

SURTSEY

Evolution of life on a Volcanic Island



STURLA FRIDRIKSSON

Butterworths

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*Frontispiece: An aerial view of Surtsey,
summer 1973*

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EVOLUTION OF LIFE ON A
VOLCANIC ISLAND

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PREFACE

This book about Surtsey describes the exceptional event that took place when the sea started to boil off the Icelandic coast. It gives an account of the volcanic eruption that began on the ocean floor in 1963, and of the formation of the island that at the time attracted worldwide attention. The eruption was truly a magnificent phenomenon, with which little else can be compared. It lasted for over three and a half years, and it was naturally a wonderful sight for the many tourists who stop over at Keflavik International Airport in Iceland on trans-Atlantic flights.

Of course, I followed the progress of the eruption and the building up of the island with great interest, but I also waited eagerly for the time when the fires would subside and the surface of the island begin to cool down. It could be foreseen that a unique opportunity for biological research would here present itself, which would be no less interesting than the history of the formation of the island itself, though the former might be slower and less spectacular when compared with the grandeur of the geological story.

Admittedly, it is possible to study some aspects of colonisation by putting out buoys or rafts and then waiting until some form of life establishes itself there. It also happens that when sandspits form in estuaries, the invasion of life may be observed. But here something quite different and much greater had happened: a whole island had been created, and an extensive area of land had been formed from the primary rock. From the depths of the ocean there had been built up a broad base, on the top of which was an island with mountains and craters, lava flows, cliffs, gentle slopes, flat sandy beaches and withered coastal strips with worn, rounded pebbles and boulder rims that gave the landscape an ancient appearance. Surtsey had thus a diversity of topographical features and a variety of substrates in marine and terrestrial habitats.

Although Surtsey was way out in the ocean, it was not long before various living organisms began to appear on the island. Some of these happened to fall into a favourable substrate and consequently succeeded in establishing themselves. All such events were recorded as they occurred, and one could be sure that a trip to the island would always reveal something new of interest to a biologist.

When walking along the coast of the virgin island, it was an amazing sight to see the first leaves of a sprouting seedling like a small green star on the black basaltic sand—the first

higher plant to commence growth on this great island. Similarly, it was a great event during an expedition in 1967 when a group of scientists discovered the first flowering plant. The following observation was expressed by one of the participants, Dr. John Marr of Colorado University:

Walking on newborn land of dust and rocks fresh from the earth's interior is not just another conference field trip. Geologists risking burned noses while bending over the edge of a small crater to get a glimpse of our planet's ultra-boiling inside, and botanists huddled down on wet volcanic beach sand in cold rain to see the first plant to flower on the earth's newest mountain are living the thrills that drive field scientists abroad in search of new facts, new ideas and unique experiences.

People have trudged up the track trodden out in the loose cinders, ascending the hill above the research hut, in order to obtain a good overall view of the spouting craters and the rough expanse of lava. Traversing this lava was slow, difficult and dangerous. There were cracking noises when the newly congealed surface of the lava crust gave way below one's feet, and red-hot magma could be seen glowing in the crevices. It was not advisable to remain long in the same spot, for the soles of one's boots soon started to smoulder, and if a rucksack was carelessly left behind it might start to melt in the uprush of hot air. Bluish vapour arose from the craters, while glowing lava and Pele's hairs were whirled up from the magma mass when the wind swept across the crater openings. But these same air currents, which blew light pumice around and scoured the mountain cones, also carried spores and feathered seed from the mainland that became stuck in the rough surface of the lava. And one day there suddenly appeared a thin green cover on the black lava—the first moss plants had conquered the newly moulded glassy surface of the rock.

At the same time as the magma poured into the ocean, building up the lava layers one on top of the other, the waves were slicing from the latter enormous blocks that were back-folded upon the edge of the cliff and with fantastic power moving them hundreds of metres along the shore, polishing them into rounded boulders and stacking them up on the leeward side. Sheltered by these, seaweed and seed of coastal plants were washed ashore: the first invaders of life on this newly formed volcanic terrace. The powerful pounding of the ocean waves continually broke the rock and carved high cliffs into the lava edge, and during one spring a few sea-birds found the ledges of these cliffs an ideal place for laying eggs and rearing their young. In this way the forces of destruction and construction balance one another, while the cold, barren surface of the island is gradually transformed into teeming life with green areas of vegetation, swarms of flies and flocks of birds.

Although studies of the life on the island are being steadily continued, they are subject to the whims of the weather. Landing on the island has often been difficult and, although

the rubber dinghies powered by outboard motors are excellent vehicles, they have frequently come to grief in the surf barrier. Cameras and various items of research equipment have fallen into the sea, and many a scientist has had a chilly ducking. The sandy terrace has also proved a poor landing-strip for the single-engined plane used for transportation purposes. During spells of bad weather there has been no connection at all with the mainland. Yet despite these and other difficulties, scientists have met the challenge and stayed for short or long periods in order to satisfy their curiosity and to trace the history of the development of life on this remote island.

Sturla Trifliksson

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