

Study of Underground Rock Caves

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Abstract: A cave or cavern is a natural void in the ground, specifically a space large enough for a human to enter. Caves often form by the weathering of rock and often extend deep underground. The word cave can also refer to much smaller openings such as sea caves, rock shelters, and grottos, though strictly speaking a cave is exogene, meaning it is deeper than its opening is wide and rock shelter is endogen. Speleology is the science of exploration and study of all aspects of caves and the cave environment. Visiting or exploring caves for recreation may be called caving, potholing, or spelunking.

KEYWORDS: rock shelters, exogene, exploration, Speleology



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INTRODUCTION

Caves are found throughout the world, although the distribution of documented cave system is heavily skewed towards those countries where caving has been popular for many years (such as France, Italy, Australia, the UK, the United States, etc.). As a result, explored caves are found widely in Europe, Asia, North America and Oceania, but are sparse in South America, Africa, and Antarctica.

This is a rough generalization, as large expanses of North America and Asia contain no documented caves, whereas areas such as the Madagascar dry deciduous forests and parts of Brazil contain many documented caves. As the world's expanses of soluble bedrock are researched by cavers, the distribution of documented caves is likely to shift. For example, China, despite containing around half the world's exposed limestone—more than 1,000,000 square kilometers (390,000 sq mi)—has relatively few documented caves.

FORMATION TYPES

The formation and development of caves is known as speleogenesis. It can occur over the course of millions of years. Caves can range widely in size, and are formed by various geological processes. These may involve a combination of chemical processes, erosion by water, tectonic forces, microorganisms, pressure, and atmospheric influences. Isotopic dating techniques can be applied to cave sediments, to determine the timescale of the geological events which formed and shaped present-day caves.

It is estimated that a cave cannot be more than 3,000 meters (9,800 ft) vertically beneath the surface due to the pressure of overlying rocks. This does not, however, impose a maximum depth for a cave which is measured from its highest entrance to its lowest point, as the amount of rock above the lowest point is dependent on the topography of the landscape above it. For karst caves the maximum depth is determined on the basis of the lower limit of karst forming processes, coinciding with the base of the soluble carbonate rocks. Most caves are formed in limestone by dissolution.

Caves can be classified in various other ways as well, including a contrast between active and relict: active caves have water flowing through them; relict caves do not, though water may be retained in them.

Types of active caves include inflow caves outflow caves and through cave.

Solutional cave:

Solutional caves or karst caves are the most frequently occurring caves. Such caves form in rock that is soluble; most occur in limestone, but they can also form in other rocks including chalk, dolomite, marble, salt, and gypsum. Rock is dissolved by natural acid in groundwater that seeps through bedding planes, faults, joints, and comparable features. Over time cracks enlarge to become caves and cave systems the portions of a solutional cave that are below the water table or the local level of the groundwater Will be flooded..

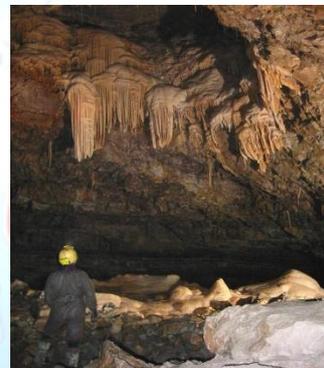


Fig : Solutional cave

1) Primary cave:

Caves formed at the same time as the surrounding rock are called primary caves. Lava tubes are formed through volcanic activity and are the most common primary caves. As lava flows downhill, its surface cools and solidifies. Hot liquid lava continues to flow under that crust, and if most of it flows out, a hollow tube remains. Such caves can be found in the Canary Islands, Jeju-do, the basaltic plains of Eastern Idaho, and in other places. Kazumura Cave near Hilo, Hawaii is a remarkably long and deep lava tube; it is 65.6 km long (40.8 mi).

Lava caves include but are not limited to lava tubes. Other caves formed through volcanic activity include rifts, lava molds, open vertical conduits, inflationary, blisters, among others.



Fig: primary cave

Sea or littoral cave:

Sea caves are found along coasts around the world. A special case is littoral caves, which are formed by wave action in zones of weakness in sea cliffs. Often these weaknesses are faults, but they may also be dykes or bedding-plane contacts.

Some wave-cut caves are now above sea level because of later uplift. Elsewhere, in places such as Thailand's Phang Nga Bay, solutional caves have been flooded by the sea and are now subject to littoral erosion. Sea caves are generally around 5 to 50 metres (16 to 164 ft) in length, but may exceed 300 metres (980 ft).



Fig: Sea or littoral cave

Glacier cave:

Glacier caves are formed by melting ice and flowing water within and under glaciers. The cavities are influenced by the very slow flow of the ice, which tends to collapse the caves again. Glacier caves are sometimes misidentified as "ice caves", though this latter term is properly reserved for bedrock caves that contain year-round ice formations.



Fig: Glacier

2) Fracture cave:

Fracture caves are formed when layers of more soluble minerals, such as gypsum, dissolve out from between layers of less soluble rock. These rocks fracture and collapse in blocks of stone

WORLD FAMOUS CAVE

1. Mulu Caves:

The Mulu Caves are located in the Gunung Mulu National Park in Borneo and are one of the top tourist attractions in Malaysia. The park encompasses incredible caves and karst formations in a mountainous equatorial rainforest setting. The Sarawak chamber found in one of the underground caves measures 700 by 396 meters (2,300 feet by, 1,300 feet) and at least 70 meters (230 feet) high and is the largest cave chamber in the world. It has been said that the chamber is so big that it could accommodate about 40 Boeing 747s, without overlapping their wings. The enormous colony of Wrinkle-lipped bats in the nearby Deer Cave exit almost every evening in search of food in a spectacular exodus.



Fig: 1. Mulu Caves

2. Jeita Grotto:

The Jeita Grotto consists of two separate but interconnected karstic limestone caves: the upper grotto and the lower grotto. The upper grotto houses the world's largest stalactite – a mineral deposit that hangs from the ceiling of a limestone cave. The lower gallery which has an overall length of 6,200 meters (20,300 feet) is located 60 meters (200 feet) below the upper gallery. It is traversed by a smooth underwater river and a lake.



Fig 2. Jeita Grotto

3. Carlsbad Caverns:

Carlsbad Caverns is a National Park located near Carlsbad, New Mexico. Carlsbad Caverns includes the Big Room, a natural limestone cave chamber which measures 1,219 by 190 meters (4,000 by 625 feet), and 107 meters (350 feet) high at the highest point. It is the seventh largest cave chamber in the world. The caverns are decorated with stalactites, stalagmites and an

incredible variety of other formations that can be seen by several easily accessible trails.



Fig 3. Carlsbad Caverns

Advantages of caves:

- The construction of cave homes requires low technology.
- They are protected from the elements, and are insulated from the extremes of heat and cold.
- The natural material lime, salt are available.

CONCLUSIONS

Caves also used as the living purpose low cost construction

REFERENCES

- 1) Whitney, W. D. (1889). "Cave, n.1." def. 1. The Century dictionary: An encyclopedic lexicon of the English language (Vol. 1, p. 871). New York: The Century Co.
- 2) "Cave" Oxford English Dictionary Second Edition on CD-ROM (v. 4.0) © Oxford University Press 2009
- 3) Moratto, Michael J. (2014). California Archaeology. Academic Press. p. 304. ISBN 9781483277356.
- 4) Lowe, J. John; Walker, Michael J. C. (2014). Reconstructing Quaternary Environments. Routledge. pp. 141–42. ISBN 9781317753711.
- 5) "A Study on E-Highway-Future of Road Transportation" International Journal of Engineering and Advanced Technology (IJEAT); ISSN: 2249 – 8958, Volume-8, Issue-2S2, January 2019; SCOPUS INDEXED..
- 6) "Study of Importance of Road Network in Rural Economic Sector" Review of Research; ISSN: 2249-894X; Volume- 08, Issue- 1; October-2018.
- 7) "A study on Water Bulb-used as a day time light" North Asian International Research Journal of Sciences, Engineering & I.T.; ISSN: 2454-7514; Vol.4, Issue 10; October-2018.
- 8) "A Study on Artificial Moon" International Journal of Engineering Development and Research | Volume 6, Issue 4 | ISSN: 2321-9939; 2018.
- 9) "A Study on Flood Defense System" International Journal of Current Research; ISSN: 0975-833X; Vol. 10, Issue10' pp. 74571-74574, October 2018.
- 10) "A study on Hyper loop- the envisaged & advanced means of transportation" International Journal of Research and Analytical Reviews (IJRAR),(E-ISSN

2348-1269, P- ISSN 2349-5138);Volume 5, Issue 4,December 2018.

- 11) "A Review on Programmable Cement" International Journal of Current Advanced Research ISSN: O: 2319-6475, ISSN: P: 2319-6505, Impact Factor: 6.614, Volume 7; Issue 11(C); Page No. 16302-16303; November 2018.
- 12) "A Study on Tsunami Protection Works" International Journal of Engineering Science Invention (IJESI); ISSN (Online): 2319 – 6734, ISSN (Print): 2319 – 6726; || Volume 7 Issue 12 Ver II || Dec 2018 || PP 43-46.