

ROCKS AND TREES OF THE C. I. KIDSON MEMORIAL

1964



PART I—ROCKS

The description starts from the eastern end in the order, Rocks, Minerals and Miscellaneous.

GRANITE (2 samples): Granite is a coarse crystalline acid igneous rock of variable colour and texture. Extensive granite masses occur from Separation Point to the headwaters of the Motueka River and throughout the western Nelson district.

BROOK STREET VOLCANICS: Basic igneous rocks usually greenish, relics of volcanic activity about 250,000,000 years ago. Weathers to brown on the surface. Well-defined areas extend from the Brook Reservoir down the valley and through to Cable Bay.

CONGLOMERATE (3 samples): Cemented sediments composed of rounded pebbles in a sandy matrix. Colour and composition vary widely, depending on the source of fragments and the period at which they were deposited. Various types are found in many areas around Nelson.

BRECCIA (2 samples): As for conglomerate, except that breccia consists of angular fragments instead of rounded pebbles. Both conglomerate and breccia may be found in deposits of most geological periods.

GREYWACKE: Older sandstones are changed and hardened by pressure to give greywacke. The bulk of the mountainous country of the South Island contains much rock of this type.

ADZITE (3 samples): This rock is of great local interest. It occurs near the margins of the mineral belt from D'Urville Island to Tophouse. Various names, usually long and unsatisfactory, have been used in describing it. It is frequently referred to as argillite. As it was greatly prized by the early Maori inhabitants who used it in considerable quantities for making adzes and other tools, the name adzite is appropriate. Large quarries were worked by the Maori people and the material was traded throughout New Zealand. It could be claimed as this district's earliest export commodity.

The rock is a much altered and very hard, fine textured argillite. Broken fragments can have razor-sharp edges. Many large boulders are found in the Roding, Maitai and Whangamoa Rivers. Large granite boulders were carried from such areas as the Boulder Bank by the Maoris up to the Rush Pools at the head of the Maitai River to use as anvils and hammers for working this rock.

The sample on the left is water-worn, having the sharp edges rounded off. The top sample on the right is a finished Maori adze, and the sample underneath has been partly worked.

MAITAI SLATES (3 samples): This was an earlier name for these rocks, although they are not actually a typical slate. They consist of hardened sandstones, siltstones and mudstones, in bands of varying textures, and are often handsomely marked by alternating tints of red, green and grey. They were deposited during the Permian period. They have considerable local use in paving and wall structures. The rocks in this area are of this type.

SCHIST: This specimen is a red variety from the Whakamarina Valley, Marlborough. Schist is a foliated rock formed by the action of heat and pressure. It can vary widely in colour and composition. Mica, garnet and other minerals may predominate and lead to particular names being given.

GARNET SCHIST: The garnet crystals are well developed in this specimen from the Takaka Hill. Garnet fragments are much used as abrasives and clear garnets are one of the lower value gem stones.

LIMESTONES (3 samples): Limestones are sedimentary rocks originating in many ways and consisting principally of calcium carbonate. They can show many variations in colour, texture and form. Fossil shells and animal remains are often found in limestone.

Limestone has many important uses. It can be crushed or burnt for agriculture, used in building construction, for decorative work or in the manufacture of cement and in metallurgical and chemical industries. Great quantities in many varieties are found throughout the northern part of the South Island. The specimens shown are found in the Takaka, Roding and Maitai localities respectively.

MARBLE (3 samples): A crystalline metamorphosed (altered) limestone. A wide range of colour and variety is found in Western Nelson. Some of these deposits are of very high purity and contain hundreds of millions of tons. Marble has similar agricultural and industrial uses to those given for limestone. The three specimens shown are from various parts of the Takaka district.

DOLOMITE: A calcium carbonate rock in which magnesium has been substituted for between 10% and 50% of the original calcium. The material has wide uses in agriculture, in glass manufacture and other industrial processes. Mt. Burnett, Collingwood, is the only large source of this material known in New Zealand.

NOTE: Granites, Brook Street volcanics, conglomerates, breccias, greywacke, Maitai slate, limestone and marbles have a great economic value. They are used widely in road construction as sands and gravels, and in concrete aggregates. Very large quantities are used annually.

WOLLASTONITE: A calcium silicate. Deposits are found associated with marble on the Takaka Hill. It has a number of industrial uses.

DUNITE: Consists principally of the greenish mineral, olivine (magnesium silicate), together with small quantities of chromite (black). Its unusual character was first noticed by Dr Von Hochstetter about 1860 and he named this rock from the Dun Mountain, where it is present in large quantity. Large masses also occur in the Red Hills area, Tophouse. The Dun Mountain was so named because of the colour of the weathered rock and Dunite was named from the mountain. It has a potential use in the manufacture of magnesium-phosphate fertilisers.

The sample shows both the dun colour of the weathered surfaces and the greenish colour of the new-broken rock.

SERPENTINE: A hydrated magnesium silicate, notable for its smooth fibrous, resinous characteristics. The colour is usually of shades of green and blue, passing to black. Serpentine is the most prevalent rock of the mineral belt which runs generally north-east, south-west some four miles south-east of this point. It is also abundant in the Upper Takaka area. Serpentine has been employed in ornamental stonework and at present large quantities are being quarried for use in agriculture, principally in fertiliser manufacture.

TALC MAGNESITE: Another mineral allied to serpentine and asbestos. Large masses occur in the Cobb Valley area and considerable quantities are quarried for use in agriculture and as industrial fillers.

ASBESTOS: This mineral occurs with and is allied to serpentine. Considerable quantities of asbestos have been quarried from Upper Takaka. It is notable for its fine, flexible, fibrous structure. It may be woven or moulded into heat-resistant fabrics, sheets, boards, tiles, etc.

RODINGITE (3 samples): An unusual rock which is very plentiful throughout the mineral belt. The external appearance varies greatly, due to the differing sizes and colours of the constituent mineral particles. The principal minerals are grossularite (white or green) and diallage (blackish) pieces of rodingite are often very beautiful. It appears to offer good possibilities for ornamental stonework of various kinds. The middle sample is a rodingite dyke formed by molten rodingite having been forced up into the parent rock.

COPPER ORE: This specimen of copper ore is from the old Champion Mine in the Roding River. The colourful blue and green tints are typical of copper carbonates. Much work and capital was expended on the discovery and extraction of copper ores from the mineral belt between 1855 and 1910. The Dun Mountain tramway and the Roding River smelter were major works constructed for this purpose. Copper lodes were worked from D'Urville Island to the headwaters of the Wairoa River. Although much high-grade ore was recovered, the yields failed to fulfil expectations.

CHROMITE (2 samples): Appreciable quantities of chromium iron oxide of high grade are found in many parts of the mineral belt. Considerable quantities were mined and exported between 1855 and 1865, at which time declining prices caused the extraction to become unprofitable. It is identifiable by its high density.

QUARTZ: Quartz is silica or silicon oxide, a mineral usually white or colourless, but impurities may change it to any colour. In its varying states, it is a most plentiful constituent of the earth's crust. In some crystalline forms it becomes valuable as a gem stone—for example, opal, amethyst and cairngorm.

BARITE: Barium sulphate occurs in the Baton-Wangapeka area. The material has uses in well drilling and a number of other applications.

IRON ORE: Iron oxide from Onekaka was smelted there 20 to 30 years ago. Large quantities of ore remain, but these are not of sufficient magnitude to warrant a large up-to-date processing installation.

TOURMALINE: A complex silicate mineral containing boron. Crystals often occur in attractive groups of radiating needles or columns, as in this specimen from the Takaka district. High quality crystals of various colours are used as gemstones.

FOSSILS (4 samples): Fossils are the relics of animals and plants preserved in sedimentary rocks. Shells, bones, wood and leaves are remains most often found. They vary from complete whales and dinosaurs down to microscopic pollen grains and diatoms. Fossil remains are known from sediment deposited over 500,000,000 years ago. Trilobites of this period are found in the Cobb Valley. A wide range of fossil material can be found in the Nelson area. Fossils aid in establishing the age of rocks.

The first three specimens are Triassic period fossils from the vicinity of Brightwater. These are about 200,000,000 years old, and the mussel-like type is known as *Mytilus problematicus* and the other as *Monotis richmondiana*. The specimen on the right is a fan shell (of middle Tertiary period) about 30,000,000 years old, from the Takaka Valley.

PETRIFIED WOOD: This is found in many localities including the head of Tasman Bay and near Glenhope. It is simply wood preserved and hardened by silification and ageing.

Footnote

DUN MOUNTAIN RAILWAY

The Dun Mountain Railway, which was opened on February 3, 1862, has the distinction of being the first railway in New Zealand. Its route was from the Port via Haven Road, Rutherford Street, Hardy Street, Alton Street, Manuka Street, Brook Street and thence it wound up and around the hills at grades of between 1 in 20 and 1 in 70 until its termination on the mineral belt in the vicinity of the Dun Mountain some 2800ft above sea level. It was built to carry copper and chromite from this area for export. This chrome ore was used for producing dyes used in the cotton industry in England. With the American Civil War, the export trade stopped overnight and production at the mines ceased after less than one year's operation. The railway was used to transport firewood, timber, slates and limestone to the City until the hill section was pulled up in 1872. The line from the Port to the City was used for passenger transport until 1901.

The railway was 14 miles long and 3ft gauge. It cost £2000 per mile to build. The empty trucks were pulled up to the mine by horses and controlled on their downhill run by brakes alone. The old track is still the main walking route to the Dun Mountain, and it passes across the hillside immediately to the east of this point and some 1000ft up. A new track, generally at a grade of 1 in 5, has been built from here to meet the old tramline where it enters the bush.



PART II — TREES

Hebe.
Patete: *Shefflera digitata*.
Kamahi: *Weinmannia racemosa*.
Fierce Lancewood: *Pseudopanax ferox*.
Kaikawaka: N.Z. Cedar: *Librocedrus plumosa*.
Nikau: N.Z. Palm: *Raphostylis sapida*.
Horoeaka: Lancewood: *Pseudopanax crassifolium*.
Rata: Southern Rata: *Metrosideros umbellata*.
Tanekaha: Celery Pine: *Phyllocladus trichomanoides*.
Tawhai-raunui: Red Beech: *Nothofagus fusca*.
Tawhai: Silver Beech: *Nothofagus menziesii*.
Pahautea: Bog pine or Mountain cedar: *Libocedrus bidwillii*.
N.Z. Broom: *Carmichaelia cunninghamii*.
Silver Pine: *Dacrydium colensoi*.
Rimū: Red pine: *Dacrydium cupressinum*.
Kahikatea: White pine: *Podocarpus dacrydioides*.
Matāi: Black pine: *Podocarpus spicatus*.
Pokaka: *Elaeocarpus hookerianus*.
Miro: *Podocarpus ferrugineus*.
Totara: *Podocarpus hallii*.
Coprosma.
Horopito: Pepper: *Pseudowintera colorata*.
Five Finger: *Neopanax aboreum*.
Rangiora: *Brachyglottis repanda*.
Kohuhu: *Pittosporum tenuifolium* (Black).
Karamu: *Coprosma lucida*.
Matipo: *Myrsine australis* (Red).

The following trees will be planted over the next few years:—

Makomako: Wineberry: *Aristotelia serrata*.
Putaputaweta: *Carpodetus serratus*.
Akeake: *Dodonea viscosa*.
Kowhai: *Edwardsia microphylla*.
Konini (Kotukutuku): Tree-fuchsia: *Fuchsia excorticata*.
Papauma: Broadleaf: *Griselinia littoralis*.
Houhere: Lacebark: *Hoheria populnea*.
Rewarewa: Honeysuckle: *Knightia excelsia*.
Mahoe: Whitey-wood: *Melicytus ramislorus*.
Pohutukawa: Christmas tree: *Metrosideros tomentosa*.
Ngaio: *Myoporum laetum*.
Manuka: Red tea tree: *Leptospermum scoparium*.
Tarata: Lemonwood: *Pittosporum eugenioides*.
Tawa: *Beilschmiedia tawa*.
Titoki: *Olectryon excelsum*.
Maire: Sandalwood: *Mida myrtifolia*.
Cabbage Tree: *Cordyline australis*.
Mountain Beech: *Nothofagus cliffortioides*.
Black Beech: *Nothofagus solandri*.
Hard Beech: *Nothofagus truncata*.