

Fig. 1.71 Some Karst landforms.

KARST LANDFORMS

1. **KARREN/LAPIES** These are grooved, fluted features in an open limestone field. (Fig. 1.71)

2. **CAVERN** This is an underground cave formed by water action by various methods in a limestone or chalk area. There are differing views on the mode of formation of these caverns. The Mechanical Action school represented by Penck, Weller and Dane considers mechanical action by rock debris and pebbles to be responsible for cavern excavation. This school argues that the water table is too low to have a solution effect. The Chemical Action school, on the other hand, considers the solution action of water to be mainly responsible for cavern excavation. This school is represented by Davis and Piper.

The largest cavern in Kentucky (USA) is 48 km long and 25 metres high. In India, such caves can be seen in Bastar, Dehradun, Shillong plateau.

3. **ARCH/NATURAL BRIDGE** When a part of the cavern collapses the portion which keeps standing forms an arch (Fig. 1.71).

4. **SINK HOLE/SWALLOW HOLE** Sink holes are funnel shaped depressions having an average depth of three to nine metres and, in area, may vary from one square metre to more. These holes are developed by enlargement of the cracks found in such rocks, as a result of continuous solvent action of the rainwater. The swallow holes are cylindrical tunnel-like holes

lying underneath the sink hole at some depth. The surface streams which sink disappear underground through swallow holes because these are linked with underground caves through vertical shafts. (Fig. 1.71)

5. **KARST WINDOW** When a number of adjoining sink holes collapse, they form an open, broad area called a karst window.

6. **SINKING CREEKS/BOGAS** In a valley, the water often gets lost through cracks and fissures in the bed. These are called sinking creeks, and if their tops are open, they are called bogas.

7. **DOLINES** These are small depressions dotting a karst landscape. (Fig. 1.72)

8. **UVALA** A number of adjoining dolines may come together to form a large depression called uvala. (Fig. 1.72).

9. **POLJE/BLIND VALLEY** A number of uvalas may coalesce to create a valley called polje which is actually a flat floored depression. If the streams lose themselves in these valleys, then these are called blind valleys. These valleys may have surface streams and may be used for agriculture.

10. **DRY VALLEY/HANGING VALLEY/BOURNE** Sometimes, a stream cuts through an impermeable layer to reach a limestone bed. It erodes so much that it goes very deep. The water table is also lowered. Now the tributaries start serving the subterranean drainage and get dried up. These are dry valleys or bournes. Lack of

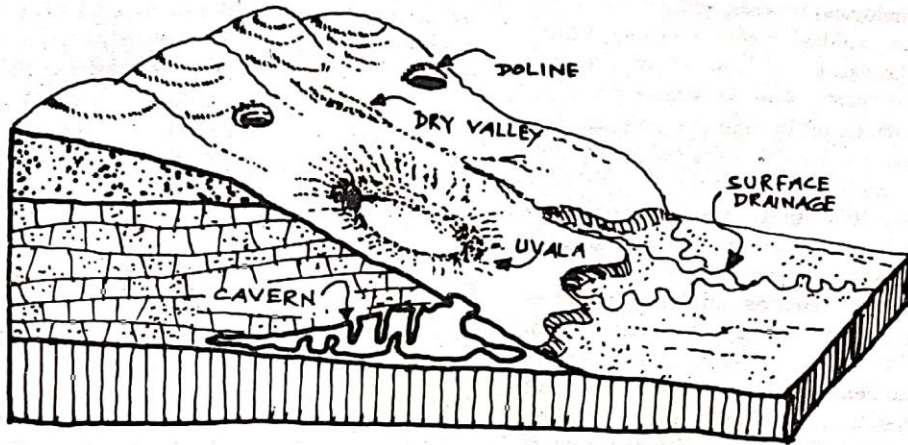


Fig. 1.72 A generalised representation of a karst landscape.

adequate quantities of water and reduced erosion leaves them hanging at a height from the main valley. Thus, they are also referred to as hanging valleys.

11. **HUMS** These are curved relicts of limestone rocks after erosion.

12. **STALACTITE AND STALAGMITE** The water containing limestone in solution, seeps through the roof of caverns in the form of a continuous chain of drops. A portion of the roof hangs on the roof and on evaporation of water, a small deposit of limestone is left behind contributing to the formation of a stalactite, growing downwards from the roof. The remaining portion of the drop falls to the floor of the cavern. This also evaporates, leaving behind a small deposit of limestone aiding the formation of a stalagmite, thicker and flatter, rising upwards from the floor. Sometimes, stalactite and stalagmite join together to form a complete pillar known as the column.

THE KARST CYCLE OF EROSION

YOUTH Youth begins with the surface drainage on either an initial limestone surface

or one that has been laid bare and is marked by progressive expansion of underground drainage. Gradually, the upper impervious layer is eroded. Dolines, sink holes and swallow holes are particularly characteristic of this stage. No large caverns exist and underground drainage has not yet completed its course.

MATURITY Now, there is maximum underground drainage. Surface drainage is limited to short-sinking cracks ending in swallow holes or blind valleys. Cavern networks are characteristic of this stage. This is the time of maximum karst development. Late maturity marks the beginning of the decline of karst features. The portions of cavern streams are exposed through karst windows. These expand to form large uvalas, and detached areas of original limestone upland begin to stand out as hums.

OLD AGE Large scale removal of limestone mass leaves behind a karst plain. There is a reappearance of surface drainage with only a few isolated hums as remnants of the original limestone terrain.