arid climate. The most spectacular gypsum caves are in the Podolie region of the Ukraine, where joint guided maze-cave systems are very extensive — Optimisticeskaja has around 180km of passage^[9].

gypsum flower. See cave flower.

gypsum karst. A karst landscape developed on, or perhaps above, gypsum or similar evaporite rock sequences. Dissolution of gypsum by ground water in buried, interstratal, situations is common and the effects of such dissolution may be expressed at the land surface in the form of subsidence depressions. There are extensive areas of gypsum karst in North America and the Ukraine but British examples are limited to rare caves, exposed by quarrying, and subsidence depressions above dissolved gypsum beds, such as those around Ripon, Yorkshire^[9].

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<http://wasg.iinet.net.au/terminol.html>

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