

## INTRODUCTION

THE author's close association with the forests of the Huiarau Range and its environs, as a member of the Forest Research Institute, New Zealand Forest Service, terminated at the end of 1951.

Since then, more detailed information relating to species distribution may have been collected; but it is prudently considered that additional data of this kind would not materially alter the major deductions and hypotheses presented.

Detailed forest descriptions are not generally attempted, except where thought desirable in relation to an important deduction or hypothesis.

While varying amounts of evidence are presented for the hypotheses proposed it is extremely important that others set out to test the strength of each hypothesis and leading deduction. It is true that some deductions and ideas are extrapolated beyond the safe limits of the available data; but this is intentional. By such provocative means it is hoped, firstly, to bring to wider notice ideas upon which others may already hold useful information. In the second place it is intended to stimulate greater activity and thought, particularly among foresters, for many have the means at their disposal for the confirmation or modification of the main ideas put forward.

The writer's only apology lies in the thought that if foresters, and others, are able to derive any practical benefit from these contents, then it is unfortunate that circumstances did not permit their presentation at an earlier date.

## SECTION 1—ENVIRONMENT

The Huiarau Range is a complicated mountain mass of the North Island. It lies to the east of Lake Taupo and extends north-eastwards from the Taupo-Napier State Highway (No. 5) for about 45 miles (Fig. 1). The eastern portion is traversed by the Rotorua-Lake House State Highway (No. 38) which crosses the divide at the Taupuke Saddle, 3,015ft above sea level. A low saddle, about 1,950ft between the heads of the Whakatane and Waiau rivers, separates the regions referred to as the East and West Huiaraus (Fig. 3). Several peaks ascend to over 4,000ft in elevation, the greatest recorded height being 4,602ft on Mt Manuoha in the East Huiarau. With the exception of a few agricultural clearings and the tops of some mountains, the range is forested.

Its geology is made complex by the occurrence of Triassic-Jurassic greywacke and argillite, Cretaceous sandstones and mudstones, and at least two groups of Tertiary sandstones and mudstones. The West Huiaraus consist largely of greywacke and argillite, while the eastern region is largely composed of sandstones and mudstones. These younger rocks are block-faulted, and steeply tilted and over a wide area dip to the south-east, forming a more or less parallel series of ridges which trend north-east and have very steep escarpments. A conspicuous fault-line, more or less paralleled by the Whirinaki River, marks the western extent of the Range.

As would be expected the soils are extremely variable. On more stable slopes they are derived wholly or in part from pumiceous deposits; the uppermost being chiefly from the Taupo Shower dated around 200 A.D. (Fergusson and Rafter, 1959). Elsewhere on slopes skeletal soils predominate. Volcanic ash particles become finer and the deposits more shallow towards the east.

Prevailing winds are from westerly quarters with the accent on north-west. These supply moisture, but chiefly to the north and west faces of the range. Much of the region is affected by cool winds from southerly and easterly quarters. These cool winds attain high velocities and distribute moisture over the greater portion of the mountain system but chiefly over areas to the south and east of the divide. These latter localities are generally moister than those on opposing faces,