An Icelandic Cave.

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The study of the Icelandic Cave, which is the topic of this paper, is of interest to the Speleologist from the general aspect of cave formation, of which this is a unique example.

The cave in question is Surtshellir, which runs for some three miles under an ancient lava flow. The manner of its formation is problematical. Professor Paikull, in 1868, suggested various solutions, one being that it is a long lava bubble. This, however, does not seem probable. The entrance is under the flat lava roof, where it has broken away on the hill-side. The cave itself is, in parts, some 40 to 50 feet wide by 30 feet high, with numerous off-shoots in the course of its length. Prior to the glacial epoch it appears that a stream had cut its ravine where the cave now exists. This is indicated by all the familiar evidence of water action on the sides. Subsequently, during the glacial epoch, ice and snow filled up the ravine. Then a lava flow covered the whole district, melting the snow over the surrounding district, but over-riding the ice in the ravine which was not melted. Such occurrences were observed by Sir Charles Lyell on the flanks of Ætna, where a mass of ice is preserved under lava. Following this, during the warmer climate, the melting of the ice and snow in the ravine left the cave as we now know it, but it still contains what from their great size may be called stalagmites and stalactites in ice instead of in calcium carbonate. Their surface is not smooth, but formed of hopper crystals which, it is said, only occur by direct condensation of atmospheric moisture, which passes directly from the vaporous to the solid condition.

The probable reason for the ice remaining as ice under a hot lava flow is that a layer of volcanic dust, the ulterstices between the particles being occupied by steam, was formed on the upper surface of the ice. This layer being relatively a non-conductor of heat would prevent the melting of the lower layers. Further evidence in favour of the interpretation here offered is afforded by a thin film of lava which coats in many places the sides of the water-cut ravine. The more liquid tachylite seems to have drained out from the lava stream above, and sometimes formed lava "icicles" three or four inches in length.

In the neighbourhood of Thingvellir the results of the overriding of ice by lava is exhibited on a far grander scale. Here a broad glacier was thus buried during the glacial epoch. The ice has long since melted, and the lava-flow has sagged down. Huge cracks were formed at the edges, and formed the picturesque ravines in the neighbourhood of Thingvellir—photographs of which were shown.

The contents of the cave are few. At one spot, known as the Robbers' Cavern, a portion of the cave was evidently used at one time as a dwelling, for there are the remains of charred wood with a few sheep and pony bones, giving indication of comparatively recent occupation. Tradition says that in about the 15th century schoolboy outlaws occupied the cave in attempting to hide from the consequences of the murder of an old woman.