of regeneration indicates that there has only been a temporary setback.

VEGETATION PATTERNS ASSOCIATED WITH ASH SHOWERS

The paradox of the vegetation patterns of the Kaimanawa Ranges is that forests are most completely developed nearest the centre of the latest major eruption, while towards the south and south-east forest becomes discontinuous and of simpler structure, which suggests some degree of an outward colonisation towards the margin of the shower, but also from a wetter to a drier area.

This contrasts with the succession patterns on the western side of the shower beyond Lake Taupo in the Hauhangaroa Range. Here they show an inward recolonization from the unaffected forests of the King Country across the surface of the ash towards the centre of the eruption, and aided by the prevailing north-westerly wind.

From Fletcher's information it appears likely that podocarp forest was continuous round the whole perimeter of the lake 300–400 years ago, which would account for the podocarp remnants on the fringes of the Northern Kaimanawa forest. The problem is to account for the presence of well-developed beech forest well within the radius of buried charred timber and apparent total destruction with no adjacent seed source.

Extensive silver beech forest occupies the Northern Kaimanawa Range near the centre of eruption, with scattered colonies of clearly waterborne seed down the Ngarurоro and Mohaka Valleys. There are stands of silver beech in part of the Ahimanawa Range, but these appear to be invasions from the Mohaka colonies. The nearest extensive area lies 30 miles to the north-east across the inhospitable Kaingaroa Plain, and there is also silver beech on the western slopes of Ruapehu. Small pockets west of Lake Taupo, on Pihanga, in the Waipakihi and in the Moawhango suggest relics of more extensive silver-beech forest which have been isolated by the eruption and are barely maintaining themselves.

Red beech is also established near the centre of eruption, and mountain beech only a few miles further south. They present the same problems as silver beech, though in a less striking form. It is difficult to imagine that forest, particularly silver-beech forest, could have survived so close to the centre and equally difficult to visualize an outside seed source. Unless all three species survived within the area of charred forest remnants recolonization would have had to advance from the margin across the Kaingaroa Plains, the Inland Patea plateau or the Rangipo Desert. The most likely hypothesis seems to be that sufficient seed was deeply enough buried to escape immediate destruction by heat and then exposed by the deep gullying which is frequently characteristic of unconsolidated ash.

The transport of beech seed is the main problem. The speed with which associated species with wind- or bird-carried seed have established themselves over wide areas in the exotic plantations in the Atiamuri district is impressive evidence that the supply of such seed is ample to a considerable distance from possible sources.

There is evidence that the destruction of vegetation by volcanic eruptions is less complete and its recovery quicker than one would infer from the evidence of catastrophic forces at work. The Tarawera eruption (1886) was not comparable in scale nor in nature with the Taupo eruption, and is only referred to here as it gives some picture of the process of recovery under New Zealand conditions. A recent summary of its effects by Nicholls shows that the first accounts of the major destruction of vegetation by the deposit of mud and scoria were exaggerated. Not only was the reappearance of fern and other low-growing vegetation rapid, but recent Forest Survey plots in forest as close as three miles to the vent found no visible effects on the pre-eruption canopy trees.