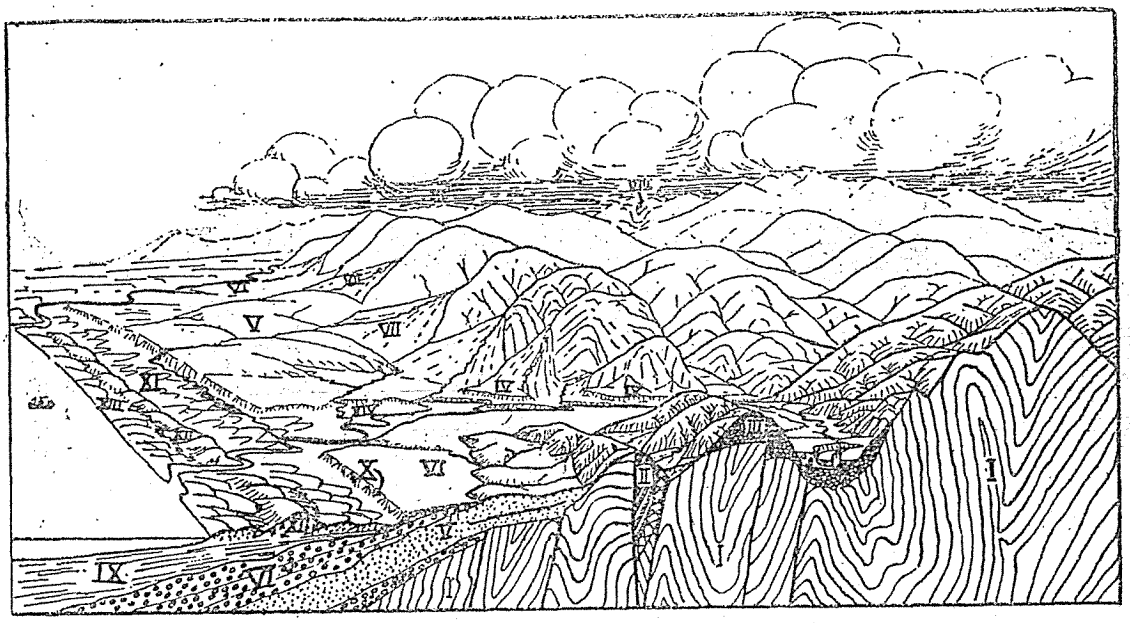
H. Grant



The accompanying drawing is diagrammatic and hypothetical, as its aim is to show all the main formations of Horowhenua in one view. They can be identified by numbers that correspond with those in parentheses in the accompanying description.

The Genesis Of Horowhenua

Horowhenua has progressed and changed so rapidly during a century and a quarter of settlement that it is hard to realise how many millions of years it took to form its rocks and soils and shape the beauties of its landscape. Let me try to highlight some of the landmarks in this pre-history.

No record remains in the North Island of the first two thousand million years of earth history. Our oldest rocks, the Tararua greywackes (I) were laid down below the sea in a furrow in the earth's crust that extends far to the north and south of New Zealand. It was filled with thick sands and muds of Triassic Age (180 million years old), later complexly folded and hardened in the Cretaceous, 100 million years ago, to form our local stone for aggregate and road-metal. After the Cretaceous upheavals, long erosion wore down the ancient mountains to a plain, long ago destroyed or disrupted.

Advancing seas flooded the land once more about 400 million years ago, depositing quartzite and greensand (Oligocene, II) that remain tucked into the greywacke hills behind Waikanae, but have been completely removed by erosion elsewhere in the Horowhenua district. For another 30 million years no deposits were left to guide the geologists' speculations, and Horowhenua was probably a slowly rising land flanked by shallow Miocene and Pliocene seas which lay far to the west (in Taranaki-Nelson) and to the east (in the Wairarapa). Gradually the tempo of earth movements increased, the land became narrower and higher as Pliocene seas, 10 million years ago, flooded across from both sides to link across the divide as a "Manawatu Strait" between Palmerston and Woodville.

A MILLION YEARS AGO

At the dawn of the Ice Age, about a million years before Man came to Horowhenua, the sea still filled deep bays from Wanganui to Palmerston, and extended across to Woodville but the mountains were struggling to rise and soon drove the sea out of "Manawatu Strait." The Tararuas were high enough to feel the frosts of the early ice ages, and the ancient rivers built up their beds with heavy gravels that still remain near Reikorangi and perhaps elsewhere.

These ancient Reikorangi Gravels (III) contain fossil evidence of cold-climate tussock grasslands, which clothed the mountains, while at lower levels there grew a forest vegetation that has passed away—extinct beech trees like those now living in New Caledonia and New Guinea. These plant fossils show that the Reikorangi Gravels are about the same age as the similar Moutere Gravels of Nelson.

Continued mountain growth, movements of faults and upheavals of anticlines, have since upheaved the gravels so that they drape hill-tops more than 1,000 feet high.

After the early ice ages, in an interglacial period of warm climate, much of the land surface was deeply weathered and stained a bright rosy red, perhaps in a monsoonal climate. Bulldozer excavations on the hills now bring to light pink patches of this ancient soil that have persisted through half a million years of change in favoured places.

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This article was specially written for the Weekly News Christmas Supplement by Dr. C. A. Fleming, chief paleontologist of the Dept. of Scientific and Industrial Research, Lower Hutt.

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Before the later ice ages, the land had gained its present outline, though some fault-lines remained active into recent times and their movements have made grooves and steps that cross the landscape like cracks on a subsided pavement. Each glacial period produced a gravel terrace sloping down to a sea level far below the present shores. The higher terraces (IV) at Reikorangi and near Hautere Cross Road, Otaki, were river beds formed in the Glaciation before last, when snow capped the range and cold climate drove bush out of Wellington. At such times the hills were clad in tussock and alpine scrub and frosts spalled off rock debris from the slopes, to form gently sloping fans that flank the hills.

Between the last two glacial ages, the climate warmed up, the forest came back, ice melted throughout the world and the sea rose to lap the mountain borders. Instead of gravels, sands drifted down the coast from the north and accumulated on beaches and in dunes to form the rusty brown Otaki Sandstone (V) that forms much of the easy plateau country from Shannon to Levin south to Otaihanga. Peats in these interglacial sands preserve remains of a distinctive forest of New Zealand Cedar and Tanekaka.

The last glaciation, which ended less than 20,000 years ago, left the clearest traces of all. Thick gravel terraces (VI) border all the main rivers and are clearly marked near Otaki by piles of surface stones cleared from the land by relief workers during the Depression.

Near Waikanae, houses are now spreading onto the loess-covered fans (VII) built out from the hills during the last cold period. Ice and glaciers were confined to the highest Tararua peaks and the only true glacier valleys (VIII) so far reported are near the Girdlestone—Dundas ridge S.E. of Levin. The best evidence for a glacier, in Park Valley, was described 50 years ago by G. L. Adkin, Levin's own geologist. But even on the Golden Coast, conditions were bleak indeed, and cold winds blew fine dust from the river beds to coat the slopes with loess that now forms heavy but fertile soils.

BURIED DEPOSITS

About 18,000 years ago the lowered sea lay far to the south and gravelly plains bridged western Cook Strait. Then the sea began to rise as the earth warmed up. Nine thousand years ago its level was still 150 feet below Foxton. As the warming sea advanced it laid down beach sands, shells and peat along the coast, and many coastal residents (and some local bodies) now draw water from wells in these young buried deposits (IX).

The rising sea reached its highest point some 5000 years ago and carved a cliff (X) that marks the post-glacial shore from Paekakariki to the Otaki River (near Te Waka Road) and probably beyond to the Manawatu. West of this old cliff, all the land is new—sand dunes and swamps (XI) progressively younger towards the coast, formed as the sand from the north drifted southwards on the beaches. The peats preserve the evidence of changing vegetation during the past 4000 years, and even the dunesands are not as monotonous as they seem.

About 1800 years ago, perhaps when Marcus Aurelius ruled the Roman Empire, a tremendous eruption of pumice blew out of Lake Taupo, and rafted down the Wanganui to the sea.

It piled up on the Golden Coast, and nourished a belt of steep sand dunes (XII) that can be traced up the coast, labelled by their distinctive content of fine pumice pellets. The Taupo Pumice Beach of about 200 A.D. lies seaward of this pumiceous dune, in most places buried by later sands (XIII) or peaty swamp.

The Moa roamed the coastal sands, leaving its bones in the treacherous swamps and its gizzard stones in many dunes. While the coast was building out, the rivers formed their lower flats, with young alluvial soils much sought after by gardeners (XIV).

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