

the limestone rocks of that locality, which he attributes to the chemical effects of rain-water acting upon the surface.

These Carniola cavities must not be confused with the "dolinas" or "swallow-holes," which are of common occurrence in many limestone areas. The latter are explained as insinkings of the surface which have taken place after the subjacent mass of limestone has been undermined by subterranean caverns. Recent geological writings have shown that dolinas pre-eminently occur along natural joints and fault-planes, into which surface-water readily passes.

While dolinas, Carniola cavities, and "Karrenfelder" are forms of erosion limited to limestone mountains or table-lands whose rock is firm and compact, the so-called geological "organs" or earth-pipes (sand-pipes, sink-holes) occur chiefly in plains whose rock-material consists of soft, fissured limestone, calcareous conglomerate or gypsum. They are cylindrical or funnel-shaped cavities, generally upright in position, and filled partially or wholly by loam, mud, or sand.

Sand-pipes were first described by Brongniart and Cuvier (1811) from the neighbourhood of Paris, and were called "Puits Naturels." In 1813, Mathieu described similar pipes, narrowing towards the base, at Petersberg, near Maestricht, and he called them "Orgues géologiques," the name which is still commonly used. Other writers of that time, Gillet-Laumont and Bory, explained them as due to the solvent and mechanical action of water, infiltrating from the surface, but this idea was contested by later writers, and various erroneous explanations were offered. Lyell and Prestwich examined the earth-pipes and sack-shaped depressions in the chalk of the south of England; and they proved beyond doubt that these hollows had been eroded by the chemical action of surface water rich in carbonic acid, which had primarily found its way along any surface crack, or the fine tubular perforations formed by the root-growths of the surface vegetation. The infilling of sand and clay was derived from the surface layers and soil.

In the Bavarian plain, Penck's recent researches on the glacial and interglacial deposits have brought to light many fine examples of sand-pipes occurring in the nagelfluë or rough limestone conglomerate deposits laid down by glacial floods. Penck thought the sand-pipes had been hollowed out during the period when the nagelfluë presented a surface