SURTSEY, ICELAND

Iceland sits astride the Mid-Atlantic Ridge and is entirely volcanic in origin. Mount Hekla has erupted 20 times since 900 AD but eruptions along long fissures may occur only once.

Stage 1 - Quiet eruptions begin some 130m below the ocean's surface and continue for several weeks, building up a volcano just below the sea's surface. Clues to the coming explosive eruption are (i) a definite rise in ocean surface temperature noticed 2 days before (ii) the rotten egg smell of hydrogen sulfide 2 days before (iii) a seismograph recording of weak tremors the week before.

Stage 2 - In the ocean off Ireland, early November 14, 1963 begins with an explosive eruption of ash and steam rising 3500m (Mount Whitney is 4418m high). Eruption and growth of this volcanic island occurs almost continuously. The pyroclastic debris is weathered easily by the ocean waves, but in four days the island is 550m long and rises 45m high. It is split lengthwise by the erupting fissure. One vent becomes dominant and the island's growth becomes more circular. By November 24, the island is 900 x 650m and 100m high. By February 5, 1964, it is 1300m in diameter with a maximum height of 174m. A wave-cut terrace around the shore is 150m in width.

Stage 3 - With the central fissure protected from the ocean, lava flows begin with an emission temperature of 1140 ^{o}C. By April there is a capping of hard, lava rock over the looser volcanic debris which will protect the island's 2.5 km^2 area from the ocean. During 1965 and 1966 other low islands will emerge but, built of loose debris, they will soon be washed away. The island building stops in June 1967.