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MOUNT PEEL STATION

1856 - 1982

A HISTORICAL STUDY OF THE DEVELOPMENT OF A
HIGH-COUNTRY RUN IN CANTERBURY, NEW ZEALAND.

Gillian Wilson

B. Hort.

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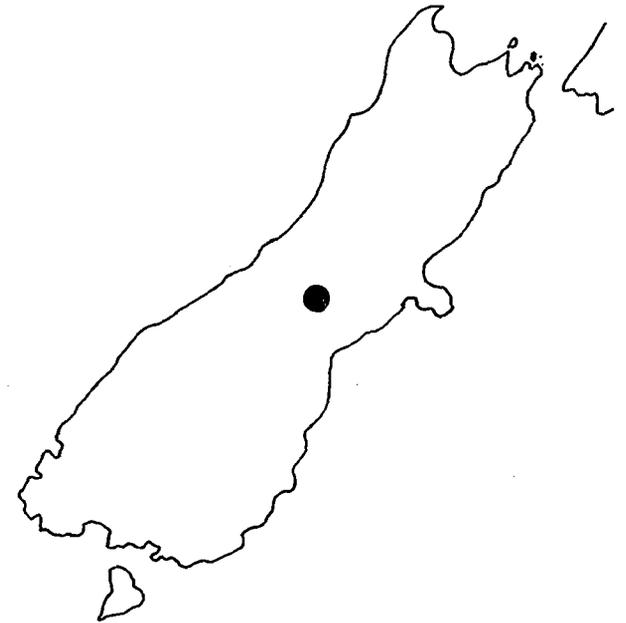
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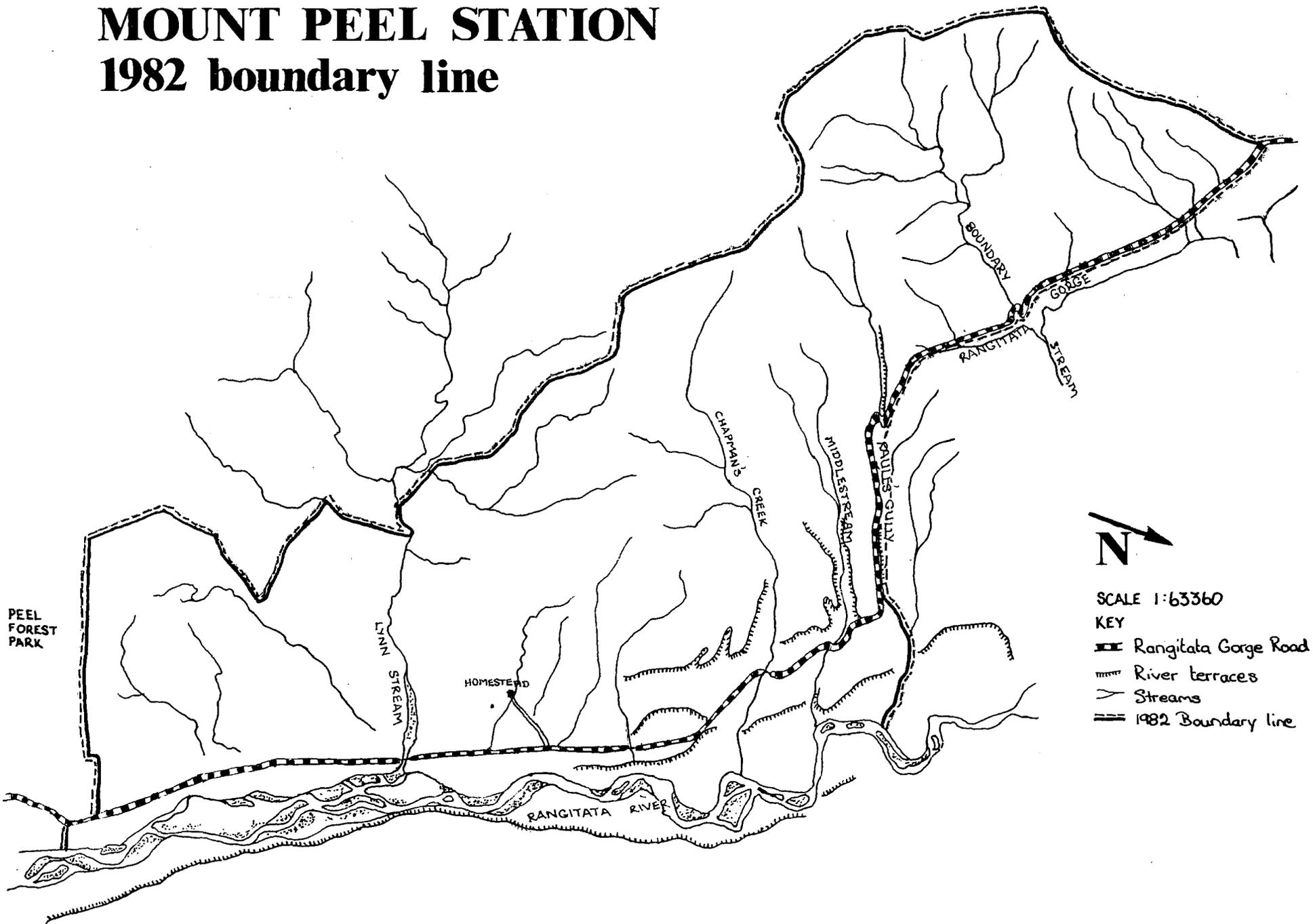
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PART I(a)

Introduction and Location

1 MOUNT PEEL STATION 1982 boundary line



Mount Peel Station is located in South Canterbury, in the Rangitata River valley, about 6.5km from Peel Forest Park and about 60km from Timaru, the nearest city. It occupies the sunny, north easterly slopes of the range of hills about Mount Peel, from the Rangitata River up to a level of about 1600m.

Mount Peel Station is one of the few large stations in New Zealand to have remained under the ownership of the same family. It was established in 1856 by J.B.A. Acland and C.G. Tripp, and since this date it has been controlled by four generations of the Acland family.

The size of the station has changed dramatically during this time; at one time covering about 100,000 hectares, under joint ownership with Acland and Tripp. The station today is only a fraction this size, occupying about 8,000 hectares and to be further divided in the future, with nearly half of this going to the Waikari Hills run. It will, however, still be in the family as the Waikari Hills run is managed by Mark Acland, the brother of John Acland who manages Mount Peel Station at present.

(Refer to MAP 2)

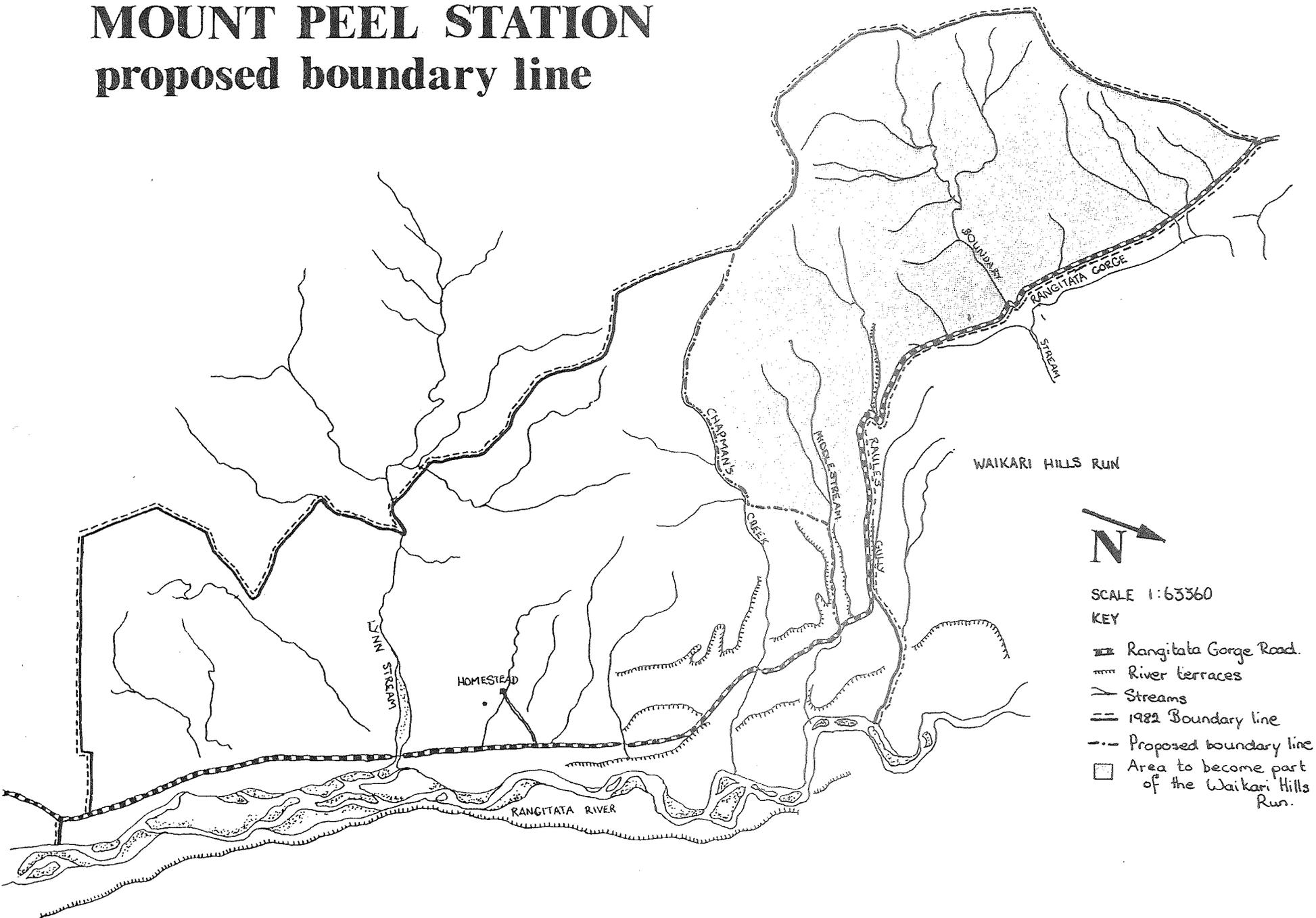
This dissertation looks at the history of Mount Peel Station and especially at the historical development of the agricultural landscape. Part I looks at the natural history of the Mount Peel region, while, Part II concentrates on the factors which have been instrumental in the development of the visible landscape in the area. Part III then goes on to discuss the development

of the homestead area specifically, including the Church of the Holy Innocents, the homestead itself and its gardens.

In Part IV there is a small section of photographs from some of the Acland family albums. Where possible, some of the landscape photographs have been taken from similar angles to illustrate the change which has taken place over the last 100 years or so.

Throughout the history of Mount Peel Station different practices have helped to create the agricultural landscape present today, and which, as part of the whole rural landscape, is so important to the increasing urban populations as a visual resource.

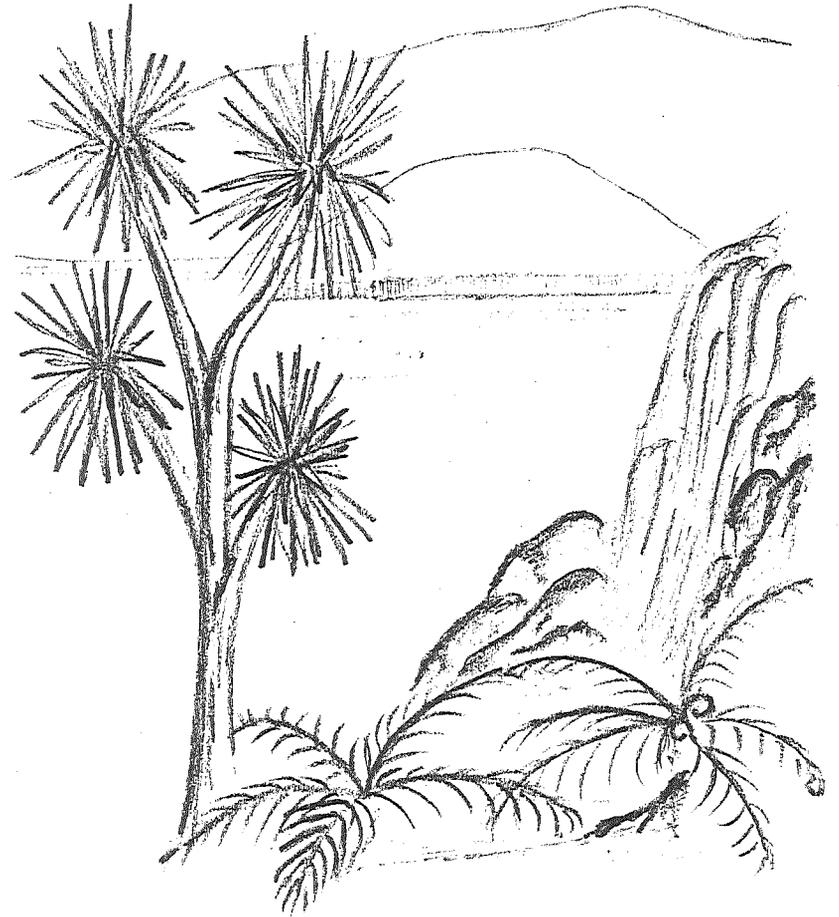
2 MOUNT PEEL STATION proposed boundary line



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KEY

-  Rangitata Gorge Road.
-  River Terraces
-  Streams
-  1982 Boundary line
-  Proposed boundary line
-  Area to become part of the Waikari Hills Run.



PART I (b)

Natural Elements Influencing the Landscape

Climate

In the diaries of J.B.A. Acland,¹ there is frequent reference to the 'nor'westers' and 'sou'westers', the two winds which brought considerable discomfort to the settlers. They are, perhaps, the most important climatic influence on Mount Peel Station.

The northwesterly wind, originally thought to be from hot, dry Australia, is a Fohn wind created by the air stream losing its moisture as it rises over the Plains. Due to its lack of moisture, the wind is hot and dry and often very strong.

This wind was also indirectly important to the residents at Mount Peel because it was observed that the Rangitata River quickly rose to flood level whenever this wind occurred. The flood was obviously due to the release of the extra water over the river's upper catchment in the Southern Alps.

The southwesterly is the station's predominant wind and often follows the northwesterly. It is this wind which brings most of the annual rainfall of 1105mm.

Mount Peel Station's warmest months are January and February, June and July are the coldest.

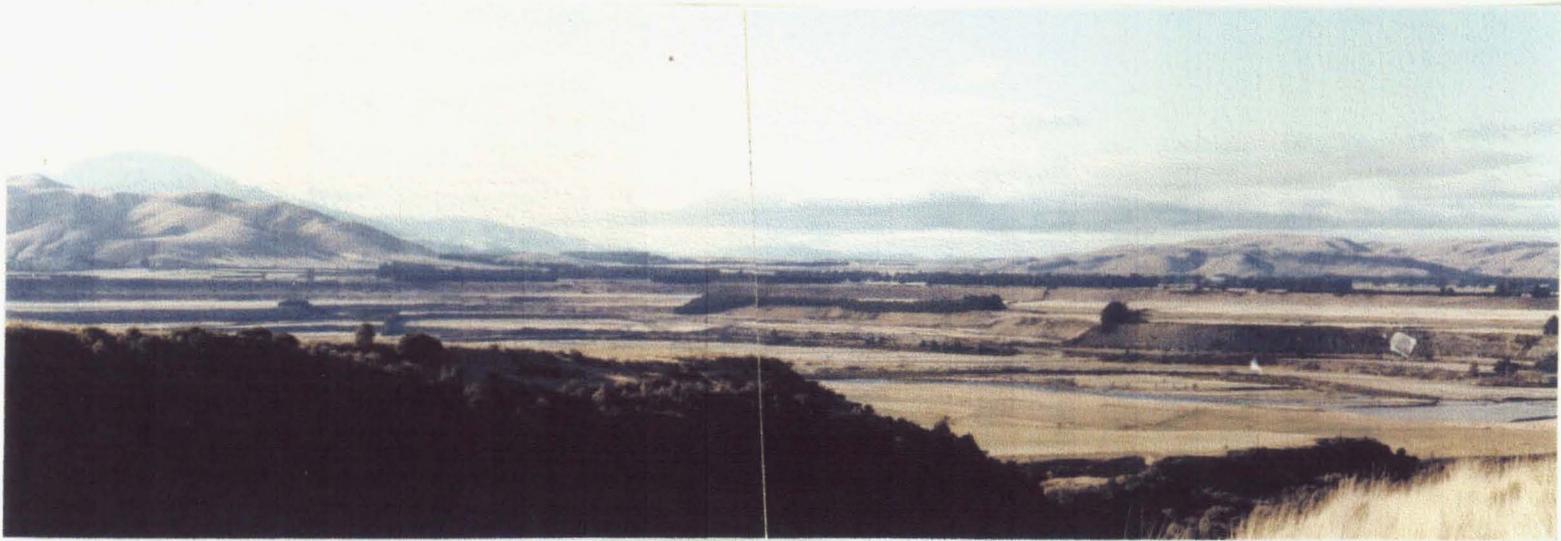
The wettest months are December and January, during these two months about 20 percent of the rain falls. June and July

are the driest months, during which less than 10 percent of the rainfall occurs.

Mount Peel Station, therefore, generally experiences warm, wet summers and cold, dry winters.

The other form of precipitation on the station is snow, which falls in varying amounts on different areas. The homestead is 305m above sealevel where it is common to get about two falls of snow, of about 75-100mm, each year. Any snow rarely lies around for more than a day or so but there does appear to be a trend for a good fall of snow of about 450-600mm every ten years or so.

¹ Acland Papers, Canterbury University Library



PHOTOGRAPH 1: The Rangitata River showing the steep north bank and the prominent series of river terraces.

Geology

The Southern Alps and their associated foothills, which abut the Canterbury Plains, are the dominant landscape features in the Mount Peel district.

Mount Peel Station covers a considerable portion of the geological formations in the area, from river terraces to alpine areas.

In the beginning, sand, silt and mudstone was washed in large quantities into the troughs of the ocean bed. Gradually faulting and folding processes uplifted a great range of alps which, during the cyclic course of nature, were worked upon by erosive forces, eventually re-joining the sea bed.

The Southern Alps we see today are the result of a second similar orogeny, and are, in their turn, being slowly eroded. This erosion has resulted in the formation of the Canterbury Plains as we know them.

During the history of the present range of alps there has occurred cyclic periods of glaciation with warmer interglacial periods. There have been at least three of these cyclic periods, the last one occurring about 14000 years ago. Together, their action, has formed much of the present landscape of the Mount Peel district.

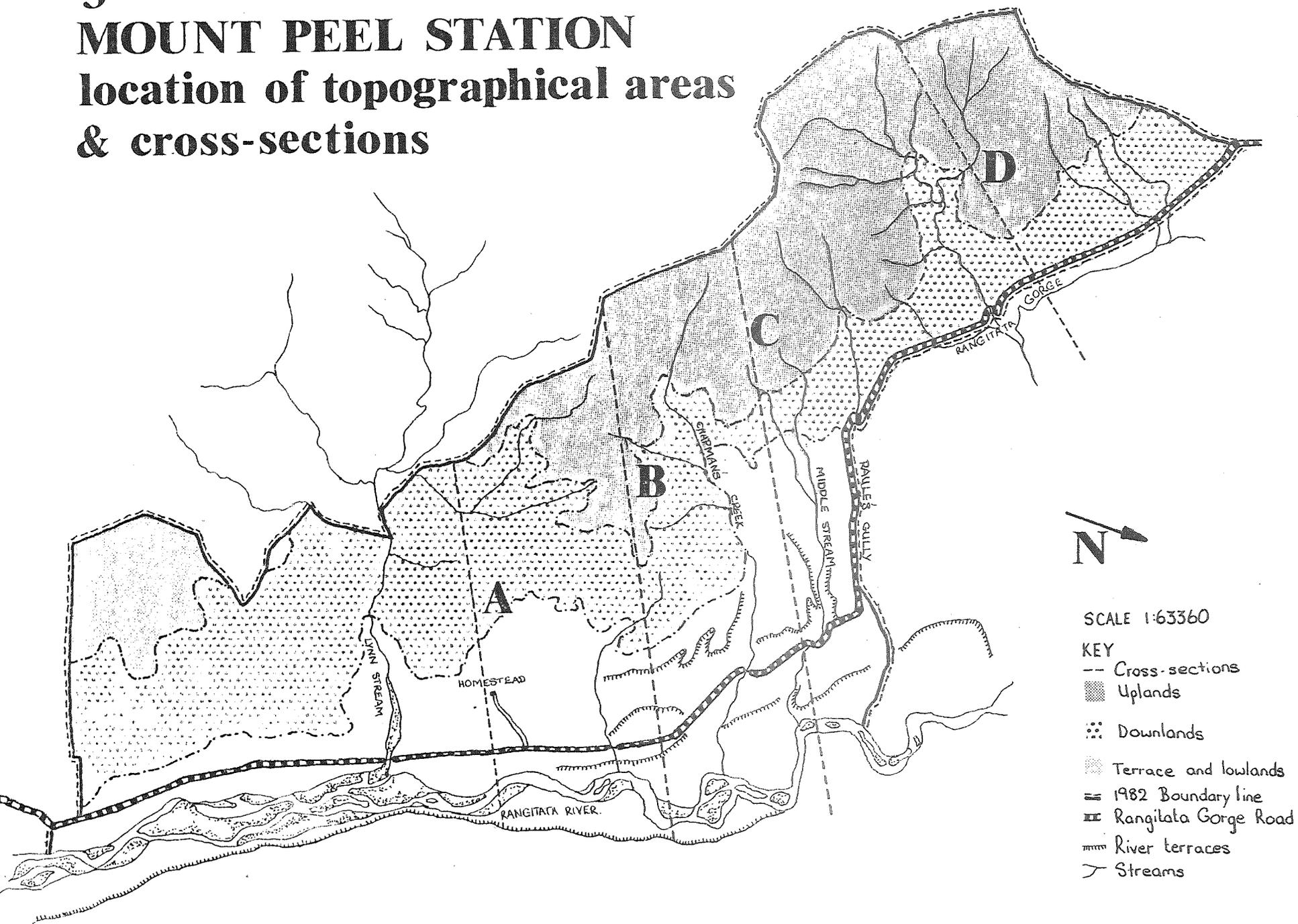
The intense cold associated with periods of glaciation caused rocks to be cracked and shattered by frost action, the debris being carried along the deepening glacial valleys and their eventual stopping

places, the morraines, are still visible today. Other signs of glacial action within the Rangitata area are, the 'U' shaped valleys with their flat floors and steep ridges, also hanging valleys and truncated spurs.

The ridge above and to the west of the Mount Peel homestead is the lip in front of the glacier that occupied the mountain valleys in the Rangitata district, up to and beyond Mesopotamia and Erewhon.

The Rangitata River is the main snow fed river in the Mount Peel area and in the past it has deposited large amounts of alluvium, contributing to the formation of the plains. Its flood waters gradually cut the narrow Rangitata Gorge and dumped the gravel downstream on the plains, where the gorge widened and water flow decreased. As the glaciers continued to retreat, the river lost a lot of its bedload and began cutting into the alluvial deposits to create the present, prominent series of river terraces.

3 MOUNT PEEL STATION location of topographical areas & cross-sections



SCALE 1:63360

KEY

-- Cross-sections

■ Uplands

⋯ Downlands

▨ Terrace and lowlands

— 1982 Boundary line

▬ Rangitata Gorge Road

▬ River terraces

∩ Streams

Topography

The topography of Mount Peel Station is variable, covering the relatively high hills in the Mount Peel range, down to the river terraces and the Rangitata river bed in the valley floor. Most of the land, however, may be classed as high country and downlands, with rolling ridges and spurs.

The tussocky lower slopes of the hills afford good pasturage, and are the mainstay of the station as a high country run. Although the valley floor is potentially all riverbed, its alluvial flats are capable of yielding good crops of winter feed.

It is possible to divide the station up into three topographical areas which relate strongly to the geology of the area, and which also influence the soils found on the station. The following section on soils has been divided into these categories.

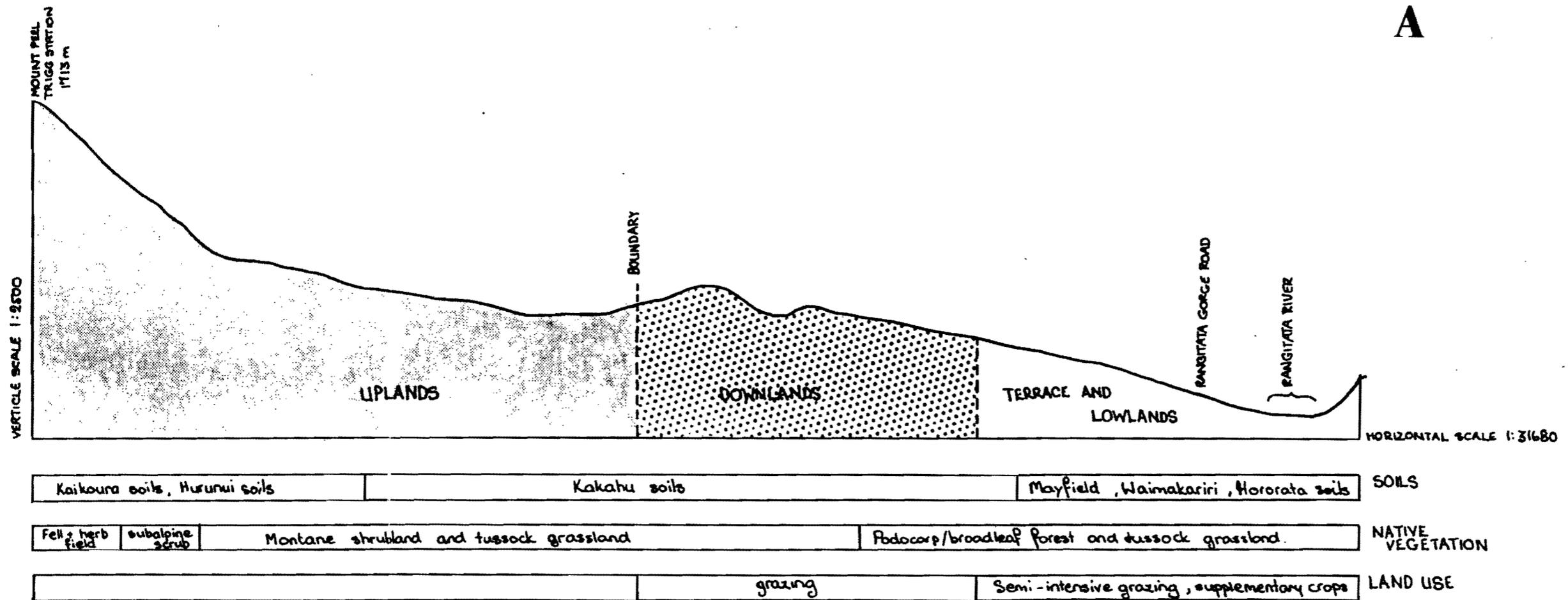
The first area is the higher hill country, which is to be found approximately above the 760m contour. It is characterised by steeper hill slopes and deeper gullies.

The second area is the downlands, between 460m and 760m, and it contains hills which are more rolling in nature with gentler slopes. Soil cover is deeper and vegetation more varied, with forest and bush in many of the gullies.

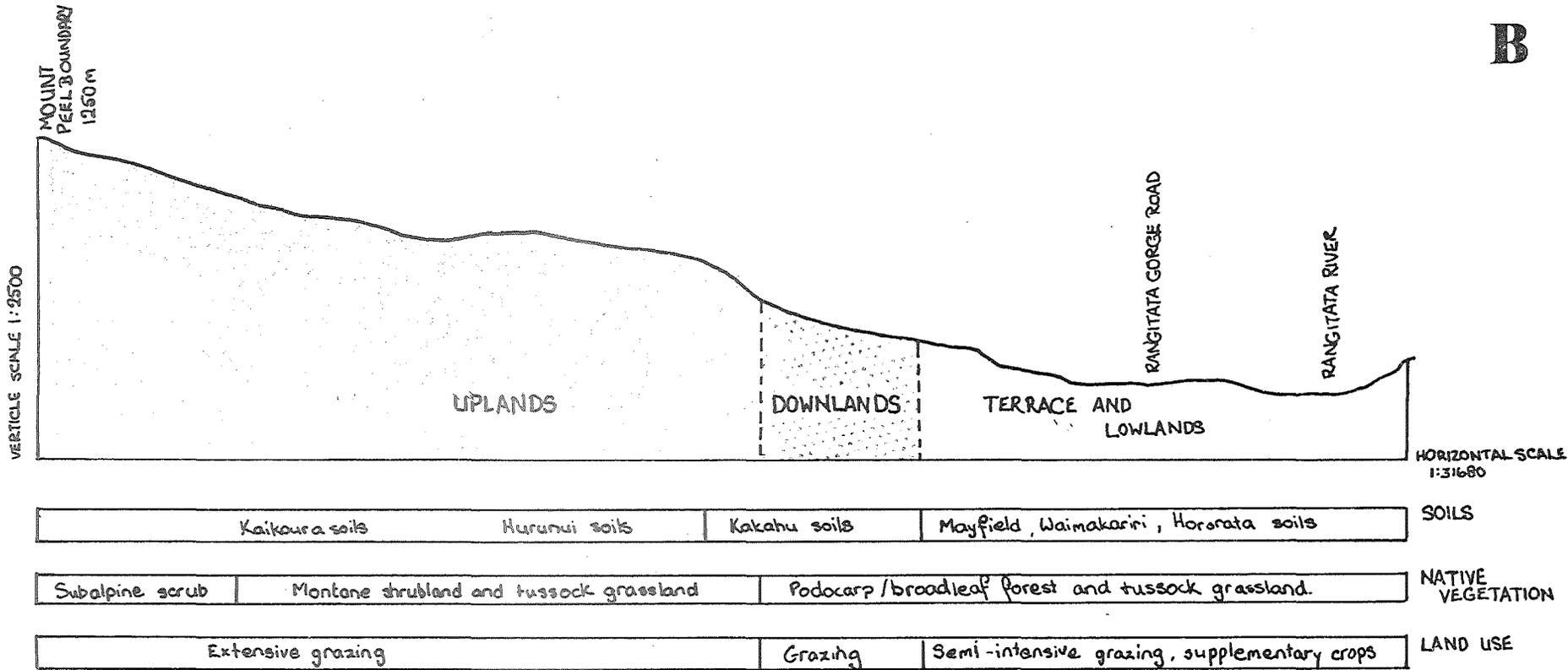
Thirdly, there is the lowland and terrace areas of the station. These include the more gently sloping and fertile land as well as the Rangitata river bed.

These categories, and their relationships to soil and vegetation, are illustrated in the following cross-sections, which have been chosen to show the range of topography throughout the station.

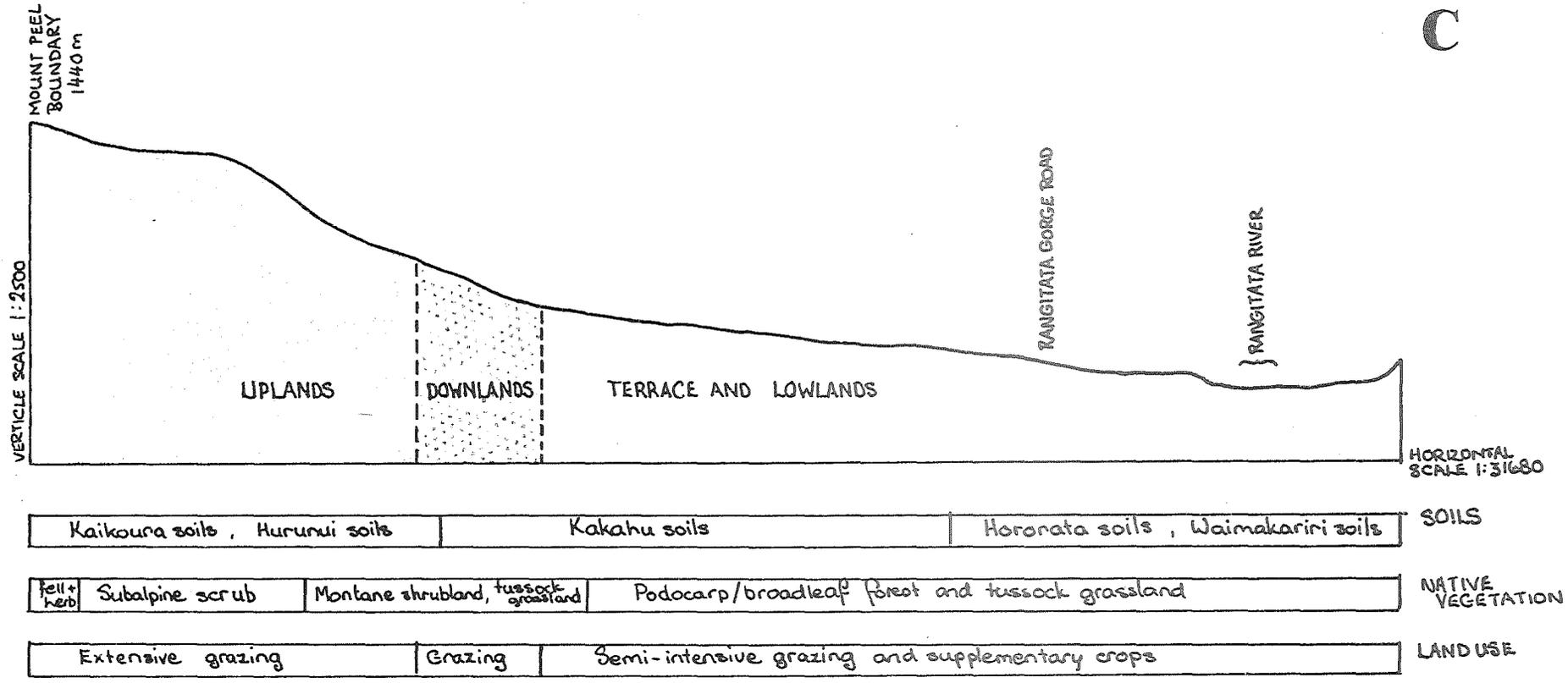
FIG. 1: TOPOGRAPHICAL CROSS-SECTIONS OF MOUNT PEEL STATION TO SHOW THE RELATIONSHIPS BETWEEN TOPOGRAPHY, SOILS, VEGETATION PATTERNS AND LAND USE.



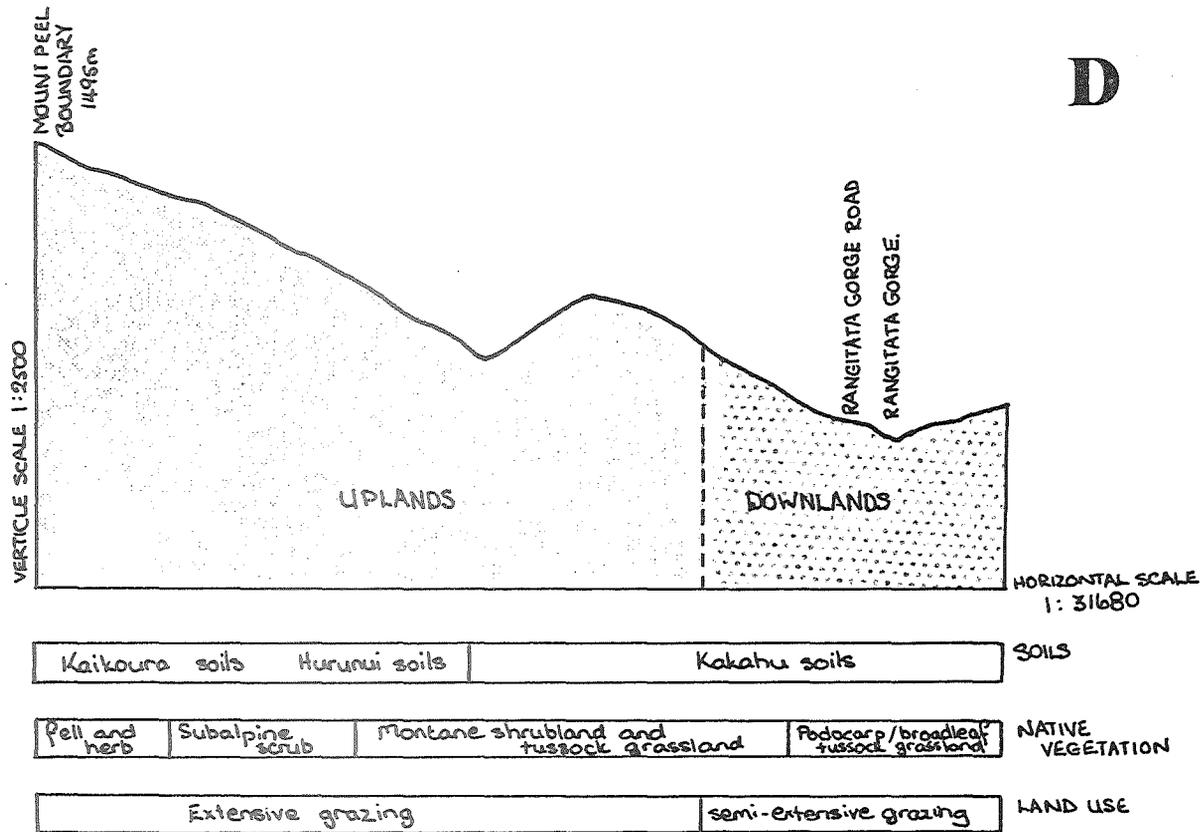
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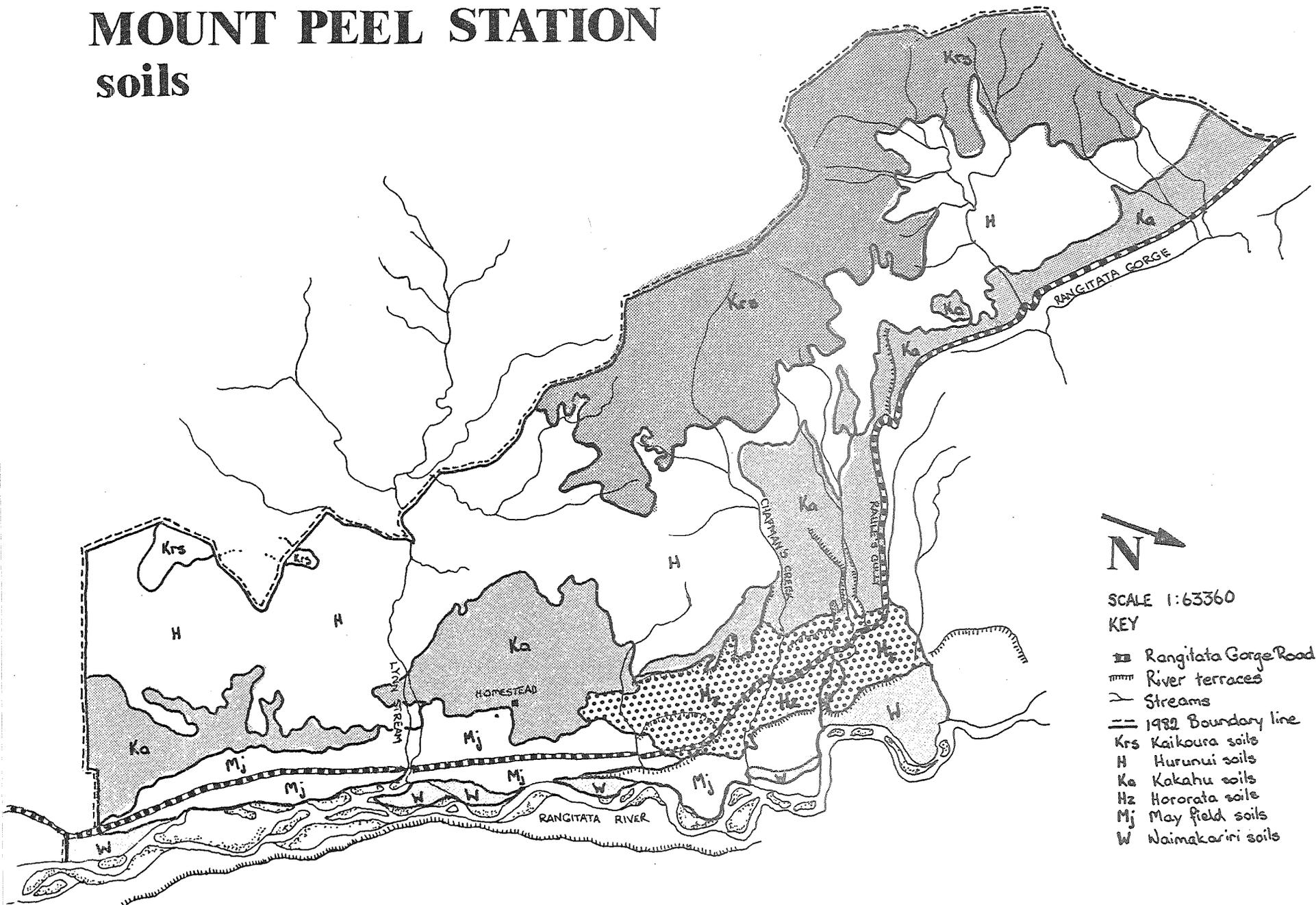
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D



4 MOUNT PEEL STATION soils



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KEY

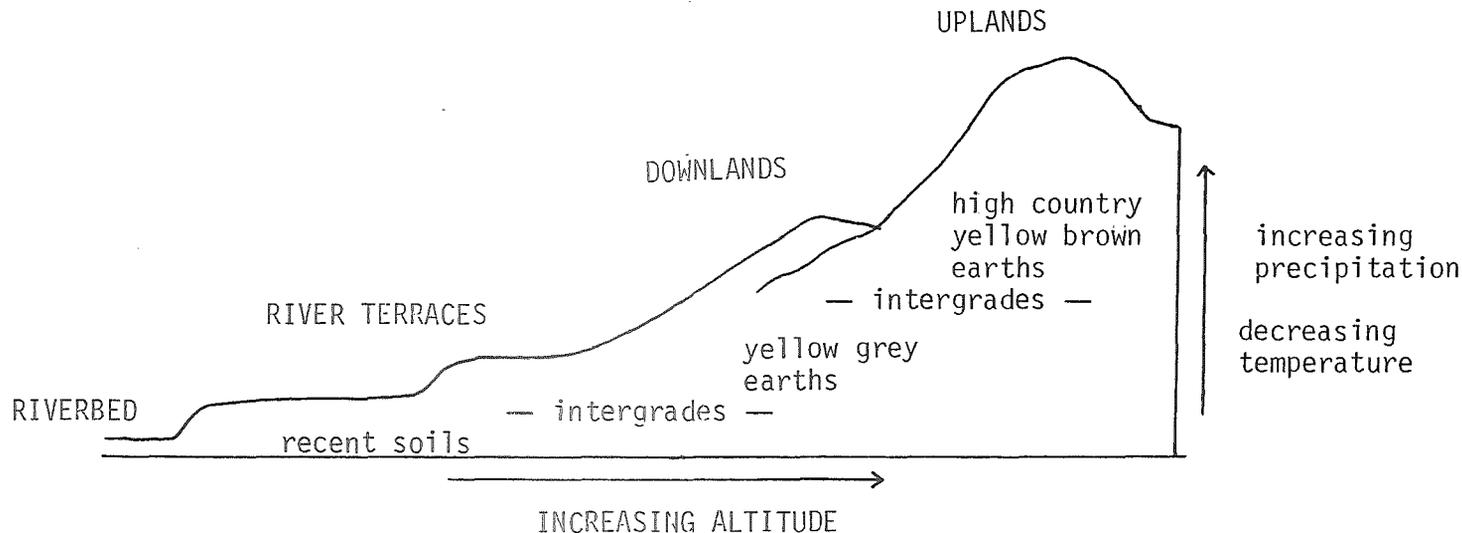
-  Rangitata Gorge Road
-  River terraces
-  Streams
-  1932 Boundary line
- Krs Kaikoura soils
- H Hurunui soils
- Ka Kakahu soils
- Hz Hororata soils
- Mj May field soils
- W Naimakariri soils

Mount Peel soils are related to the topography of the area and the influence of climate (Refer to FIG. 2) They may be divided into three categories, according to topography:-

- (A) Mountain soils
- (B) Downs soils
- (c) Terrace and bottom land soils

The following soil types will be discussed under these three categories, as it influences the uses to which the land can be put and, therefore, the present landscape at Mount Peel Station. A more detailed chart of various aspects, relating to these soil types and their use, may be referred to in the appendix.

FIG 2 : BROAD RELATIONSHIPS BETWEEN SOIL GROUPS AND CLIMATE/TOPOGRAPHY



This diagram is a very broad generalisation to help explain the relationships between the soil groups, into which the soil types on

Mount Peel Station fall, and climate and topography. Not all of the soil types mentioned will fit exactly into this pattern.

(A) MOUNTAIN SOILS

These soils are to be found above 450m and fall into two soil groups; high country yellow brown earths and lowland yellow brown earths. Mountain soils on the station also fall into two basic soil types, associated with the above soil groups. These are: Kaikoura steepland and hill soils, and Hurunui steepland and hill soils.

Kaikoura steepland and Kaikoura hill soils of the upland and high country yellow brown earths

These soils have formed on greywacke rock and loess, possibly under forest cover. By the time the European settlers arrived the vegetation cover on these soils was mainly tall tussock grassland. The development of these grasslands, by burning and grazing, has opened the soil surface to frost, resulting in erosion problems.

In the interests of soil conservation these areas, as far as possible, should be withdrawn from pasture production and put under protective tree planting, which may be of use for timber production at lower elevations.

Hurunui steepland and Hurunui hill soils of the lowland yellow brown earths

Formed mostly on deep slope deposits, these soils are mostly of a stony silt loam texture. Some of the Hurunui hill soils have been formed under broadleaved scrub and forest.

Hurunui soils are suited to exotic

forestry, as well as farming, though the conversion of extensive areas, from tussock grassland into more intensively grazed pastures, may result in hydrological problems in the lowland due to excess runoff. The present cover of tussock grassland and introduced grass species is adequate, though any existing forest cover should be conserved for soil protection.

Burning results in a predominance of browntop and some areas have been invaded by gorse and manuka. All of these soils should respond well to topdressing and oversowing.

(B) DOWNS SOILS

Downs soils are, in general, the deeper, more fertile soils found on the lower rolling hills. In altitudinal terms they are found below the mountain soils and so are not quite as exposed to climatic extremes, especially long periods of severe winter cold.

These soils consist mainly of the Kakahu soils series and, as such, they belong to the soil group yellow grey earths to yellow brown earths intergrade.

Kakahu and Kakahu hill soils, yellow grey to yellow brown earths intergrade

These intergrade soils are formed on a loess base, of varying thickness, and have mostly a silt loam texture. The hill soils in this series have shallower profiles, and on steeper sites there may be greywacke outcrops.

The natural nutrient status is low but the productive capacity of Kakahu soils can be considerably improved by topdressing. They are well suited to exotic forestry.

(C) TERRACE AND BOTTOM LAND SOILS

The soils of the terraces and bottom lands are variable in their depth, fertility, texture and moisture holding capacity.

They belong to two soil groups, recent soils and associated yellow brown shallow and stony soils. The soil types found in these areas are: Waimakariri shallow soils, Mayfield soils and Hororata soils.

Because of the relationship of these soils to the flatter topography, and because of their inherent nutrient status, they are more commonly used for growing the station's supplementary crops than most of the other soil types.

Waimakariri shallow soils of the recent soils group

Variable in texture and depth, these soils are mainly stony. They have been formed on greywacke gravels with a thin covering of loess or fine alluvium.

As they are free draining and suffer from occasional seasonal droughts, they are less productive and more suited to improved dryland farming.

Mayfield soils, recent soils and yellow grey and yellow brown earths intergrade

These soils are found on the low terraces, and are a more strongly leached intergrade.

Formed on greywacke alluvium, they are generally silt loam in texture, though some may be shallow or stony. Mayfield soils are mainly deep with good moisture retention and are, therefore, suitable for more intensive mixed farming. Though the growing season may be too short for some crops, these soils do provide a good base for pasture production.

There is a risk of wind erosion under cultivation.

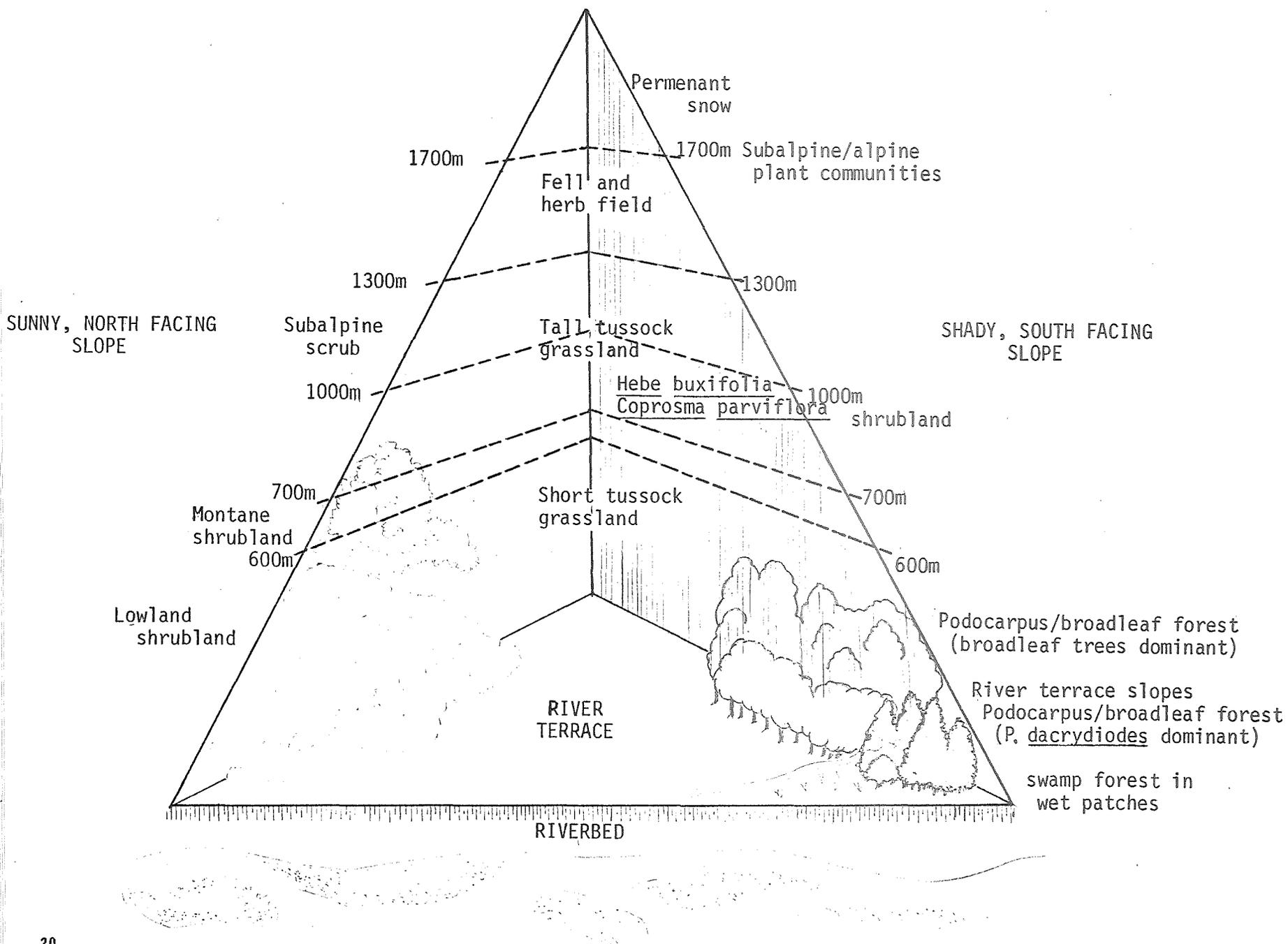
Hororata soils, associated yellow brown shallow and stony soils

These are well drained soils, found on the terrace lands and fans. They are suited to the dryland farming which occurs on this area of the station.

Some of the soils may be bouldery and limiting to cultivation but they are well suited to forestry, as an alternative to supplementary crops. Another limitation to their use is that they may sometimes suffer from short, seasonal droughts.

There is a risk of wind erosion under cultivation; as a result shelter may be desirable to protect these soils.

FIG. 3: THE NATURAL VEGETATION PATTERNS OF MOUNT PEEL



The Natural Vegetation of Mount Peel

The broad features of the vegetation patterns at Mount Peel are due to the natural interactions between, topography, climate, soils and the glacial periods.

Topography and climate, with regard to the establishment of the vegetation cover, are closely related. As the altitude increases temperature drops and rainfall increases accordingly. The aspect of a particular area also influences its microclimate, e.g. a sunny, north facing slope has a warm microclimate and will support a different type of vegetation to a shady, south facing slope. Varying vegetation patterns are, therefore, found in different topographical areas due to differences in macroclimate and microclimate.

Topography and climate also affect the soils to be found in an area. Shallow, weakly developed soils, with a lower natural nutrient status are found at higher altitudes. Different plant species are adapted to growth under different environmental conditions, including differences in soil type. As a result vegetation patterns are often related to the soil patterns within an area. In this way the patterns of the visible landscape develop, with the vegetation patterns often being the visible expression of the underlying physical aspects of the land.

(Refer to FIG. 3)

The cyclic glacial periods which have occurred throughout the natural history of the Mount Peel region, have also influenced the vegetation patterns. Whenever the glaciers were advancing the vegetation had to retreat

to areas where the climate was favourable to its growth and survival. The different species would again advance, according to their tolerances, when the glaciers went into a phase of retreat, thereby recolonising the newly uncovered land. A succession of different plant communities would then develop, according to the environmental conditions.

The last glacial period has influenced the sequence of successional vegetation in the Mount Peel region. This successional sequence may be described in three stages:-

1. Glacial conditions: with the retreat of the ice, fell field vegetation colonised the newly disturbed soils and this gradually developed into tussock grassland on the exposed slopes, with beech forest on the sheltered ones.
2. Moist climatic period: due to the increase in the moisture available for plant growth, podocarp forest developed, whilst the beech forest was replaced on all but the more exposed slopes and knolls.
3. Modified steppe conditions: the podocarp forest was able to persist due to the favourable rainfall but the beech forest diminished under pressure.

Patches of vegetation dating from earlier times are scattered through the present communities. These illustrate the changes in vegetation related to changes in climate, much like the above successional sequence. They show that plants and vegetation patterns adjust and form successional communities according to changes in the environ-

ment. The following examples are of some plant communities which developed under an earlier climatic regime; they remain today, only in those areas with a microclimate similar to the original climate in which they became established.

e.g. Dracophyllum and Hebe shrubland:
found in subalpine, snowgrass
vegetation.

Hoheria lyallii low forest:
found in stream valleys.

Nothofagus cliffortioides:
remnants of mountain beech forest.

Today there are seven broad zones of vegetation in the Mount Peel area. These will be discussed under the following categories:

- (A) Mixed podocarp/broadleaf forest
- (B) Beech forest
- (C) Shrublands
- (D) Grasslands
- (E) Fell field and herb field
- (F) Subalpine and alpine communities
- (G) River bed communities.

The general pattern of these categories is illustrated in figure .

The Mount Peel region also contains a number of rare plants, such as Gleicheria circinata var hecistophylla and Olearia haastii, in various plant communities from the herb and fell fields to forest, scrub and tussock grassland.

(For a full list of rare plants refer to a paper by H.H. Allan, 1926, pp. 87-88)

(A) MIXED PODOCARP/BROADLEAF FOREST

This type of forest is associated with areas of greater rainfall and may be represented by the forest found at Peel Forest Park. It has two basic associations, one on the terrace lands and one on the hill slopes.

On the terrace lands this forest is dominated by the high canopy of Podocarpus dacrydioides, under which are well developed Podocarpus spicatus and Podocarpus totara. Swamp forest may occasionally develop near the bases of steep slopes where there are streams.

On the hill slopes the podocarps, other than P.totara, become less common and the broadleaf trees dominate the vegetation, amongst which Grisellinia littoralis, Pittosporum spp., Metrosideros lucida and Fuchsia excorticata are common. It rises up to about 600m in the gullies.

Much of the forest in the Mount Peel region suffered from heavy milling soon after settlement and the successional sequence of this type of forest, after milling, has two characteristic features:

- 1) the entry of alien plant species, especially berried types.
- 2) the rapid growth of certain smaller trees and shrubs,

e.g. Aristotellia serrata
Fuchsia excorticata

Wintera colorata
Carpodetus serratum

Uncinia spp. and Carex spp. are especially attractive to cattle, as are certain shrubs, e.g. Schefflera digitata, Neopanax arboreum, but where the cattle do not penetrate the original forest species are able to establish and the forest progresses to something like its original condition.

Where ridges broaden out at their lower ends, near the terrace lands, plants of the stream sides move upwards. Here occurs the chief development of tree ferns, with a large number of smaller ferns underneath.

(B) BEECH FOREST

This forest type is isolated from the podocarp/broadleaf forest and occurs at higher elevations. It is felt that it is a remnant from a previous climatic era, as it closely resembles the climax forest of Canterbury's eastern mountain ranges.

(C) SHRUBLANDS

Shrubland communities in the area vary from very open communities to dense thickets and scrub but the majority have been highly modified by fire and grazing pressures, with many being reduced to small areas.

The shrublands found in the Mount Peel region may be classified into five main groups:

1) River terrace and debris shrubland

This group covers from lowland shrubland, where the dominant plant species

are Coprosma parviflora and Discaria toumatou, to the montane shrubland on the coarse debris, near streams at about 600m, where Olearia nummularifolia and Coprosma propinqua are dominant. The subalpine scrub found on the debris slopes at about 1000m, has Coprosma parviflora and C. propinqua as the dominant species, with large open mats of C. ramulosa between.

2) Hebe buxifolia - Coprosma parviflora scrub

This group occurs on the shaded slopes between 700-1000m and is sometimes developed from the subalpine scrub described above. At one time this type of scrub was more extensive but it has been reduced by fire.

3) Leptospermum shrubland

In a succession from grassland this type of shrubland may develop into Leptospermum thicket or open shrubland after fire. Both L. scoparium and L. ericoides invade the burnt areas, with Dracophyllum invading the shadier slopes.

L. scoparium may also form an association with Exocarpus bidwillii on broken, rocky outcrops, at the higher limits of the short tussock grassland. This association may be open or closed.

4) Dracophyllum shrubland

There are three types of this group of shrubland. D. longifolium thicket exists up to about 900m, where it is

replaced by D. uniflorum shrubland on the rocky buttresses and steep slopes. On the exposed slopes of Middle Peel there exists the third type, D. rosmarinifolium dwarf shrubland, in more or less extensive patches in the fell field and intergrading with it.

5) Cassinia open shrubland

This association is indigenous induced after burning, with Cassinia fulvida and C. vauvilliersii occurring in marked amounts, to form an open shrubland.

The forest, at its upper margin, blends either into tall tussock grassland by way of a narrow zone, or, into one of the previously described shrublands. On certain broad ridges, the mixed forest is succeeded by a rather extensive plant association in which Senecio elaeagnifolius is dominant, with a few other shrubs.

(D) GRASSLANDS

Both short and tall tussock grassland are well developed at Mount Peel. The distribution of exotic plants is of importance, with regard to this zone of vegetation, because of its economic significance.

Apart from the subalpine Chionochloa rigida grassland, all other grassland communities have developed either within the last 1000 or 100 years. The major communities may be recognised by the dominant species.

1) Festuca novae zelandiae and Celmisia

spectabilis with scattered Chionochloa rigida or C. rubra.

This is a recently modified community with a large adventive flora, especially grasses.

2) Chionochloa rigida grassland community

This grassland community has tall overlapping tussocks in between, with grass litter and shade tolerant, native species and introduced herbs underneath.

3) Chionochloa rubra grassland

This type of grassland is to be found mainly in the wet depressions and on some shady aspects. Together with snowgrass and induced short tussock grassland, it forms a mosaic on the terraces and glacial moraines.

In wetter situations red tussock grassland merges into Schoenus parviflorus and finally Carex secta, dominated by swamp communities where Cortaderia richardii may also be prominent.

Short tussock grassland is common to about 600m where it merges into, and is replaced by, tall tussock grassland forming a broad zone between 700-1300m. Above this it fades into fell and herb field.

There is a difference between the grassland communities found on sunny and shady slopes. Those communities on the sunny slopes tend to be more open than those on the shady slopes. On isolated and windy slopes low tussock grassland may extend up to about 1000m, while on the steep shady slopes tall tussock grassland may descend

to 300m. The composition and the type of grassland found in any situation, therefore, varies in accordance with changes in slope and aspect.

The larger streams found within the grassland have their banks covered with gully forest, e.g. Lynn Stream, while beside the smaller streams this is reduced to a thin, shrubby margin.

(E) FELL AND HERB FIELDS

The fell fields in the Mount Peel region extend from the upper limit of the tall tussock grassland to the highest peaks. Herb fields, in their true form, have only developed to a limited extent.

There are several distinct plant associations and intergrades within the fell field.

e.g. Celmisia lyallii association
Celmisia viscosa association
Poa colensoi association

The herb fields are dominated by Celmisia lyallii with many of the fell field plants also being abundant. This type of community is characterised by its closed nature and the variety and individual abundance of its herbs. Woody plants are infrequent and streamsides are much richer in plants than those in the fell field.

(F) SUBALPINE AND ALPINE COMMUNITIES

These are found on the higher rocks at about 1700m, and near the peaks of the mountains in the Mount Peel region. The following plants are common in these

communities:

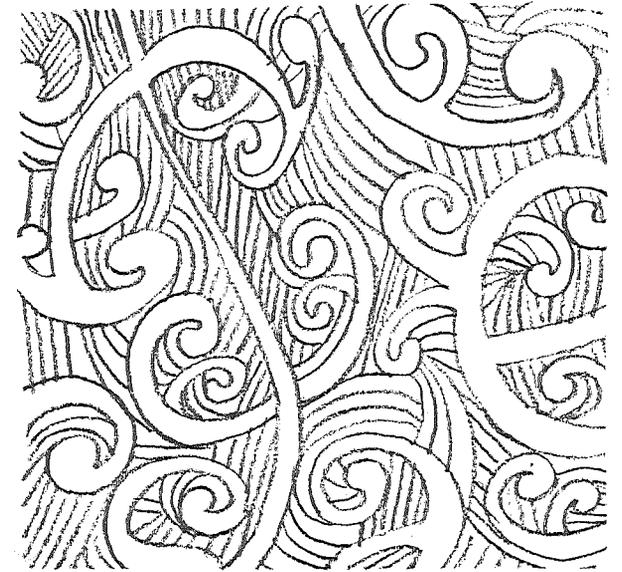
Danthonia setifolia
Agrostis subulata
Poa colensoi
Colobanthus acicularis
Exocarpus bidwillii
Dracophyllum rosmarinifolium
Hebe cheesemanii
Raoulia eximia
Leucogenes grandiceps
Celmisia incana

(G) RIVERBED COMMUNITIES

The Rangitata riverbed is characteristic of the large Canterbury rivers, with a braided river channel containing swift streams, bordered by large boulders and flood plains, and backed by steep terraces. Natural successions from the riverbed consist of:

- 1) open communities of Raoulia spp. and Epilobium spp.
- 2) Discaria toumatou shrubland
- 3) Coprosma shrubland, or low tussock grassland.

Gorse and broom have formed extensive introduced communities, becoming quite a weed problem. They have become naturalised communities, covering large portions of the riverbed and spreading into the surrounding grazing land.



PART I(c)

The Polynesian Influence on the Natural Landscape

The evidence found in the landscape when the Europeans first arrived, suggested that the Canterbury Plains were once well forested and not the grassy plains and hill country that was evident at settlement. This evidence lies in the charred logs and soils which were found on the plains, and also in the forest remnants in the valleys of the highcountry, bordering the plains. Some forest patches were still surviving on the plains themselves but these were very few. Banks' Peninsula was, 'for the most part covered with dense forest and containing some fine timber.'²

A paragraph from J.B.A. Acland's notebook describes the charred remains of what must once have been a great forest:-

'There is another curious feature about the Canterbury Plains, the entire absence of timber with a few exceptions. This is more remarkable because from the great amount of charred wood lying about the plains have probably at one time been nearly covered and it is difficult now to say how it has been destroyed but most probably by the natives...'³

Speculation continues today as to how these forests were destroyed but it is generally postulated that it was the result of a change in climate and the burning of the forest by the polynesians.

² J.B.A. Acland's notebook, dated 1854:
Acland Papers, Canterbury University
Library

³ Ibid

Today the theory of the arrival of Maoris in New Zealand with the 'great fleet' is considered to be somewhat of a myth and that accidental arrivals are more probable. Two different types of culture developed in the two islands of New Zealand. The South Island was probably less densely vegetated, and not undergoing the same volcanic activity as the North Island, so it was more densely populated by the new Polynesian inhabitants - the moa hunters. This race relied on hunting for their food and their main prey was the large moa, plus its smaller relatives.

The moa hunters used fire widely and whether the fires that destroyed the forests were intentional or accidental can only be speculated upon. The first fire may have been accidental, and under the northwesterly conditions experienced today it is easy to see how destructive it could have been.

Once the results of fire became apparent it may have become a useful tool to the natives. It removed the scrub and spiny vegetation which made cross country travel difficult, as well as being useful in driving the moas from the forests as they became fewer in number and harder to hunt.

The landscape must have changed markedly during this period but the moa hunter was also destroying his main food supply and its habitat. He gradually became more reliant on the food sources found around the coast, shellfish, fish etc; with excursions into the inland part of the island to hunt the few remaining moas. In the North Island a different culture was developing, based on horticulture; this eventually spread

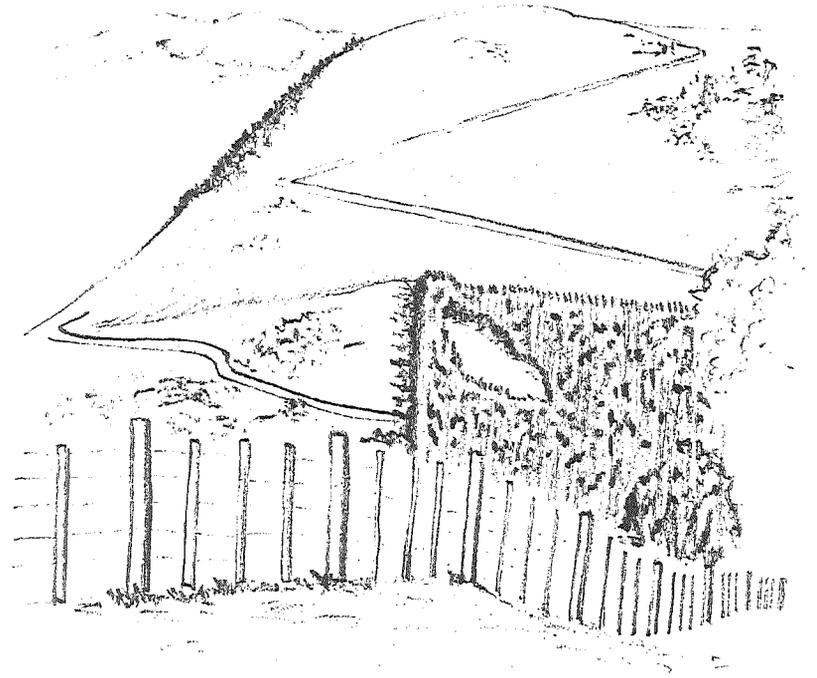
south until the moa hunter became integrated into the new lifestyle. The native population then became concentrated in the north where the climate was more favourable.

At the time of European settlement the eastern part of the South Island, and the plains in particular, had changed considerably. Forests had disappeared, and along with the change in habitat there had been a loss of about 40, or more, native bird species. It was a new landscape which greeted the settlers compared with that which had greeted the first polynesians. How much of this is directly attributable to the moa hunters is debatable because, as stated before, it is felt that the forest was already declining due to subtle climatic changes from damp conditions to a warmer, drier climate. The moa hunter probably just helped the change to occur in a shorter period of time.

"The plains though generally quite desolate are at times quite beautiful. In spring parts are perfectly white with the blossoms of dwarf manuka and other parts yellow with what is called wild onion...'

J.B.A. Acland⁴

⁴ Acland's notebook, dated 1854:
Acland Papers, Canterbury University
Library.



PART II

Station Development and Agricultural Practices

PART II (a)

Early Station History

J.B.A. Acland, along with C.G. Tripp, became the founders of Mount Peel Station. They arrived in Lyttleton, New Zealand, on the 5th January, 1855, four years after the first four ships.

John Barton Arundel Acland was born in Killerton, Somerset, in 1823. He was educated at Harrow and Christchurch, Oxford, where he took a Bachelor of Arts, with honours in maths, in 1845. He studied law and was called to the Bar, where he served for a while before becoming interested in the colony of New Zealand; after meeting Charles George Tripp.

The two young men, Acland was 31 and Tripp 28, decided to try their fortune in the new country but they had to overcome considerable family opposition. Acland finally made an agreement with his father; he could come provided that he did not enter into any serious business dealings for at least one year. He was also required to return to England for a visit at the end of the second year.

Before commencing their trip, Acland and Tripp consulted with J.R. Godley, who had been the English agent for the Canterbury settlement, as well as talking to Sir George Grey and Bishop Selwyn. They then booked passages on the 'Royal Stuart' at a cost of £85 each. They took with them what they would require for the journey and what was needed for life in the new colony. While Acland took £2,000 capital, Tripp took goods which he planned to sell, on arrival in New Zealand, to raise his capital. After a voyage of 87 days, which was con-

sidered a quick trip, the two arrived in Lyttleton.

In order to gain practical experience in farming, they decided to take up cadetships with the local farmers. Tripp paid £25 to work as a cadet with M.J. Burke of Halswell and Opihi River, near Timaru. Meanwhile Acland paid £30 to work with H.J. Tancred of Malvern Hills Station. They also found time to travel around Canterbury, taking any opportunity to watch, and assist in the various activities required in sheep farming.

During March they had their first opportunity to visit South Canterbury. Travelling with Burke to his Opihi Station, Acland and Tripp contemplated the hills beyond the forest, and its suitability for raising sheep. When enquiring about these hills they were told that only wild pigs inhabited the country; Tripp then surmised that where pigs could live so could sheep. From then on Acland and Tripp decided to explore the likely hills, and this they did in the following spring.

Though Acland's year, before entering business deals, had not yet expired and so he could not buy land, he was able to apply for a license to a pastoral run as this did not commit him to anything but the possible loss of the £10 fee. The license was not effective for three months, and the run was then required to be stocked within six months or the fee would be forfeit.

The two men felt an increasing urgency to make such an application because most of the

land on the Canterbury Plains had already been occupied, and the hill country was under increasing pressure from prospective land owners. They were sure that if they did not act soon they would not be able to get a reasonable amount of land with which to begin their own sheep run.

On the 30th July, 1855, Acland lodged an application at the Christchurch Land Office for a run which was about 80 miles south west of Christchurch and about 40 miles from the sea, in the fork of the Rangitata.⁵ This license did not become operative until October and he then had until April to make his final decision. Tripp had already applied for a run in the same locality, neither were discouraged by the fact that they had not yet seen the land, or that it had not even been surveyed.

The descriptions of the properties were as follows:-

J.B.A. Acland - '57,500 acres. Bounded on the north by the snowy mountains on the east by the base of Mount Peel and the mountains extending therefrom in a northerly direction and the Rangitata, on the south by the runs of Messrs Jollie and Cox, and on the west by the snowy mountains.'⁶

C.G. Tripp - '57,500 acres. Bounded on the north by the snowy range, in the east by the Rangitata to the forks,

⁵ Acland's diary, Acland Papers, Canterbury University Library

⁶ Anderson, C.T., 1942/43: Acland Papers, Canterbury University Library

thence the east branch of that river so as to include the country in the forks on the south of Peel Forest, on the west by higher range of the mountains running in a northerly direction from Mount Peel.'⁷

It was at this time that the first suggestion of a partnership between Acland and Tripp was made.

They left in early September, 1855, to explore the country; travelling part of the way with Burke and then planning to travel up the north bank of the Rangitata River, crossing at the forks and then up the south bank. After their previous travels around the country they were well aware of their needs and were therefore well equipped. At an early stage on this trip, they experienced the typical Canterbury 'nor'wester', followed by the 'sou'wester', and their first view of Mount Peel was a snowy one.

On reaching the Rangitata River they found the banks very steep and managed to get down to the river via a steep, stony gully, almost opposite the present Mount Peel homestead. The trip to this point, across the Canterbury Plains, must have been very difficult, as the plains were a featureless grassland and it was easy for people to get lost without well marked tracks to follow.

They found Mount Peel country wild and broken, the terrace lands had impassable swamps, sheer ravines and deep gullies.

⁷ Anderson, C.T., 1942/43: Acland Papers, Canterbury University Library

The natural matagouri scrub and spear grass made travelling difficult for both men and horses, but Acland and Tripp kept going, burning as they went.

The first of the fires that the two men lit on their land, was very destructive. It could be seen from 98 kilometres away, and Acland was said to have written his diary that night by the light it cast, over 2 kilometres away. As the earth cooled they sowed clover seed in the ashes. It was estimated that they burned approximately 20,000 hectares on this trip.

Though they had to return to civilisation, Acland and Tripp had seen enough of the land to be assured of its potential; it was fertile, it had a plentiful supply of water and there was a supply of timber at Peel Forest.

On their return to Christchurch they lodged fresh run applications based on their new knowledge.

Between their first and second trips to Mount Peel, Acland and Tripp harvested a crop of self sown wheat from the site of what is now known as the Government Railway Workshops in Addington. They also bought sheep with a view to stocking the runs they had applied for.

By 2 October, 1855, they were back up-country and on this day they reached a point where they could see clearly up the Rangitata Valley but further progress was prevented by the Rangitata Gorge. They also spent one Sunday choosing a site for the homestead; it was important that there was wood close by,

as well as being fairly centrally situated on the run.

On this trip the men also found a route around the Rangitata Gorge and then explored further up the valley, reaching as far as Mesopotamia Flat. Again they burned and sowed grass seed as they went, the matagouri, sometimes as tall as four metres, and the spear-grass burning readily.

By the 20 October their supplies were low and they returned to Russell's at Gawlor Downs. While they had been away the weather had been wet and the neighbouring stations had experienced a snowfall which had missed the Rangitata Valley. This fact highlighted the climatic suitability of the area for a sheep run as it held the promise of good winters.

Acland began to get politically involved in the Canterbury province and he was a strong supporter for the appointment of a Bishop. He also undertook work collecting information for a census held on 13 January, 1856.

By early March, Acland and Tripp were again exploring their run country. On this trip they met Abner Clough who was to become a long standing and valuable employee at Mount Peel Station.

By this time the grass and clover they had sown on the earlier trips was growing well and there was plenty of sheep feed. They now set about exploring the north bank of the Rangitata River and discovered lakes Acland and Tripp. They also burnt and over sowed this new country, reaching as far as the confluence of the Havelock and Clyde

Rivers in the Rangitata headwaters.

Acland and Tripp returned to Christchurch on the 28th May and again ammended their applications for runs. On the 1st April new land regulations were to be enforced and as the two men wished to hold their runs under the old regulations; they had to complete their arrangements for possession before this date. In a letter, dated 28 March, 1856, Acland describes the extent of their holding to his family:-

'We have taken out the moderate quantity of 115,000 acres between us, about 180 square miles.... The two runs have been taken out in such a way that we shall be able to have only one home station at first and stock both runs from that point.'⁸

By the end of April the livestock they had bought, to stock the runs, consisted of 140 lambs (6-12 months old), and 230 ewe lambs (4-12 months old). They had also bought 96 hectares of land at 10 shillings per 0.4 hectare on the west bank of the Rangitata river, north of Peel Forest.

The partnership between Acland and Tripp was now established, and dates from April 1856, with the partnership deed agreed on at £2,000 per partner. They purchased more stock, bullocks and stores and employed a shepherd, Robert Smith, and with Sharp as a cadet, they left on the 26th April 1856 to truly establish their station.

⁸ Acland Papers, Canterbury University Library.

Navigation of the plains at this time was difficult because there were no local landmarks. The travellers used to head towards a prominent hill or mountain, or other permanent features in the landscape. Travellers eventually formed tracks which, in many cases, form the basis for our roads today and which still head toward the same landscape feature.

Acland and Tripp used to travel ahead of the others, until they found some recognisable feature, and then they would light a signal fire for the others to follow.

Not only was there a lack of landmarks on the plains but there was also a lack of fences. As a result, considerable time was spent every morning trying to catch the eight bullocks which made up their team.

When they reached the Rakaia River it was low and so the bullocks were able to drag the dray across but by the time they reached the Rangitata River it was in flood and the travellers had to wait for a week before it was fordable. They finally crossed the river on the 8th May, 1856 and reached the site where they were to erect the first house.

Within a week the site had been cleared and building had commenced.

Acland and Sharp left Mount Peel on the 13th May to return to Christchurch to collect the stock, with which to establish the run. They drove them back to Mount Peel and spent several days crossing the Rangitata River.

During the early establishment of the run

there were a number of problems, their main one being the unpredictable nature of the Rangitata River. In the summer of 1856/57 the river rose higher and flooded longer than other years which meant there were times when supplies were short. Until the vegetable garden was established, the lack of fresh fruit and vegetables was especially significant.

At this time Acland and Tripp dealt separately with the land office, including the time when they applied for extensions to the stocking deadline. This had enabled the two men to acquire more land on runs not quite adjoining, allowing the less fertile area of Mount Peel itself to be left out of any applications. The problem was stocking the extensive area of land they now controlled; they applied for an extension to the stocking deadline due to:-

- 1) the amount of rough ground not yet burned and developed
- 2) the diseased sheep on neighbouring runs and the possibility of contaminating their own flocks if put onto the outer parts of the runs.
- 3) that if delayed until Christmas, shearing would be completed and it would be easier to swim the sheep across the Rangitata River.

Other problems were to develop later. The lack of fencing, resulted in mustering problems and difficulty in controlling lambing times. Shearing was hampered by a lack of protection from the weather, as well as a lack of labour. Wool washing and the transportation of wool to sale, also

presented problems to the two new sheep farmers.

Eventually things began to run more smoothly and the foundations for a successful high country sheep run were completed. By 1858 a new house was under construction and a second, with farm buildings, was planned. There was a punt for navigating the crossing of the Rangitata River, as well as, stockyards, woolshed, and a good vegetable garden.

The Forest had been recognised as a valuable resource and both men gave a great deal of thought as to the best method of logging. Professional sawyers were employed.

In March, 1857, Acland had left Mount Peel Station and sailed for England, as he had promised his father. While he was away he gave a lecture on sheep farming in New Zealand; in it he offered encouragement to any man who wished:-

'to improve his condition by finding and making for himself a new home in a new land, and as a true colonist, be prepared to cast his lot in with the fortunes of his country, be that what they may.'⁹

On his return to Mount Peel, in January 1859, he found Tripp married to one of the daughters of Bishop Harper, and the station:

'considerably improved, a small weatherboard house with 6 rooms

⁹Acland's Lecture, 1858: Acland Papers, Canterbury University Library.

and a verandah where Mr and Mrs Tripp lived. The original old hut and whare were given up to me for my bachelor establishment.¹⁰

Later on, in 1862, the partnership finally dissolved due to:-

'our positions now being so much altered from the bachelor state in which we had been when we started that we mutually agreed that we had better dissolve and divide our runs which we accordingly did.'¹¹

Acland took possession of Mount Peel Station and Tripp took over Orari Gorge Station.

¹⁰ Acland Papers, Canterbury University Library.

¹¹ Ibid.

PART II (b)

Agricultural Practices Affecting the Appearance of the Landscape

Burning and Pasture Development

A BURNING

The extent to which Acland and Tripp fired Mount Peel country has already been mentioned. Such a practice was necessary in the early establishment of the station in order to improve the grazing. By burning, the accumulated mass of rough vegetation was removed, encouraging renewed tussock growth which was more palatable to the stock. It also enabled the establishment of the exotic clovers and grasses which were sown into the ashes.

Early burning was done indiscriminately, as necessity dictated. There was no knowledge as to the effects on vegetation, soil and wildlife and it was some time before burning became a practiced art, used only when weather and soil conditions were optimal. Tripp advised burning in August under favourable weather conditions, as the soil was then damp.

Burning on the station was to affect the landscape in terms of the removal of some forest and the change in vegetation cover on the station. It removed the matagouri and the speargrass, as well as, changing the nature of the tussock species. As an effect of the oversowing, the colour of the landscape would also change, becoming greener than the rusty browns of the natural tussock cover.

On the more susceptible, higher slopes erosion problems also began to appear, though these are of little significance on the actual run as it exists today.

Burning, as a management practice today,

can only be done with a permit obtained from the South Canterbury Catchment Board. It is only used to clear scrubland, especially matagouri as the sheep have difficulty in getting through the vegetation, and only in places where it does not adversely affect the soil and natural vegetation.

B THE PATTERN OF LAND DEVELOPMENT

There appears to be a pattern in the way various parts of Mount Peel Station have been developed. The first land to be developed was on the higher terraces, mainly those with Kakahu soils. Development has since moved further towards the river and along the front of the station, from west to east.

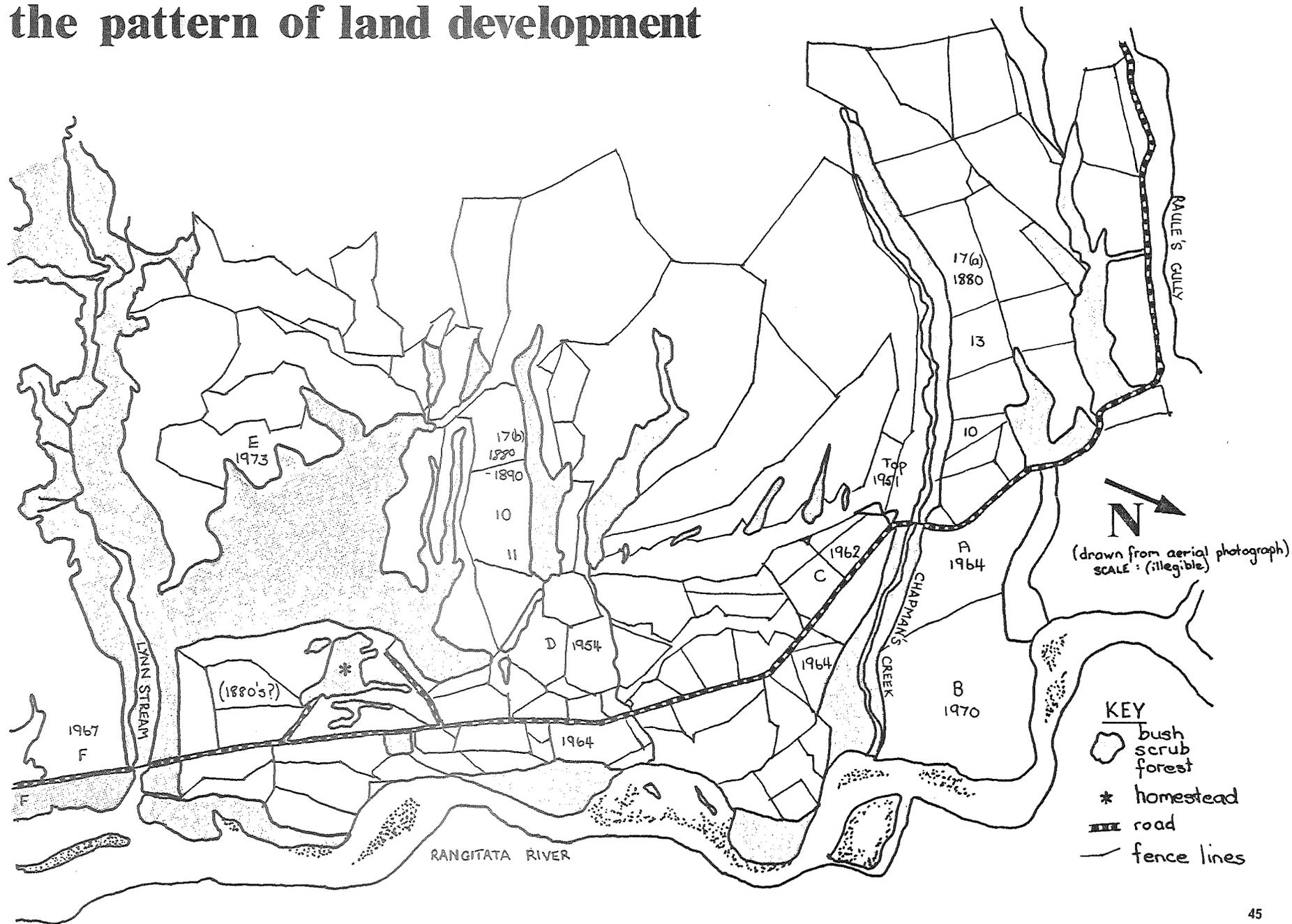
This pattern can be followed on the accompanying map, the numbered paddocks having their development traced in the following list.

Paddock number	Date of development and type of development
17(a)	First developed about 1880. Recent developments saw it refenced in 1950, probably not along the old boundary lines. It was ploughed again in 1958.
13	In 1954 this 30 hectare area was divided into 4 paddocks.
A	Broken in from the native country in 1964 it was sown in pasture in 1966. There has

Paddock Number	Date of development and type of development
	been no further development in this area.
B	This country was broken in, in 1970 and sown down into grass in 1972.
C	Development in this area has followed a similar pattern, being developed from top to bottom. 1951 Top paddock - it had not been ploughed earlier due to a lack of access. Ploughed again in 1966. 1962 middle area developed. 1964 area on the other side of the road developed. 'F' = forestry. 'G' = gorse covered land to be developed for forestry.
17(b) 10 11	Ploughed in the late 1880's and 1890's. These paddocks were again ploughed in 1949.
D	This river terrace is a better area for development but it was not developed until 1954. The area across the road was developed in 1964.
E	This area was not developed until 1973 because of a gorse problem.

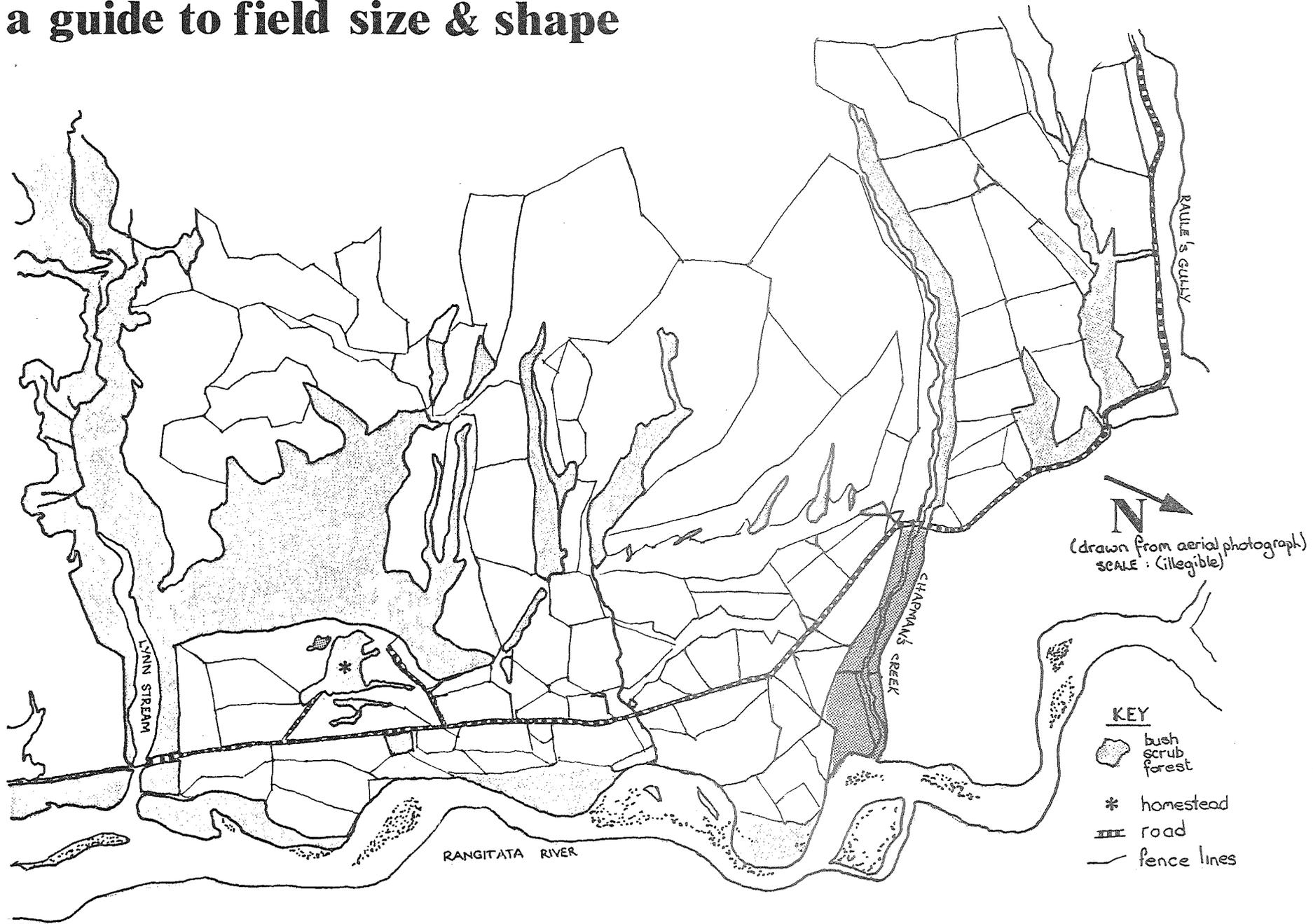
F	This area is south of the Lynn stream and development began in 1967. Development was to take 5-7 years. The area had never been cultivated before due to the boulders.
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5 MOUNT PEEL STATION the pattern of land development



6

MOUNT PEEL STATION a guide to field size & shape



Field Size and Methods of Enclosure

(A) Field Sizes

When Mount Peel Station was first established the only fences were those intended to keep livestock out and so the area, including a large part of the Canterbury Plains, was just one large paddock.

Field sizes have decreased during the development of the station, due to land development and the subsequent increase in productivity. Different areas are more suited to development and as a result changes in field sizes vary within these areas.

In the upland hill country the field sizes of the present day are similar to those of the past. As the soil cover is very thin, it is unable to support large amounts of vegetation for browsing animals. As a result the tops of the hills remained ungrazed and the rest of the area is poor grazing land with limited production potential.

Development of these areas would not only be difficult in terms of labour and cost, it may also upset the delicate soil equilibrium. Exposure of the soil surface to frost action may lead to erosion problems. The downland areas of the station are suitable for development to increase pasture production. The soils in these areas have deeper profiles and are able to withstand higher levels of grass production, and subsequent grazing pressures. In most places the land is more rolling and less steep, so inherent erosion problems are not as serious, though they may be aggravated by bad management.

As a result development in the downlands area has been widespread and field sizes

have been subsequently reduced for better management. As an example, one paddock in the lower tussock country has been divided into nine smaller, more productive ones since 1960.

Similar dissection has occurred on the lower terrace lands, for similar reasons. The soils on these parts of the station have evolved from different parent material and tend to be more fertile. Due to their location on the comparatively flat land, they are most suited to development for more intensive use. As a result the changes in field sizes has been marked, for example, since 1960 one paddock has been divided into 20 smaller ones.

Subdivision means that the higher productivity can be better utilised, increasing the efficiency of the land available. It has increased in the later period of station development because methods available to increase production, have improved with improvements in technology. These improvements will be discussed in more detail later under the heading 'technology.'

(B) Methods of enclosure

Fields require fencing and the increase in the numbers of fields created a need for easily constructed and durable fencing.

It has already been stated that there were few fences within the Canterbury province. This was due to two reasons:

- (1) there was a limited number of stock, and in the early years it was there-

fore, easier to keep stock out than to keep it in.

- (2) there was a lack of timber for the post and rail fences which were constructed at the time.

Wire fencing was not introduced into the Canterbury agricultural landscape until about 1862. The situation was the same at Mount Peel, with timber having to be logged and carted to where it was required for fencing.

The other type of enclosure used in the early development of the station was a ditch and bank type of system, with the bank being planted with gorse, broom or some other equivalent. There are still remains of this 'wall' along the upper parts of the station today.

Before fencing could be established over substantial areas, the need for fencing around the homestead and stock yards had to be satisfied. The advent of post and wire fencing meant that more fencing could be achieved in less time and so land development could increase in accordance with the patterns of land subdivision discussed earlier.

Over time fences have reduced in their visual dominance in the landscape. The timber fence was a dominant type of construction, being about 1.25m in height and constructed of heavy posts and deep rails.

The ditch and bank type of fencing would also have been highly intrusive, though not necessarily discordant within the landscape. Its most dominant feature would have been

the exotic vegetation planted on it, as it would be in marked contrast with the natural tussock vegetation of the hill country. One thing to be remembered is that this type of enclosure was away from the usual views of the station and therefore it was not visually significant for the most part.

It was not long after the station was properly established that wire fencing was introduced. This form of enclosure is almost visually transparent, the only part which is visually intrusive being the posts because they form lines or patterns in the landscape. These lines are also emphasised when they separate different land uses, such as, crops from pasture, or, exotic pasture from semi-natural grassland.

The present practice of bulldozing fence lines again emphasises the fencelines, dissecting the hill country and creating discordant elements in the organic landscape. It is, however, a necessary practice which prevents the stock from getting under any large gaps between the bottom wire and irregular ground levels.

Many of the bulldozed fencelines are visible from the road, occurring on the higher terraces and downlands. These areas also contain the greatest amount of fencing and so the effect on the landscape is magnified by visibility, due to elevation, and by the frequency of fence lines.

(C) Field Shape

Fence lines also determine field shape which may also result in visually disturbing

elements in the natural, rolling landscape. This is especially significant where neighbouring fields contain different land uses, field shape thereby being emphasised by different colours. Again, because of the suitability of the soils and topography, the majority of the conflict is found in the downlands, terraces and lowlands.

On Mount Peel Station many of the fields have outer edges which relate to gullies and ridges. As a result the shapes of the fields may be more organic and therefore less dominant in the landscape. We can compare this to the field shapes found on the Canterbury Plains which have not resulted from natural, topographic limitations but from the limitations of climate; as a result they are predominantly square.

Field size and shape are illustrated on map 6, which shows the central area of the station.

Livestock

Livestock are extremely important to Mount Peel Station as they are the main-stay of the farm as a high country run.

In his notebook, dated 1854,¹² J.B.A. Acland mentions that stock in New Zealand were of varying prices, and he also comments on the trends he had observed in sheep and cattle farming in Canterbury. He records that cattle were being run on swampy land and that sheep were doing best on the dry country, especially the low hills and downs. These observations show that he was already looking carefully at agriculture in Canterbury; they were also proved to be very relevant with regard to the establishment of the Mount Peel run.

Sheep have always been the main type of livestock carried on Mount Peel Station. When it was first established by Tripp and Acland in 1857, they ran 1100 merino sheep. In 1858 the numbers had increased to 2700, and by 1859 to 3363 sheep. It took time to build up stock numbers, and it was not until after the winter of 1867 that Acland began to put sheep on the back of the Mount Peel run.

Early management of sheep in Canterbury was to put them on the runs and then try to keep them there; the lack of fencing having already been mentioned. Sheep were mustered once a year for shearing. 'Dipping' only began when 'scab' was spreading through Canterbury, after the importation of infected sheep from the Nelson area.

¹² J.B.A. Acland's Notebook, dated 1854: Acland Papers, Canterbury University Library.

Sheep were able to run over wide expanses of land, being watched over by a shepherd who herded them down to the riverbed whenever there was a possibility of fire. Sometimes the sheep were penned, or yarded, by night, especially when there was a risk of them catching the dreaded disease 'scab'.

As the flocks increased in size they would be split, each new mob being placed under the charge of a shepherd on another part of the station. Mount Peel Station, following a similar development process, was not fully stocked for years.

In 1912, about 20,835 hectares of Mount Peel Station were resumed by the government for closed settlement. As a result, 25,830 sheep were sold in order to maintain stocking levels appropriate to the amount of land available.

Other livestock on the station, in the early years, were bullocks, horses and mules; used primarily for transport and as beasts of burden. These animals indirectly affected the early landscape at Mount Peel because of their requirements. They were able to move along small rough tracks which were determined by the physical nature of the land; the visible effect being tracks which sympathised with the natural landscape. They also required additional feed and so oats were grown on the terraces near the homestead. These fields would have contrasted with the natural tussock landscape, and the oat stacks would have introduced new forms.

Today bullocks and mules, and to a large

extent horses, have disappeared from the station; only 'productive' livestock remains. The stock numbers for 1982 are:

cattle	835
sheep	10,200
deer	370

The cattle and sheep are grazed over most of Mount Peel Station, while the deer are contained by tall fencing on the flat.

The way in which the livestock are used on the station is in response to the landscape patterns and the tolerances of the different livestock types, as well as some management aspects. The livestock's use of the land is, therefore, a product of landscape patterns.

Sheep and cattle are able to utilise the grazing available on the upland parts of the station, without any intensive management or supervision. Although the deer could also do well in these areas they are confined to the terrace areas because of the more intensive management they require as domestic livestock.

The fencing required to confine deer is taller and more expensive to construct; costs for equivalent fencing on the upper hillslopes would increase markedly, as well as being more difficult to construct. Concentrating the deer on the more productive soils also means that they are able to be more intensively grazed, allowing a reduction in paddock area per deer, as well as an accompanied reduction in the amount of fencing. The extra management expenses

for deer, in terms of time, effort and the allocation of the better land resources, is justified by the higher returns gained from this type of livestock.

The intensity to which livestock can utilise the land on the station relates to the different landscape patterns already discussed. The uplands have shallower, poorer soils, with a reduced carrying capacity. The downlands, terracelands and bottomlands are more productive and have subsequently been subdivided, and the pastures improved, to make the management of these areas for livestock more efficient. In this respect livestock also help to determine landscape patterns, as the different patterns are defined by fencelines and land use management policies. Increased subdivision of the lower areas results in a different landscape pattern to that found in the extensively grazed uplands.

In general, however, the development and maintenance of better pastures, since the station was established, has increased the overall productivity and carrying capacity of all of the areas on Mount Peel Station.

The account books for Mount Peel Station¹³ indicate that the major crops grown in the early years were potatoes and oats. Potatoes were, presumably, a staple food for the workers on the station, while the oats were for the horses. According to the present Mr John Acland, oats were no longer grown by the 1920's as horses no longer made a major contribution to the farm work.

Crops were part of the early land development at Mount Peel. Land was initially ploughed and sown in potatoes, followed by about three successive wheat crops, before being finally sown in clover and English grasses.

Crops are also used in the development of 'native' land today, turnips often being used as a first stage crop before the pasture grasses are sown.

Those crops grown today are supplementary winter feed crops, for the stock on the station. Turnips and kale are the main ones.

There is no set rotation pattern for the land on which the crops are grown, and a paddock may be ploughed only once in thirty years.

The areas of land used to grow the station's crops relate closely to the topography and soil patterns. Topography poses physical limitations to the type of land that can be worked, machinery can only be used on land under about a 22 percent gradient. Soils which have a higher nutrient status and better water retention will obviously grow

better crops and so we find the soil types most cultivated are: Kakahu soils, Horotane soils and Mayfield soils. These soils, occupying land with a gradient suitable for cultivation, are found mainly on the easy rolling downlands and the river flats and terraces near the homestead area.

In the earlier years those soils which were on relatively flat land, and which had fewer stones, were used. Looking at the basic pattern of land development, there appears to be a correlation with soil type, the earlier crops being grown on Kakahu soils.

Recent technological advances have produced machinery capable of developing the more difficult soils, such as, the Waimakariri shallow soils.

The resultant visual effect of crops in the Mount Peel landscape is due to the contrasts in colour. Bright green crops, such as turnips and kale, are visually significant in the relatively natural landscape of the Mount Peel region. This contrast is generally emphasised by field shape, straight lines forming the line of demarcation between two land uses.

As the pattern of development tends to be irregular the visual result on the landscape is an irregular patchwork effect. This is especially noticeable where the development is occurring in an elevated position, on a north facing hillslope.

¹³Account books for Mount Peel Station contained in the Acland Papers, manuscript collection, Canterbury University Library.

PHOTOGRAPH 2: The visual effect of cropping in the grassland landscape at Mount Peel Station. This area is located at the bottom of the downlands. An important feature is the shape of the field, the dividing gully providing a comparison between natural lines in the landscape and straight fencelines.



PHOTOGRAPH 3: The visual effect of forestry in the Mount Peel landscape. The straight lines of this block of forestry (Mothering Paddock, refer to MAP 7) are emphasised by the contrasts in colour. Its elevated position in the landscape increases the visual impact. Also note the way in which the access road dissects the hillslope.

Forestry

Forestry is an alternative, long term farm crop which is used to get a higher return from poor quality, difficult to manage, land. There are a number of woodlots planted at Mount Peel Station, the earliest having been planted in the early 1950's and covering 0.5 hectares.

Mount Peel Station and the Waikari Hills run combined, have 14 forestry woodlots, most of them situated near the Rangitata Gorge Road (Refer to map). The total area covered by the woodlots is 79 hectares; the trees varying in age from newly planted to almost mature. Pinus radiata is the predominant tree species with only two lots consisting of Pseudotsuga menziesii.

Mount Peel Station, as defined by the proposed new boundary shown on map , has 37.1 hectares of forestry, all Pinus radiata, and only one block which is nearly mature. The woodlots are situated on hill slopes and terraces, mostly occupying the poorer agricultural soils within these areas.

The growth rate of the trees is average to above average for South Canterbury, probably due to the soils being relatively fertile and there being a reasonable rainfall over the summer months. Trees on the hill country tend to grow faster than those on the terraces, except where they are on the drier slopes exposed to the northwesterly winds.

Land preparation before the planting of the existing forestry blocks depends on:

- 1) the existing vegetation cover

- 2) the slope of the land
- 3) the soil type

Where 'brown top' was the existing vegetation cover, the trees were planted without preparation, but gorse covered land was sprayed and burned before planting. Terrace land was ripped before planting in most cases.

Forestry has been used on those areas of the station which would be difficult to develop for pasture management. Though it is often planted in gorse covered areas, it is not seen as a control for gorse. In the easier gullies gorse will be cleared and Pinus radiata established, but this only occurs where there is no apparent regeneration of natural bush.

At present there is little diversity in the tree species used, but there are future plantings of Douglas Fir (Pseudotsuga menziesii) planned. Though it takes longer to mature it usually yields timber of higher value.

The shape of plantings and their integration into the Mount Peel landscape is very important. Plantings at present tend to follow fencelines and as a result have straight edges which are not integrated into the landscape.

Mr John Acland, at present running Mount Peel Station, sees farm forestry in the next 20 years, playing an important role in developing land cleared of gorse and broom.

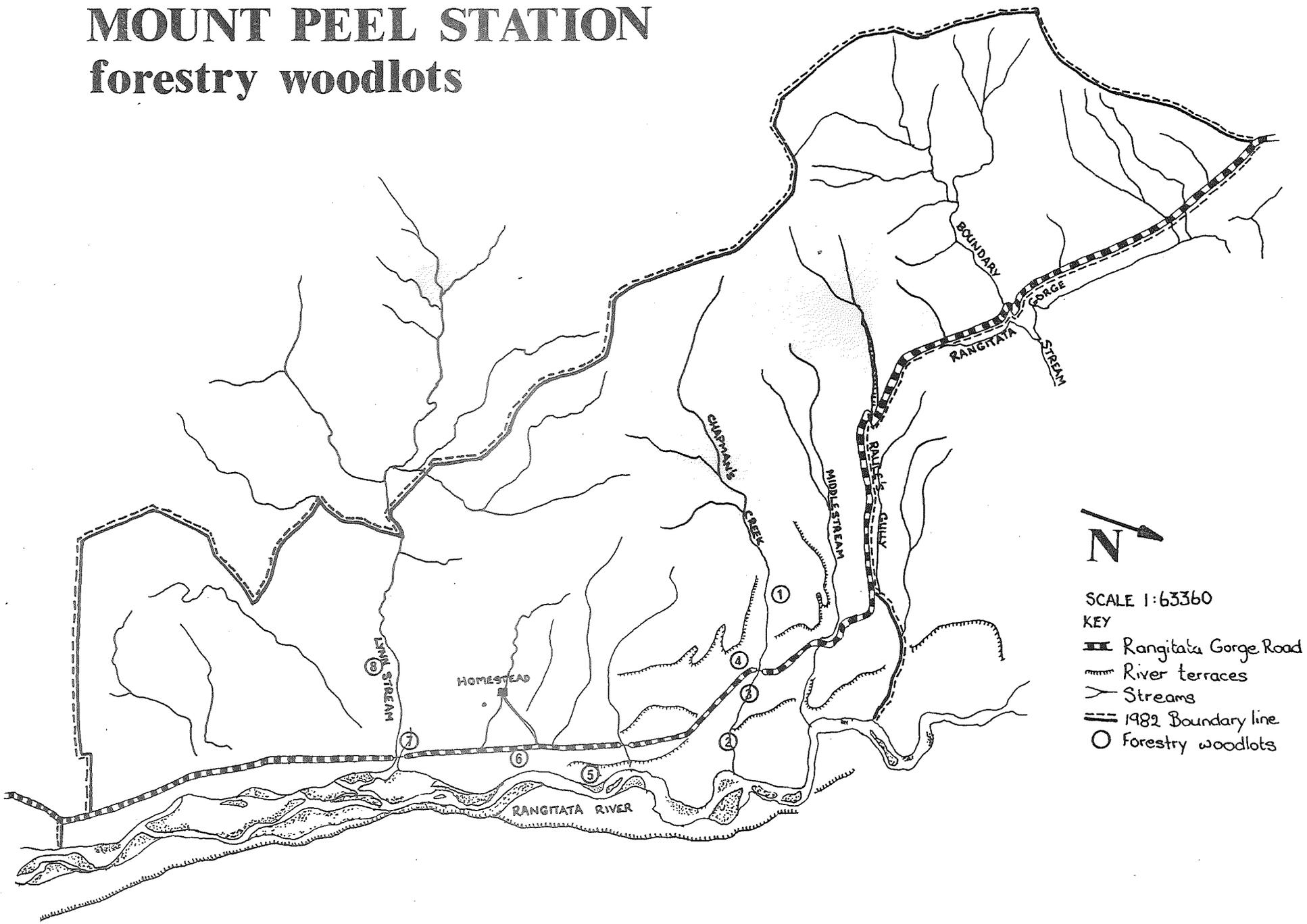
TABLE 1:
SUMMARY OF FORESTRY WOODLOTS AT MOUNT PEEL STATION

Woodlot	Species	Age (yrs)	Area (ha)
	<u>P. radiata</u>		
- Chapmans		16	6.3
- Trivetts		13	2.4
- Lower Chapmans		12	8.2
- Dixons		28	0.5
- Snake Gulley		1	8.6
- Woolshed		3-4	1.4
- Lynn		10	5.5
- Mothering Paddock		11	4.2
Total:			37.1

KEY TO THE LOCATION OF THE FORESTRY WOODLOTS ON MOUNT PEEL STATION:

1. Chapman's block
2. Trivett's block
3. Lower Chapman's block
4. Dixon's block
5. Snake Gulley
6. Wood Shed
7. Lynns block
8. Mothering Paddock

7 MOUNT PEEL STATION forestry woodlots





PHOTOGRAPH 4: A linear planting of young Eucalyptus sp. and Thuja sp. shelter trees. This planting is along a fenceline on the lower terrace lands.

Shelter

Shelter is seen as important for stock and pasture growth but, until the last 20 years, there has been little shelter planting carried out on the station. The reason for this remains unexplained but it is surprising that this should be the case when the effect of the northwesterly wind, on the north facing slopes, is considered.

In the early years, shelter was seen as being more important around the homestead and so there are many fine trees in this area of the station. The rest of the farm must have relied on the sheltered spaces to the lee side of the hills and spurs, and pockets of natural bush. There are several different tree genera now used to shelter various parts of Mount Peel Station. These may be divided into two groups as follows:

- 1) Eucalyptus spp. and Populus nigra 'Italica' (Lombardy poplar).
- 2) Coniferous tree species.

1. Eucalyptus spp. and Populus nigra 'Italica'

Eucalyptus is the main genus used on the flat river terraces, where they will grow quickly and tolerate the dry, windy, exposed conditions.

Lombardy poplar is not used on the station very often, though they are seen to grow well in the Peel Forest area.

2. Coniferous tree species

There are four predominant genera used for shelter on the station. These are: Chamaecyparis lawsoniana, Pinus radiata and Pinus ponderosa, Pseudotsuga menziesii,

and Thuja spp.

Chamaecyparis lawsoniana is difficult to establish and not very tolerant of the dry, exposed conditions.

Thuja, though a little more tolerant, it is also difficult to establish and only grows slowly.

The most successful of the coniferous tree species are the pines, Pinus radiata and P. ponderosa. These will grow almost anywhere on the station, P. ponderosa seemingly harder and growing well in the dryer areas.

Pseudotsuga menziesii (Douglas Fir) does well in the more fertile areas, and may also be a valuable source of timber in the future, especially if planted in deep enough blocks.

The placement of shelter in the Mount Peel landscape presently follows the fence lines, and is concentrated in those areas near the homestead and river terraces.

Access Routes

In the very early years travel around Canterbury was by landmark, compass and intuition. This must have been Acland's and Tripp's method of navigation around Mount Peel, as well as Canterbury. Eventually tracks were worn, according to the direction of travel and the natural landform; they probably skirted around bogs and dense scrub thickets, travelling by the easiest route and in the general direction of a prominent landmark.

When they finally reached the Rangitata River, they had to find a way down the steep northern bank and then ford the unpredictable river. The day they arrived with the bullocks and stores, to settle Mount Peel Station, they had to ferry the stores across on the drays.

One of the first tracks cut at the station was one down the northern face of the river bank; so that easier access to the fording place could be gained. This was known as the 'Longford crossing', and was situated almost opposite the site of the homestead. It was apparently quite steep, but it did allow the dray to be dragged up and down the bank face from the end of the punt which had been built in 1858.

In 1857, Robert Smith and Abner Clough cut a track through the bush to enable them to walk to Peel Forest. Acland and Tripp were, however, in no hurry to open a proper road through the forest, their very isolation being protection against the sheep disease 'scab'. The first road through Peel Forest was constructed in

1863, it was a dray road and had been cut through the bush by men working from both ends.

In 1860 a ferry had been constructed, near the present site of the Rangitata River Bridge, and this plus the new road through Peel Forest, brought Mount Peel closer to civilisation.

On Mount Peel Station supplies were carried to the out station by mule trains, until more modern means of transport were available, or some of the most inaccessible regions were abandoned. Today, efficiency of travel has been achieved by motorised transport, but these require larger tracks to be cut to allow access to different parts of the station.

Some of these access roads dissect the landscape, zig-zagging across the hillslopes, as dictated by the gradient. Convenience, rather than aesthetics, has been the dominating factor, and so, many of them detract from the natural beauty of the Mount Peel landscape.

Technology

The developments in agricultural technology this century has meant that the managers of Mount Peel Station have been able to develop larger area of native land, in shorter periods of time. The rate of development has increased in all areas of the station; with the development of machinery capable of cultivating the more difficult soils.

The improvements in machinery and the application of fertiliser has meant that the production capacity of the improved pastures has been able to be maintained. At present Mount Peel Station receives an annual application of superphosphate and an application of lime every four years.

Those pastures at higher altitudes have also also been developed, due largely to the advent of aerial topdressing. The use of aerial topdressing has increased in recent years and the upper pastures have been oversown and fertilised to improve production. Today, however, the rising costs of fertiliser and especially of fuel, has meant that the feasibility of such methods of improving land and maintaining production will have to be seriously considered in the future. The use of aerial topdressing on the terrace lands will, however, be continued due to their higher production capacity.

Mr J Acland, presently managing Mount Peel Station, sees natural methods of improving pasture production as being important in the future. These natural methods primarily involve the use of plants which are able to fix their own nitrogen from the air and which also have a low phosphate requirement.

Some such plants are Trifolium spp. and Lotus spp. One of the Lotus sp. shows special promise for application at Mount Peel Station, according to Mr Acland.

Buildings

It is not intended that the important historical buildings be discussed in this section, as they will be covered in detail in Part III. However, the importance of the siting and the colour of the buildings on Mount Peel Station will be discussed.

As in most farming situations the buildings generally act as focal points, signalling the main working areas. Mount Peel has a homestead area which includes many of the farm buildings and worker's houses; the clustering of the buildings giving a more satisfactory visual appearance, than would an unrelated scattering of structures.

The colouring of the buildings at Mount Peel is usually harmonious with the colours of the natural landscape. Brick has been a commonly used building material, its red/brown colouring supplying a pleasant contrast to the tawny browns and greens of the countryside. Wooden buildings have been stained, or painted, a red/brown also, with the same visual effect.

There is also a unity of colouring between buildings, and this is especially important where several can be seen in any one view. Siting of the buildings has usually occurred so that the structures sit well in the landscape. The homestead was sited in response to the climate and the needs of the household. The other buildings have been spaced out on the flat terraces, within the general homestead area.

The church has been placed on a knoll overlooking the river terraces and homestead area, its elevated position in the

landscape acting as a symbol of the people's faith.

Overall, the buildings at Mount Peel Station have been well integrated into the natural landscape. They have been sited logically in response to the natural elements combined with the needs of the people. The colouring of the buildings also provides a pleasant contrast to the natural colouring of the surrounding landscape.



PHOTOGRAPH 7: A worker's cottage and out-buildings nestled beneath a planting of mature oaks.



PHOTOGRAPH 8: A remnant of natural bush which has been retained in one of the gullies of the middle river terraces. Such gullies help to create a visually integrated landscape with a distinctive character. It is also a functional aspect of the agricultural landscape at Mount Peel as the gullies, if developed, would be difficult to manage successfully.

Weeds and Pests

(A) WEEDS

Many of the plants which have become a weed problem at Mount Peel Station were introduced by the unknowing settlers of the land. The main ones plaguing Mount Peel at present are:- Ulex europeus (gorse), Berberis glaucocarpa (barberry), Rubus fruticosus (blackberry), Cytisus scoparius (broom). In addition to these main ones there are also, nodding thistle, californian thistle, barley grass, himalayan honeysuckle, whistlewood and tutu.

Gorse

There was said to be no gorse in the Rangitata riverbed prior to 1873, about which time it was planted freely in hedges. By October 1886, it was obviously becoming a problem at Mount Peel Station, as the first reference to gorse grubbing appears in the account books.¹³ Today it occupies large areas of the riverbed, and some hillsides.

Gorse is able to establish itself in the silt patches in the riverbed, and when floods occur the bushes trap more silt until small mat communities are able to develop. The plant's vigor, and its ability to seed profusely over a long season, means that dense communities rapidly establish, smothering other plant communities.

Riverbed gorse is able to be burnt back to expose the silt, and with careful stock management, turf may be developed.

On the hillsides gorse is a very striking feature. It was originally used in conjunction with the ditch and bank type fence, and this became the seed source for the gorse thickets which are present today.



PHOTOGRAPH 5: A gorse community (Ulex europeus) establishing in the Lynn Stream riverbed.

In the past they tried to control this weed by grubbing and burning, but gorse is able to remain viable in the soil for many years; leading to repeated emergence once establishment has occurred in the paddocks. In 1933 the gorse weevil was liberated in the area and, although it slowed the seedling rate, it was not wholly successful due to the coldness of the Mount Peel winters.

¹³ Mount Peel Station's Account Books: Acland Papers, Canterbury University Library.

Today spraying is used to control the gorse in the paddocks. In the poorer areas, after the gorse has been cleared, forestry is planted thereby helping to control the gorse through plant competition.

Above about 550m, gorse becomes less aggressive, and the vigor and frequency of bushes is reduced. It is rarely found above 600m.

Gorse, if left, can form the basis for the successive regeneration of native plant species.

As gorse often colonises freshly disturbed soils or abandoned pastures, it soon establishes a dense cover which inhibits the establishment of more seedlings. This is the first successional stage.

With age this cover gradually opens, allowing increased light penetration so that other seedlings may begin the second successional stage. The sheltered microclimate within the gorse, and the fertile litter on the ground, provide a suitable environment for native seedlings to establish. The species which do establish will depend on the seed sources in the area.

The succession of plants will continue until the natural climax vegetation, possibly similar to the original vegetation cover, has evolved. This succession may be interrupted by fire, which encourages new gorse regeneration from seeds and sometimes existing stems.

It is interesting to note that, the regeneration of natural bush from gorse is faster

than natural succession from beneath manuka or kanuka scrub.

In 1933 the gorse weevil was liberated in the area but it was not wholly successful due to the coldness of the Mount Peel winters.

Barberry



PHOTOGRAPH 6: A barberry plant (Berberis glaucocarpa) which has become established in the Lynn Stream riverbed.

In 1859, on October 2nd, J.B.A. Acland recorded in his diary:

'Sowed barberry seed by paddock.'¹⁴

It was to be the beginning of a problem which had to be faced by the successive generations on Mount Peel Station. Today, in early winter, there are hillsides which 'glow' pink with this aggressive weed. It is also found in the creek and riverbeds. Many plants grow on steep or broken ground where they are difficult to control.

Like gorse, barberry has an excellent defense system in its long, sharp thorns which prevent it being attacked by stock. Again the means of control is to spray, and possibly burn, to clear and develop land which has been invaded by this weed.

Broom

A similar story can be told about the introduction of broom to Mount Peel Station. In February of 1860 J.B.A. Acland records that, he was in Christchurch picking the seeds of broom, etc.,¹⁵ which he planned to establish at the station.

Today broom is especially aggressive on the creek and riverbeds, as well as being found at relatively high altitudes. It is widespread throughout the station, growing quickly and seeding prolifically.

The above three weed species are often

found in mixed communities along the riverbed, especially gorse and broom.

Blackberry

Blackberry is another aggressive weed but does not appear to be as common as the others at Mount Peel Station. It appears to prefer slightly deeper, more fertile soils; nor is it to be found to the same extent in the riverbed areas. There are some small, dense communities to be found around the homestead area.

It is readily spread by birds but the seedlings grow slowly and are controlled by high grazing pressure; making it more likely to become established in areas, such as fencelines and thickets, where it is protected when young.

(B) PESTS

When Acland and Tripp arrived at Mount Peel Station the main pests were rats, wild dogs and wild pigs. The rats invaded the new house, spoiling the stores, and so a food store on poles was erected, similar to those built by the Maoris. Wild dogs were few in number and soon exterminated. Wild pigs, however, were very numerous and it took many years before their numbers were appreciably reduced.

Rabbits were of little significance before about 1886, when on account with the government for rabbit killing first appeared in the account book. In 1887 'rabbits' had a separate accounts section, and the cost of controlling them had increased.

¹⁴ J.B.A. Acland's Diary, 1859: Acland Papers, Canterbury University Library.

¹⁵ J.B.A. Acland's Notebook, dated 1860: Acland Papers, Canterbury University Library

Costs for pest control;hares, rabbits, pigs etc., from the station's accounts books:-¹⁶

1886 £ 9/16/9

1887 £12/6/6

1889/90 £43/7/-

After 1892 this amount began to reduce and we can only assume that this was because the pests were being controlled.

The pests on the station today do not appear to be very significant. Rabbits are not a problem because the high number of wet days appears to reduce their breeding rate. Mount Peel is lucky in this respect because Mesopotamia, further up the valley, has a serious rabbit problem. Hares are more prevalent than rabbits on the station and deer were, at one time, a problem.

¹⁶ Mount Peel Station's Account Books: Acland Papers, Canterbury University Library.

Runholders' Attitudes

When Acland and Tripp first settled Mount Peel Station they saw their land as one vast resource, to be manipulated and turned into a great and profitable sheep run. They were pioneers in the true sense, making the most of their raw resources.

Acland tended to be a realistic man of strong character and on his return trips to England he told of the opportunities offered by this new country in realistic terms:

"Men go out to the colonies for various reasons:-

First. A man may go out merely officially, holding some military or other government appointment.

Secondly. He may be travelling in search of health or pleasure, or for scientific purposes.

Thirdly. He may go out intending to make as much money as he can in a few years, and return to England.

Fourthly. He may be wishing to improve his condition by finding and making for himself a new home in a newland, and, as a true colonist, be prepared to cast his lot in with the fortunes of his new country, be that what they may.

It is to those who have this last objective in view that New Zealand offers special advantages, and it is with this object that the class of persons to whom I have alluded shall go out. Let them not form the visionary ideas of making fortunes;

they will not do that, but they may, one and all, make a solid improvement in their condition, acquire a moderate competence, and leave their children settled on their own freehold land, in a fair way of doing well."¹⁷

This short extract from his lecture in England clearly shows J.B.A. Acland's attitude to Mount Peel Station and what it meant to him; it was intended to provide him with a means of earning a living, as well as, providing a place, a home, for his children.

It was not only his children that he intended to settle, J.B.A. Acland also had ideas of creating a small station settlement on which to settle the farm workers. This seems to be reminiscent of the small, self-contained villages he would have known in England.

The influence of England to these early settlers was great. They must certainly have missed the gentle English countryside while trying to establish themselves in a barren and somewhat inhospitable, and foreign, environment. It was to be expected that they would try to recreate some of the old landscape they knew in the Mount Peel landscape. In his journal of September 28, 1856, J.B.A. Acland is quoted as saying:

¹⁷J.B.A. Acland's Lecture, 1858: Acland Papers, Canterbury University Library.

'I hope, if I live, to do my share to reproduce England in this southern hemisphere.'¹⁸

At the time he was bringing fir cones from Christchurch to Mount Peel Station in order to begin his transformation of the landscape.

Together Acland and Tripp did begin to transform the natural Mount Peel landscape. The burning they did has already been discussed but it must be remembered that, although we would consider it detrimental to the environment today, it was an act done in ignorance of the natural conditions prevailing in this new land. They were again trying to develop the land according to the type of agriculture they had known in England, as well as the little experience they had gained while working as cadets in Canterbury.

The forest around the homestead area was seen as a valuable resource for timber and not as one of the few remaining large areas of natural forest on the Canterbury Plains. From the time settlement began it was exploited to satisfy the Station's building requirements; as well as by other nearby settlements and stations. It was to take many years before the value of the native environment, as other than a timber or agricultural resource, was to be realised.

Attitudes have changed however, and the areas of natural bush and forest which remain are protected by the present station manager, Mr John Acland. Areas which show

signs of regenerating natural bush are fenced off and encouraged to re-establish, especially in gully areas and the steeper hillslopes which are difficult to manage for agricultural purposes. They could however have exotic forestry potential and the fact that they are being retained for their value as natural bush illustrates the present concern for the Mout Peel landscape.

Mr John Acland, and his family, have an attitude of conservation to the many different values possessed by Mount Peel Station. These include; its historical values, its ecological and natural values, its economic value and its landscape value. While the station is important as an economic, high country run, an effort has been made to preserve its natural and historical heritage. In addition to the protection of natural forest and bush, the homestead has also been placed under the control of a trust board, in order to protect it from any alterations which would reduce its significance as an historical building. It will act as a monument to J.B.A. Acland and his family, the first settlers of the Canterbury high country, for many years to come.

At the same time an effort is also being made to return the homestead to something like its original condition. As a result, the building has been painted in its original colours, and the present Aclands plan on restoring the small brick cottage at the rear of the 'big' house, and which presently acts as the farm office.

Although some aspects of the station do detract from its total potential as an

¹⁸J.B.A. Acland's Diary, 1856: Acland Papers, Canterbury University Library.

aesthetic agricultural landscape, the attitude of the Aclands' is to improve the appearance of their property in conjunction with any agricultural development. This also involves retaining some of the inherent natural characteristics of this landscape.

Other aspects, such as the planting of different tree species for shelter on different areas of the farm, and the co-ordination of buildings using colour and placement in the landscape, do help in creating a functional farm environment in a visually integrated landscape.

Since the station was first established the attitudes of the successive owners, and managers, have changed with an increase in their knowledge of the land. Although they have always been concerned with the landscape, the emphasis has changed from re-creating part of a familiar environment in a new land to preserving the natural attributes of the Mount Peel landscape for its own sake. Development however is still able to continue by co-ordinating the requirements of agriculture within the physical framework of the existing landscape.

PART II (c)

Summary

From the various sections discussed it can be seen that, Mount Peel Station may be divided into three main areas, based upon topography. These are:-

- (A) uplands
- (B) downlands
- (C) lowlands and terrace lands

The other patterns of soil type, vegetation cover, and to a degree that of land development, can also be seen to correlate with these three areas.

The information discussed in the various sections of part I and part II of this dissertation, has been summarised in table. From this summary table the various patterns in the Mount Peel landscape can be seen; illustrating that landscape patterns are a product of the physical properties of the land.

It has not been my intention to discuss the possibilities for future landscape developments at Mount Peel Station, but, to give an account of the way in which the patterns and features, present today, have developed.

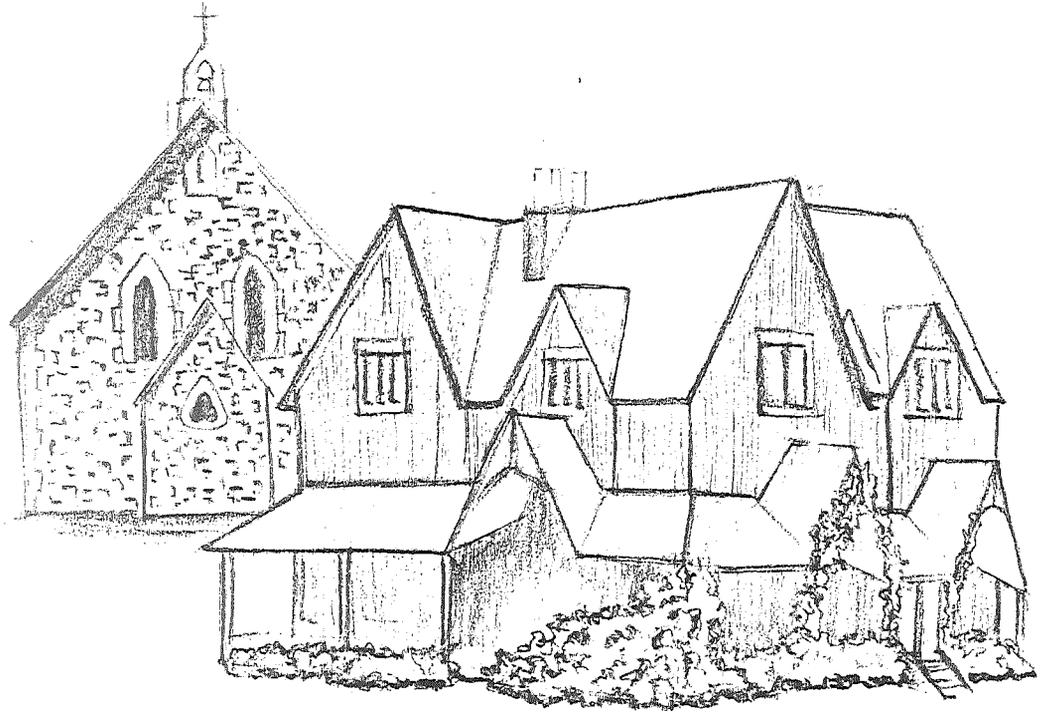
All of the various aspects, which have been discussed, have contributed to the agricultural landscape at Mount Peel Station. In some cases their contribution may not be positive, or enhancing, but they do illustrate that there is a need for concern where the development of the land resource is occurring.

Figure 4: A summary table of the sections discussed, relating each to the 3 main topographic areas

PART I (B)	UPLANDS	DOWNLANDS	LOWLANDS and TERRACE LANDS
<u>TOPOGRAPHY</u>	<p>Moderately steep to steep with some rocky bluffs and outcrops. Some narrow rolling ridge crests and 'razorback' ridges.</p> <p>Altitudinal range is above 760m</p>	<p>Rolling hills to moderately steep topography, containing some steep gullies.</p> <p>Altitudinal range is 460-760m</p>	<p>Flat plains and terraces to gently undulating land.</p> <p>Altitudinal range is less than 460m</p>
<u>SOILS</u>	<p>Yellow brown earths: Kaikoura steepland soils Kaikoura hill soils Kaikoura soils Hurunui steepland soils Hurunui hill soils Hurunui soils</p>	<p>Yellow grey earths to yellow brown earths intergrade: Kakahu hill soils Kakahu soils</p>	<p>Recent soils: Mayfield soils Waimakariri shallow soils Hororata soils</p>
<p><u>NATURAL VEGETATION</u></p> <p><u>MODIFIED VEGETATION</u></p>	<p>Mostly a mixture of silver/fescue tussock grassland, with some snow tussock, especially on cold faces. There is some sub-alpine scrub at higher levels. In the gullies there is some broadleaf/podocarp forest with flax and hard fern in the damp areas.</p> <p>A small remnant of beech forest is also present.</p> <p>The vegetation in this area is the least modified since the European settled the area. Broom is a problem in some areas and gorse is present but lacks its usual aggressiveness.</p>	<p>Mostly fescue tussock grassland with some snow and red tussock. Patches of manuka scrub are present and there is some broadleaved forest in the gullies.</p> <p>The natural tussock grasslands have been modified with the introduction of exotic grass species. Some tussock patches remain but these are thin and interspersed. Native vegetation has been largely removed though there is a protective attitude towards the remnants. Gorse is a problem.</p>	<p>Mostly silver/fescue tussock grassland with patches of matagouri scrub.</p> <p>Little remains of the natural vegetation in these areas. Exotic grasses have replaced the tussock grasslands and exotic trees and weed species have become naturalised. Some natural bush remnants in the gullies. There are also pockets of matagouri and cabbage trees on the terrace faces.</p>

Figure 4: A summary table of the sections discussed, relating each to the 3 main topographic areas

PART II (B)	UPLANDS	DOWNLANDS	LOWLANDS and TERRACE LANDS
<u>DEVELOPMENT</u>	<p>Began in 1855/56 when Acland and Tripp first began firing the land and sowing exotic grass species.</p> <p>Not suited to more intensive development due to the harshness of the climate, the poor quality soils, the importance of maintaining the natural vegetation cover and accessibility.</p>	<p>Began 1855/56 with Acland and Tripp. Besides developing agricultural pastures they also cultivated the soils in this area because they were less stony</p> <p>Further development of this area has occurred with more intensive pasture production as a result of subdivision, oversowing and topdressing.</p>	<p>Began 1855/56 and was used mainly for pasture, though some oats were grown on the terraces near the homestead.</p> <p>Better methods of developing the stony land have recently resulted in improved pastures which are more intensively used.</p>
<u>FIELD SIZE</u>	Large extensive areas with few fencelines.	Smaller fields and an increased number of fencelines e.g. one paddock divided into nine smaller ones since 1960	Smaller fields, and increased number of fencelines e.g. one paddock has been divided into twenty smaller ones since 1960.
<u>LIVESTOCK</u>	Sheep and cattle	Sheep and cattle	Sheep, cattle and deer
<u>CROPS</u>	Nil	Supplementary winter feed crops.	Supplementary winter feed crops.
<u>FORESTRY</u> - presence - potential	<p>Nil</p> <p>Only for remaining native forest for soil protection purposes.</p>	<p>Present</p> <p>Good potential for production forestry, especially <u>Pseudotsuga menziesii</u> (Douglas Fir), where access is available for maintenance and logging.</p>	<p>Present</p> <p>Good potential for production forestry; <u>Pinus radiata</u> (Radiata pine) in gorse covered areas such as those terraces near the riverbed, and in gullies.</p>
<u>SHELTER BELTS</u>	Nil	Some	Present, especially on the lower terraces, near the homestead.



PART III

Mount Peel Station Homestead and Gardens

Site Selection Criteria

Acland and Tripp had spent quite a lot of time travelling around the South Canterbury high country, during which time they had lived in a tent. With this experience they would have gained a feeling for the land and the climate, this would have helped them in their careful choice of a homestead site.

The northwesterly wind was the main factor in selecting a site for the station's new homestead. Mount Peel is in a natural corridor along the Rangitata riverbed and so shelter is of prime importance. The site chosen was partly sheltered from the wind by the hills. Today it is also sheltered by the many trees.

There were, however, other important considerations. Tancred had given J.B.A. Acland three important tips about choosing a site for a homestead:-

- (1) handiness to water
- (2) handiness to firewood
- (3) to be sure to make the garden where cabbage trees grow thickly, as they only grow closely on good land.¹⁹

Mount Peel homestead was blessed with all of these qualities. The water came from the nearby creek, and there would never have been any shortage of water with the Rangitata River nearby. Wood was plentiful in the natural bush and scrub covering the area. Cabbage trees were common around the garden, and can be clearly seen in the homestead photos in the next section.

Another important factor in choosing the homestead site was that it should be located in a relatively central position to the runs owned by Acland and Tripp, this made the travelling distance to all points as short as possible.

The homestead today stands well sheltered by trees at the base of the low hills. It has a pleasant view across the river terraces to the Rangitata River and its sculptured northern bank.

¹⁹ Acland, L.G.D: Early Canterbury Runs.

Mount Peel Station's Homesteads

When the party comprised of Acland and Tripp, Mr and Mrs Smith and their children, W Wyatt, Ned Sampson, Sharp and, Abner and Robinson Clough arrived at Mount Peel, they had to live in a tent. Within a week after their arrival a site had been cleared and the building of the first house at Mount Peel commenced.

The building was a simple cottage and was constructed from the cabbage tree trunks which were plentiful in the area. It was certainly more substantial protection from the approaching winter frosts. Tripp in a lecture he gave in Devon, in 1862, described it thus:-

'The first house which we built was run up in about 19 days, the walls formed of 'cabbage trees' about 9 feet high and slightly sunk in the ground with a rather high pitched roof to all of a part of a loft for stores over the living room; the size of the house was 18 feet by 10 feet divided into two rooms.'²⁰

A second house was commenced a short time later. This one was made of timber, rough hewn planks, from the nearby bush. Consisting of two rooms, it measured about 7 metres by 5.5 metres. A lean-to, built of slabs, was added to the back making it

'more substantial than the first in every way....'²¹

according to Tripp in his lecture.

²⁰C.G. Tripp's Lecture, 1862: Acland Papers, Canterbury University Library.

²¹Ibid

The roofing material for these first houses was dried toi-toi thatch, as can be seen in the photograph.

While Acland was away in England, between March 1857 and January 1859, Tripp added another building to Mount Peel Station. It was a small weatherboard house, with a verandah, divided into six rooms. Mr and Mrs Tripp lived in this new house, Acland lived in the old hut and whare on his return.²²

Acland was married to Emily Weddell, eldest daughter of Bishop Harper and sister to Mrs Tripp, in January 1860. When the partnership between Acland and Tripp dissolved in 1862, it was Mr and Mrs Acland who erected the present Mount Peel homestead.

Family tradition has it that the design for the 'big house' - 'Holnicote' - was imported from England. John Stacpoole, however, states that the design was executed in 1864 by Frederick Strouts who was working actively in Canterbury around this time.²³

The homestead was constructed, in 1865-66, of bricks which had been fired on the drive, about 275 metres east of the church, by Ben Ede and John Fitzgerald. All of the required timber was taken from the bush along the sides of the Lynn Stream. It was then pit sawn by Ryan, Bea, Thorn, Marshall and Wyatt. The roof slates came to New Zealand from Wales; family tradition states

²²Acland, Early Exploration at the Headwaters of the Rangitata River.

²³Stacpoole, Colonial Architecture in N.Z., p107

that they came as 'ballast in a sailing ship.'²⁴

Originally, Holnicote also possessed a small octagonal conservatory, the structure can be clearly seen in photograph . It no longer existst, having been blown down in the 1940's.

In 1897 Holnicote was pictured in a book by Wheeler, the photograph was entitled:-

'UP COUNTRY HOUSES:- Holnicote, Mount Peel, the residence of Hon J.B. Acland. This charming residence is on the Mount Peel estate, Rangitata, and is very picturesquely situated - some lovely views being in the vicinity - forming pleasant points for riders and picnics. The gardens around the house are beautifully kept, and remind one very pleasantly of a well ordered country residence in the Old Country.'²⁵

The homestead at Mount Peel became well known in the area; being one of the earliest 'grand' houses in the South Canterbury region. It has received many important visitors over the years. Lord Lyttleton, when travelling around Canterbury (in the late 1860's early 1870's?), recorded his impressions as follows:-

'Once arrived and the toils of the journey surmounted nothing could

much exceed the comfort and enjoyableness of the place, which was by far the best specimen of their country-house that we saw. Mr Acland, who had more command of capital than most of them, and who means to make it his home and plant a family there, has been able to build and decorate to an unusual degree of completeness'...

'The house is one of very few built of brick, made on the spot. It is of the large cottage style like an English or Scotch shooting box; and inside, but the dining room was yet unfurnished, like one of the pleasantest English country houses.'²⁶

Little has changed, and it still has a similar appearance today. It sits in the landscape backed by the hills and beyond these one can see the snow-cropped mountains. Many mature coniferous trees and oak trees, surround the site, marking its position in the Mount Peel landscape.

It remains the residence of the Acland family, having been handed down through the generations.

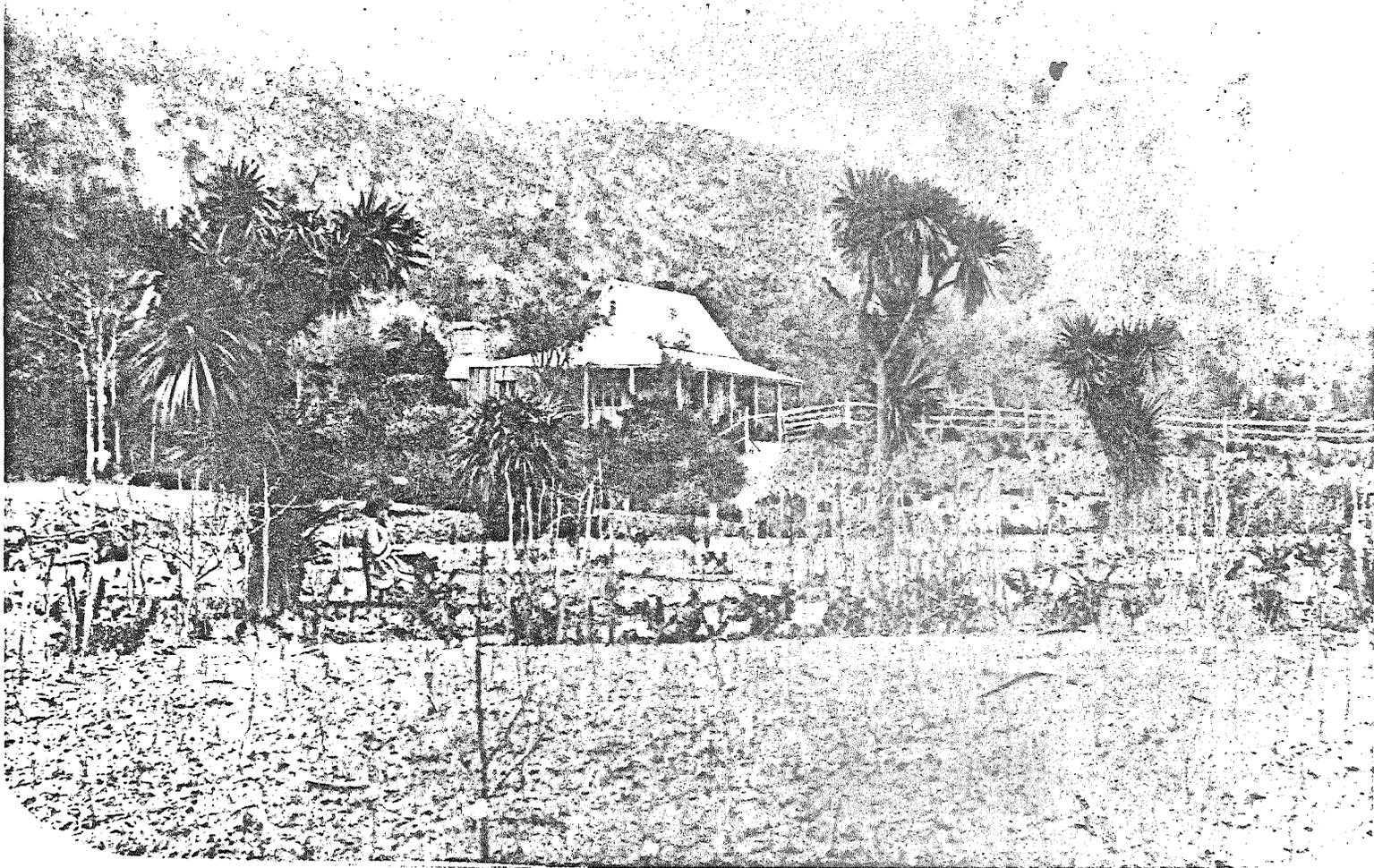
²⁴Typescript sheet courtesy of Mr and Mrs Acland, Mount Peel Station.

²⁵Photograph in Canterbury Museum Archives.

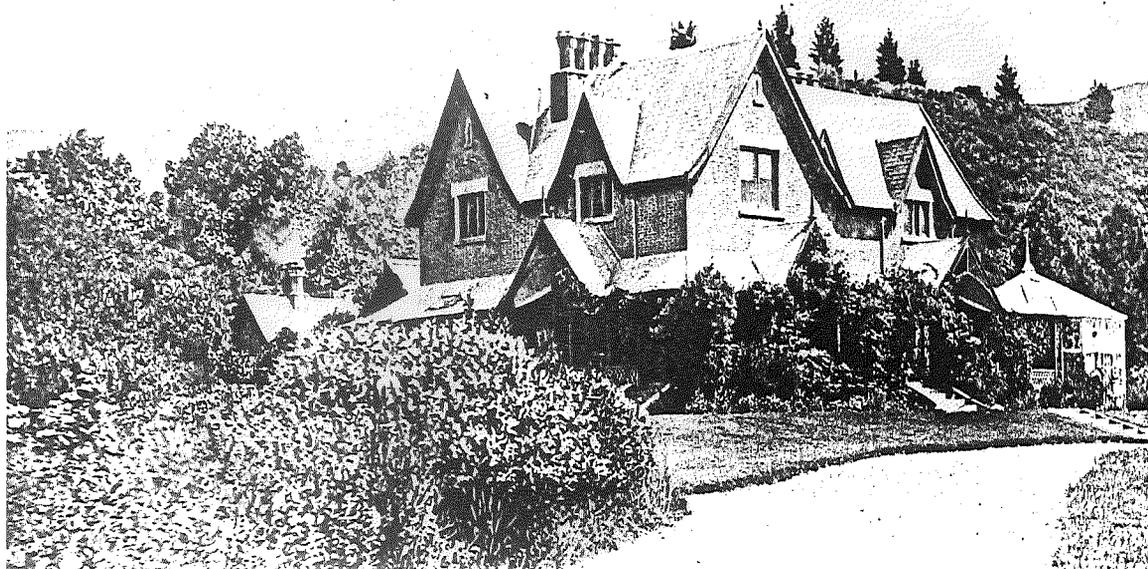
²⁶Philips et al., A History of Canterbury Volume II, p. 182



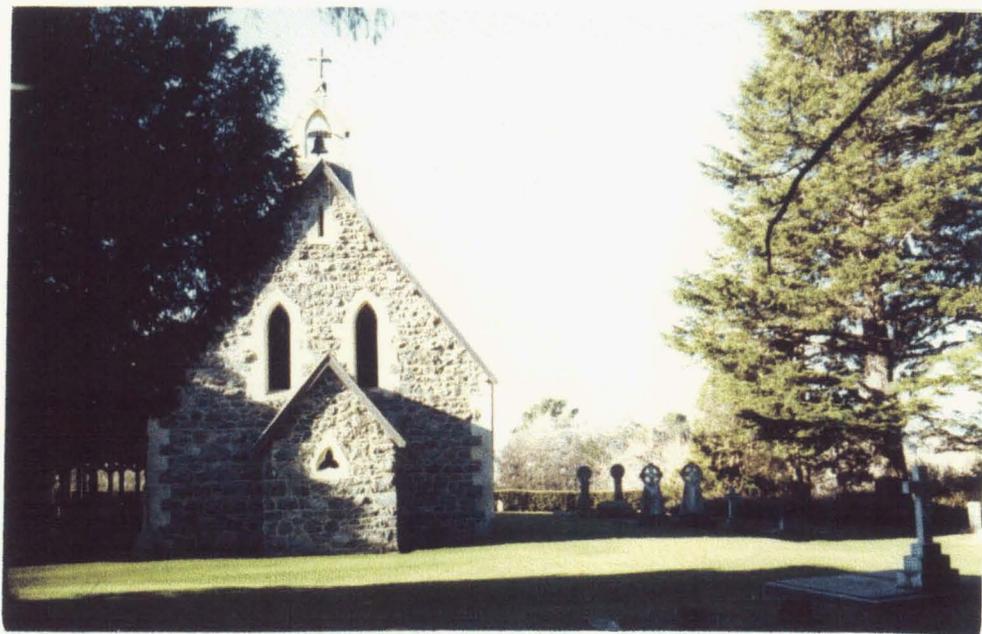
PHOTOGRAPH 9: (1860) The early houses at Mount Peel Station. Courtesy of Mr and Mrs Acland.



PHOTOGRAPH 10: (1857?) Tripp's weatherboard home.
From the Tripp collection, A.C. Barker photograph;
courtesy of the Canterbury Museum.



PHOTOGRAPH 11: (1898) Holnicote, Mount Peel Station.
Courtesy of Mr and Mrs Acland.



PHOTOGRAPH 12: The Church of the Holy Innocents at
Mount Peel Station.

The Church of the Holy Innocents

J.B.A. Acland had faithfully held Sunday worship where ever he happened to be. In his ideas for the development of Mount Peel Station he had included the building of a church for the family and people of the surrounding district. On the 13th March, 1866, he donated approximately 8 hectares of land to the Church Property Trustees so that his dream could be realised.

He erected the church high on a tussocky terrace, overlooking the surrounding river flats and homestead area. The foundation stone was laid by his wife, Emily Weddell Acland, on the 14th December, 1868.

The plans for the church were a gift from the Reverend P.L.D. Acland, Vicar of Broadclyst, Devon and Sub-dean of the Exeter Cathedral. They had been drawn by Mr Ashworth of Exeter, but Emily Weddell Acland changed his design for the church's bell turrets.

The church is built of faced boulders, from the Rangitata riverbed and river flats, and was constructed by William Brassington, well known for the building of the Canterbury Provincial Chambers in Christchurch. Some quarried stone and the burnt lime for the mortar, was brought by bullock dray from Mount Somers. The timber used inside the church was black pine and totara, with some white pine. Knotted totara was used for the altar and altar rails.

Bishop Harper, first bishop of Canterbury, consecrated the church on the 12th December, 1869. It was named the Church

of the Holy Innocents after the three infant children buried on the hillside: Emily Dyke Acland, Helen Irvine, and Abner Clough. In 1869 J.B.A. Acland also became the first lay reader of the church.

Inside the church there are a number of stained glass windows, which have been donated by various people since 1889. The following table shows the location of, and the information relating to the six windows.

J.B.A. Acland died in 1904 and is buried beside the church. Every New Year's Eve, since 1882, it has become the tradition for a member of the Acland family to toll the bell and ring in the new year.

The church grounds also contain many mature trees, a mix of exotic and native species.

TABLE 2: A SUMMARY OF THE STAINED GLASS WINDOWS INSTALLED IN THE CHURCH OF THE HOLY INNOCENTS, MOUNT PEEL STATION.

Date	Position	Donor	In Memory	Makers
1889	north east		Micheal Mitton manager of Mount Peel for 15 years	Cox and Buckley, London
1904	south east	Emily Weddell Acland	her daughter Lucy Alice Dyke Thomson	Cox and Buckley, London
1908	east	J.B.A. Acland's children	J.B.A. Acland & E.K. Acland	Powell of London
1917	north east	Frederick Villebors Lysaught	his wife: Emily Dyke Lysaught	Parsons of London
1929	south west	Hugh Thomas Dyke and Evelyn Mary Acland	their two sons: Geoffrey & Mary	Parsons of London
1943	south	N.Z. Sheep- owner's Federation	H.D. Acland	R.H. Fraser of Dunedin

The Homestead Garden

Both J.B.A. Acland and his partner, C.G. Tripp, were very keen tree planters. The barren Canterbury Plains, which the homestead overlooked, must have been powerful stimulus to the two men to plant trees on their own land. They began as early as 1859, many seeds and trees being brought from England, Australia, and a few from America. Many were also reared in the station's gardens and planted out during the 1860's.

The first trees, imported from Exeter, England, were planted in 1859. They had been transported to New Zealand in wardian cases, and included a Douglas Fir (Pseudotsuga menziesii) and a Himalayan Cedar (Cedrus deodora).

From Sydney came a Radiata Pine (Pinus radiata) which was also planted in the Mount Peel gardens in 1859.

Many trees were gradually added to the gardens, most coming from a few main sources; James Veitch's nursery in Exeter, Shepherd's nursery in Sydney, Abbott's nursery in Christchurch and some from Mr French, a nurseryman in Timaru. Mount Peel itself, also had a gardener and a nursery for raising tree seedlings; this was established around 1859, possibly earlier.

The following lists show the majority of the seeds and trees imported to Mount Peel from three main sources.^{27/28}

- 1) Imported from Veitch's Nursery, Exeter 1861 - List of plants for J.B. Acland Esq (in a letter dated June 21, 1861)²⁹
 - 2 Apricot Moorpark
 - 2 Peach Noblesse
 - 3 Pear Chaumantelle
 - 1 Cedrus deodara
 - 1 Wellingtonia gigantea (Sequoiadendron giganteum)
 - 3 Camellias
 - 2 Azalea hardy
 - 2 Azalea indica
 - 2 Magnolia grandiflora
 - 2 Rhododendron conspicuum
 - 1 Pyrus japonica (now Sorbus japonica)
 - 1 Arbutus sp.
 - 2 Juniperus spp. English and Swedish
 - 1 Broadleaf Myrtle (Myrtus sp)
 - 1 Narrow leaf Myrtle
 - 1 Wistaria sinensis
 - 1 English Yew (Taxus baccata)
 - 2 Tamarisk
 - 1 Whortleberry (?)
 - 2 Common sheoaks (?) (Casuarina spp.?)
 - 15 Roses

1863 - Seeds

Pinus canariensis
Pinus halepensis
Pinus muricata
Pinus pinea
Pinus insignis (now P. radiata)
Robinia pseudo-acacia
Tilija vulgaris
Eucalyptus spp.

²⁷Barnett, The history and development of tree planting in Canterbury.

²⁸Gardening papers: Acland Papers, Canterbury University Library.

²⁹Letter contained in the gardening papers of the Acland Papers, Canterbury University Library. A copy is in the appendices.

1866 - Trees (?)

- 1 Ash (Fraxinus excelsior?)
- 2 Double flowering cherry
- 3 Larch (Larix decidua)
- 2 Scotch fir (Pinus sylvestris?)
- 100 Seedlings
- 1 Spruce (Picea sp.)
- 6 Sycamore (Acer pseudoplatanus)
- 1 Thuja lobbii (syn. Thuja plicata)

1869 - Seeds

- Abies canadensis (now Picea glauca)
- Abies douglasii
- Abies excelsa (now Picea abies)
- Abies menziesii (now Picea sitchensis)
- Abies orientalis (now Picea orientalis)
- Cedrus atlantica
- Cedrus deodara
- Chamaecyparis lawsoniana
- Juniperus communis
- Juniperus virginiana
- Picea pinsapo (now Abies pinsapo)
- Pinus benthamiana (now Abies alba)
- Pinus jeffreyi (now Pinus ponderosa var. var. jeffreyi)
- Pinus lambertiana
- Pinus tuberculata (now Pinus attenuata)
- Sequoia sempervirens
- Taxus baccata
- Thuja gigantea
- Thuja lobbii (syn. Thuja plicata)
- Thuja occidentalis

Date unknown

- Picea pectinata (now Abies alba)
- Pinus sylvestris

2) Imported from Shepherd's Nursery, Sydney

1864 -

- Abies coerulea (probably Abies concolor)
- Cryptomeria japonica
- Juniperus spp.
- Libocedrus chilensis
- Pinus insignis (now Pinus radiata)

1866 -

- Abies khutrow (now Picea smithiana)
- Abies smithiana
- Abies bermuda (?)
- Abies coerulea (probably Abies concolor)
- Pinus insignis (now Pinus radiata)
- Pinus longifolia (now Pinus roxburghii)
- Pinus sabiniana
- Cephalotaxus sp
- Libocedrus chilensis
- Taxus japonica (now Cephalotaxus drupacea var. fastigiata)
- Araucaria cunninghamii
- Araucaria bidwillii
- Thuja falcata (?) (probably a variety of Thuja orientalis)

3) From Abbott's Nursery, Christchurch

Date unknown -

- Malus pumila (syn sylvestris)
- Sorbus terminalis

1866 -

- Sorbus aria
- Sorbus aucuparia
- Sorbus domestica
- Sorbus intermedia
- Sorbus latifolia



PHOTOGRAPH 13: The Pinus radiata planted by J.B.A. Acland in 1859.

Also contained in the 'garden' file of the Acland Papers,³⁰ there is a hand written list of the nursery stock cultivated and sold by Mr French of Timaru, dated 1865. Some of the plants at Mount Peel Station were purchased from this nurseryman but there is no record as to which plants.

In his diaries Acland has briefly recorded some of the stages of development in the garden.³¹ Some of the earliest references are to work done in 1859, when, in January a garden was dug in front of the weather-board house. In June, 1859, Smith and Tripp planted out some trees from Christchurch, and in September a new flower garden was laid out. Gradually the area was developed from these, tentative, beginnings and the basis of the mature garden of today was planted.

These following sequence of photographs is designed to show the development of the gardens, and landscape, in the homestead area of Mount Peel Station. The photographs are courtesy of the Canterbury University Library, and are contained in the Acland Papers collection with one courtesy of the Canterbury Museum.

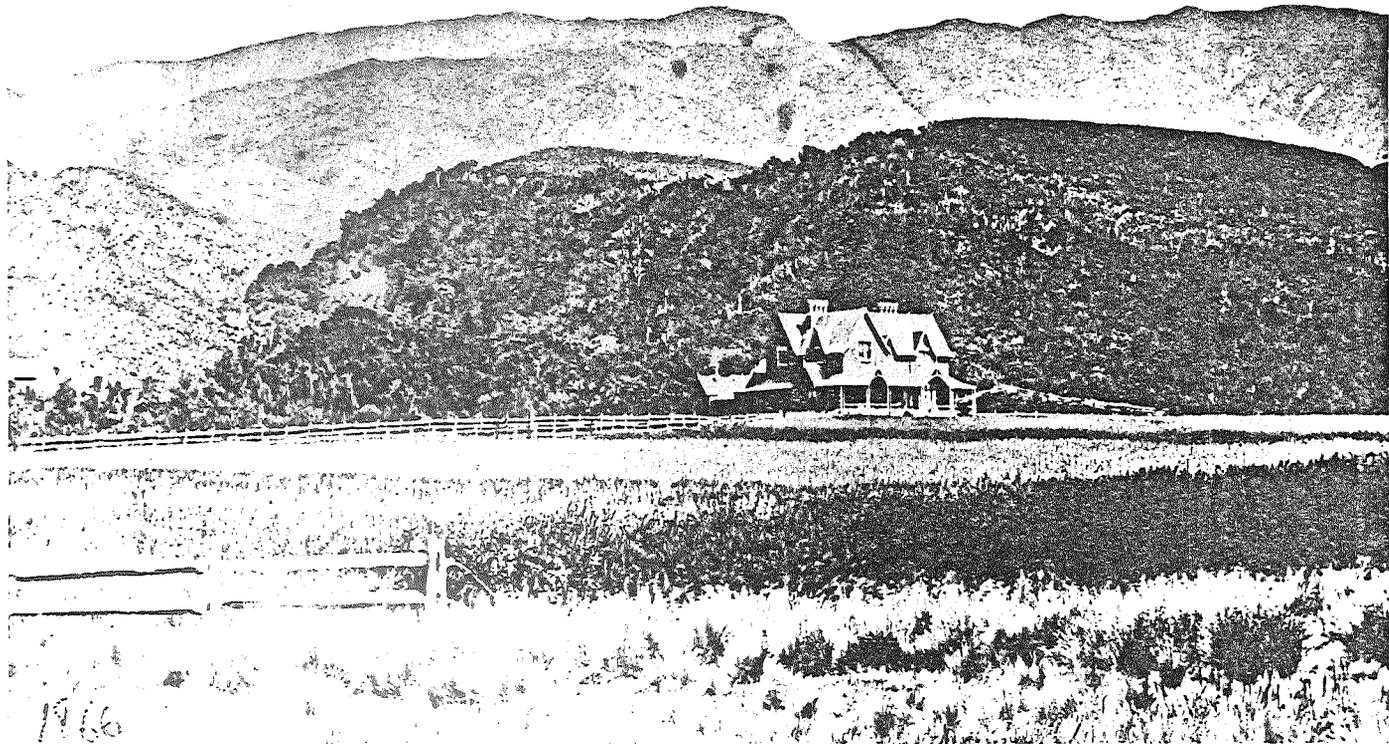
³⁰Gardening papers; Acland Papers, Canterbury University Library.

³¹J.B.A. Acland's Diaries; Acland Papers, Canterbury University Library.

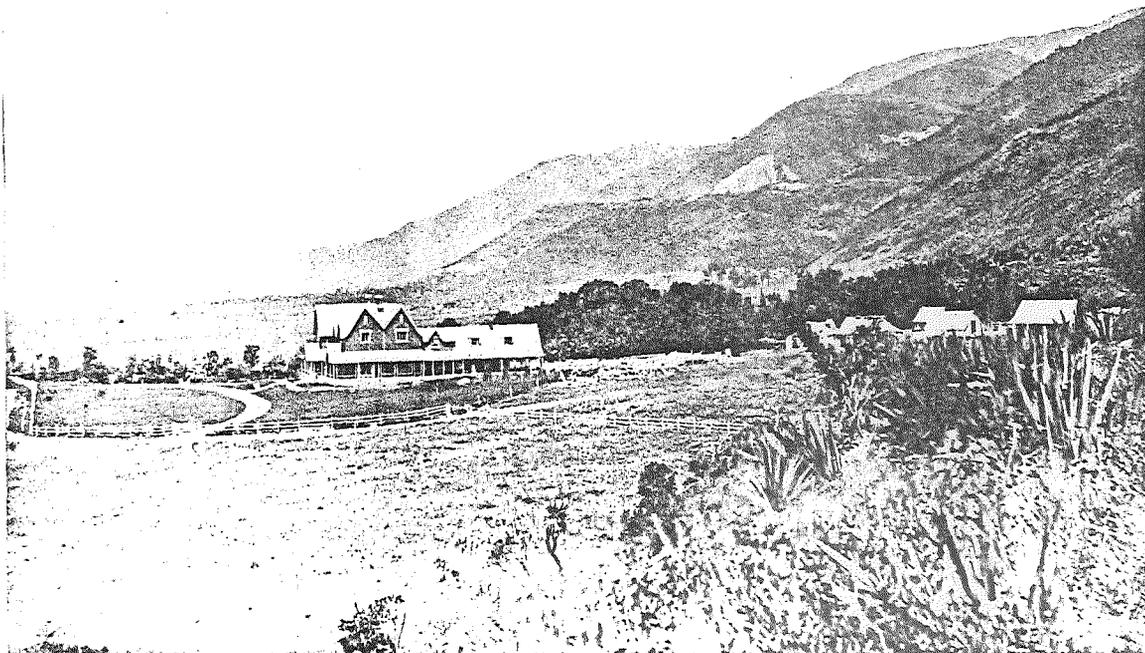


PHOTOGRAPH 14: (1866) Holnicote, shortly after its construction, sits in a landscape which is open pasture on the flat, much of the natural bush having been cleared up to the base of the hills.

Young trees had been raised from seed and planted out by this time, but the area is still dominated by the natural bush on the hillslopes.



PHOTOGRAPH 15: (taken sometime between 1857-1865). The first of the early homestead buildings sit in the lee of the surrounding hills and are further protected by the patch of natural bush in which they are sited. The weatherboard house which can be seen in the left of the photograph, was the residence of Mr and Mrs Tripp. The other buildings are the original cottages and whare.

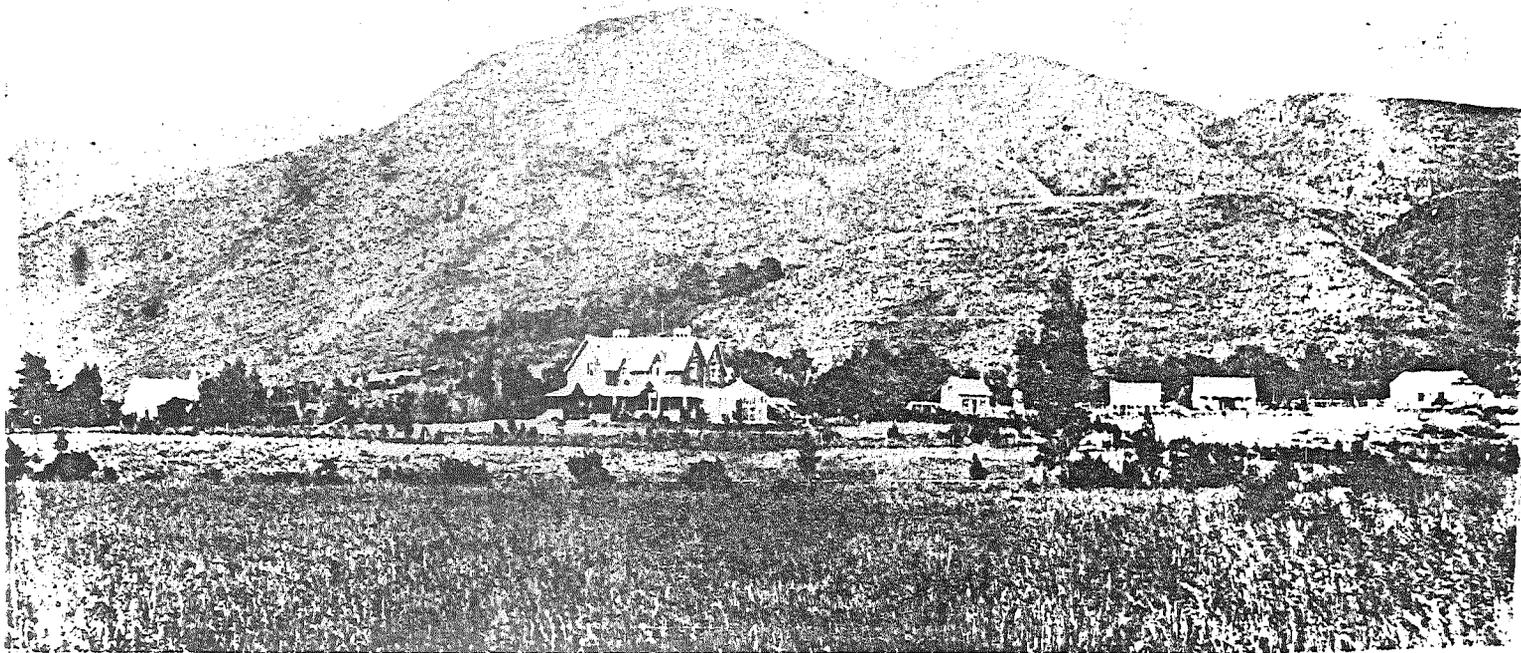


PHOTOGRAPH 16 : (1866-1868?) This photograph illustrates the way in which Holnicote originally sat in the landscape, surrounded by grassland, with a small cleared garden area.

The garden area had been fenced off to protect it from stock. The driveway in front of the homestead is still in the same position today.

The original cottages can be seen to the left, in a poor state of repair, as well as a couple of additional farm buildings.

Wait
Mt. Peel
Canterbury
NZ
Jan 27
72

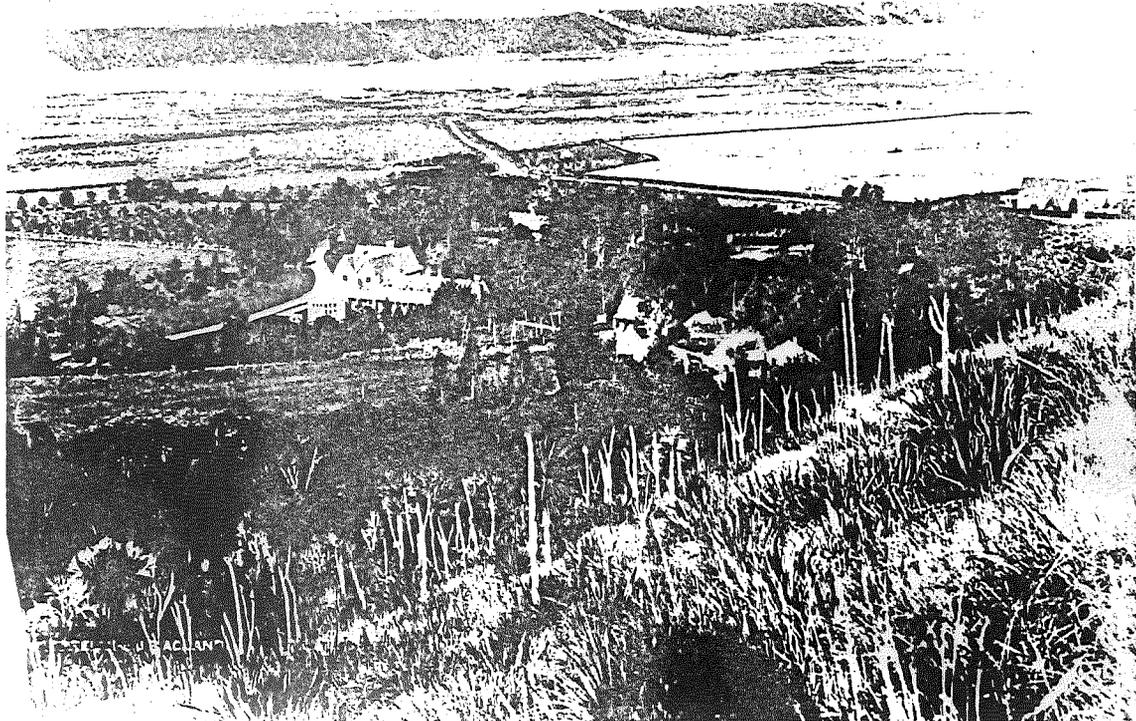


PHOTOGRAPH 17: (1872) The exotic planted in the garden area are beginning to dominate this part of the landscape. Much of the native bush has been removed and is no longer an important feature around the homestead area. Wait collection, A.C. Barker photograph, courtesy of the Canterbury Museum.



PHOTOGRAPHS 18 and 19: (mid 1890's) The exotic trees are now quite dominant in the homestead landscape. Their dark colours and strong forms are in marked contrast to the natural landscape with its tussock grassland and natural bush, containing rounded forms in shades of olive green.

Hedges have replaced the fencelines around the homestead and a well developed roading system can be seen connecting the important parts of the homestead area.



PHOTOGRAPH 19

The homestead area today is closely surrounded by many mature trees which totally dominate the area. The surrounding hillsides are also planted with exotic tree species. Some native species do, however, still exist in parts of the garden, living harmoniously in the shade of oaks, poplars and many coniferous tree species. (Refer to PHOTOGRAPH 20 below).



PHOTOGRAPH 20: Native plants (Grisellinia littoralis, Neopanax arboreum and large tree ferns) established beneath large exotic trees.

Many records have been kept of the rate of growth of the exotic trees in the Mount Peel gardens. Quite a few are well known as some of the largest trees, of their kind, in New Zealand. Table summarises the miscellaneous information to be found in the Acland Papers and other reports on trees and tree growth.

One of the more eye catching plants in the Mount Peel gardens is the Lilium giganteum (now Cardiocrinum). Imported from the Himalayas it has become naturalised beneath the trees. They form a striking feature in December when they carry creamy/white flowers on stalks up to 3 metres tall.

Over the years there have been a number of gardeners at Mount Peel Station, since about 1859.³² J. Chapman was the first gardener and he was followed by Edward Barrett. Barrett had been recommended to Acland by W. Wilson, of Christchurch,³³ and began his duties as gardener at Mount Peel in December 1867.

In 1874 W. Smith was the new gardener, staying at Mount Peel until 1880, and being followed by Moloney, Moffat, and John Jacob who worked in the gardens from 1900 to 1925.

The vegetable garden has remained in its present position at Mount Peel for over 120 years. It was the primary source of fresh vegetables for those who settled the station; until it was established they had to live on what they had brought with them and what

³² Typescript sheet courtesy of Mr and Mrs Acland, Mount Peel Station

³³ Letter of recommendation contained in the gardening papers of the Acland Papers, Canterbury University Library.

could be foraged from the bush. Having settled the station in May 1856, they had by Christmas of that year been able to grow some potatoes, peas, carrots and turnips, which were much enjoyed for Christmas dinner.³⁴

In his notebook, dated 1854, Acland listed the vegetable seeds he had brought from England.³⁵ The following is that list and a key to the dates that the seeds were planted.

bd	Asparagus	(Killerton)
cb	Beet	(red)
cb	Berberis	(Asiatica?)
c	Brocoli	(white)
cb	Cauliflower	(Killerton)
c	Celery	(dwarf white)
b	Cress	(American)
c	Cress	(curled)
d	Endive	(white Batavian)
d	Endive	(green curled)
cd	Endive	(white curled)
d	Kale	(Siberian)
bd	Lettuce	(white cross)
d	Lettuce	(white lilicia)
cd	Lettuce	(Victoria)
abc	Onion	(white)
bd	Parsley	(Killerton)
bc	Spinach	(prickly)
c	Sprouts	(Brussel)
c	Turnip	(mousetail)
cd	Turnip	(Craggs 6 weeks)
c	Tobacco	

³⁴Typescript sheet courtesy of Mr and Mrs Acland, Mount Peel Station

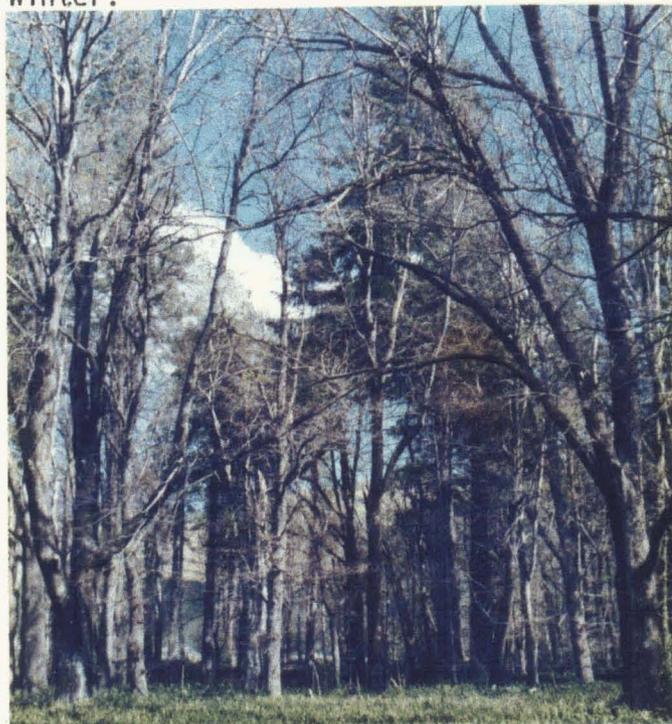
³⁵J.B.A. Acland's Notebook, dated 1854: Acland Papers, Canterbury University Library.

c Vegetable marrow
c Pumpkins

Key:

a sown July 24, (1856)
b sown August 18,20,21 (1856)
c sown November 2, (1856)
d sown November 20,21 (1856)

The tobacco apparently grew quite well when planted out in rows one metre apart. It would last two to three years if cut down and covered with 15cm of earth in winter.



PHOTOGRAPH 21: Mature oaks, with Iris foetidissima underneath, in the eastern area of the homestead garden.

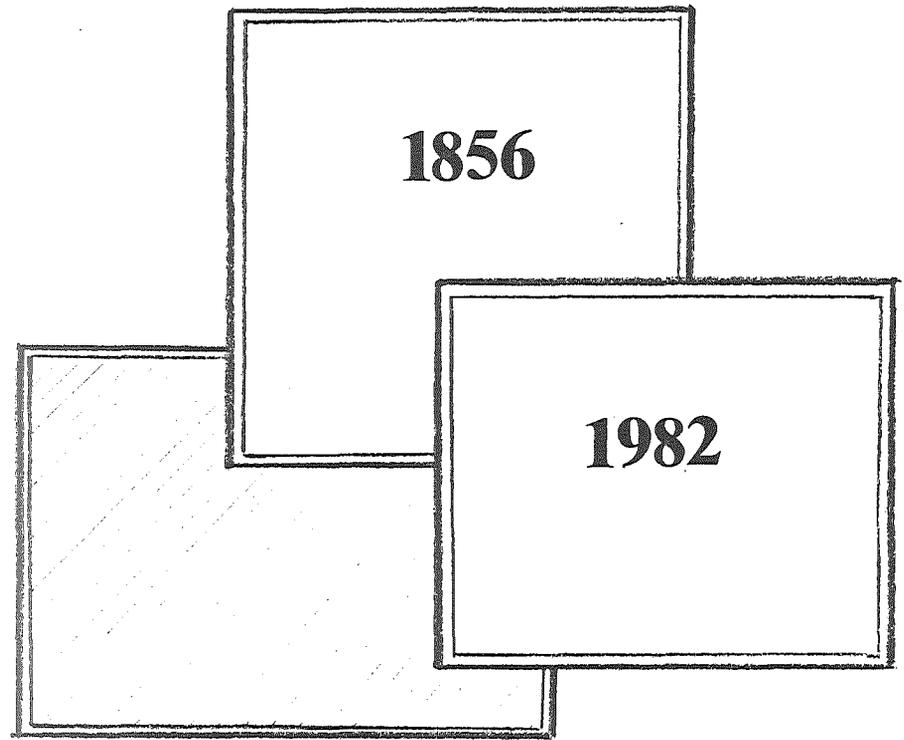
TABLE 3 : The growth rates of some of the Notable trees in the homestead gardens

NAME	ORIGIN	YEAR GERMINATED	YEAR PLANTED AT MOUNT PEEL	APPROXIMATE SIZE : (HEIGHT/GIRTH/SPREAD) m.							
				1885	1920	1934	1936	1955	1962	1967	1970
<u>Pinus radiata</u>	Australia	1856	1859	(18 /3.5/-)	(35.4/-/-)	37 /6.	37 /6.4/-	37 /8.3/-	38.5/ /-	17 /3.7/-	-/9 /-
<u>Sequoia gigantea</u>	Devon	1856	1859	12.2/2.4/-	26.8/-/-		32.3/7.5/-	35 /9.2/-	35 /- /-		-/10 /-
<u>Pseudotsuga menziesii</u>	Devon	1855	1859	18.6/ - /-	28.6/-/-		32.3/4.7/-		23.3/2/		38.4/9.6/- 40.3/9.7/-
<u>Larix decidua</u> (nut walk)	(?)	(?)	(?)		23.8/-/-	25.2/2/-	25.3/ - /-	29.9/- /-	31.4/- /-		
<u>Sequoia gigantea</u> (Bishop's Wellingtonia)	(?)	1862	1864								37.5/7.6/- 40.2/8.5/-
<u>Quercus robur</u> (Big Oak)	Devon (acorn)	1859	(?)		18.3/2.7/22.9						
<u>Pinus ponderosa</u>	Devon	(?)	1856-70(?)					39 /14/-	39.3/14 /-		
<u>Cryptomeria japonica</u>		(?)	(?)					- /8.3/-	28.3/9 /-		28.9/- /-
<u>Araucaria araucana</u>	Devon	1855	1859					- /10.4/-	18.9/11.3/-		
<u>Cedrus atlantica</u>	(?)	(?)	(?)					- /13.5/-	29.5/5.6/-		
<u>Cupressus lusitanica</u>		(?)	(?)						28 /13.9/-		
<u>Cedrus deodara</u>		1859	1878						17 /3.3/-		G.L. 27.4/9.4/-

SOURCE: Miscellaneous papers in the gardening papers of the Acland Papers, Canterbury University Library.

NOTE: Other information from the same source is also given in the appendix. It is however, difficult to assess whether the data is for the same tree, or different ones of the same species. For this reason the in-

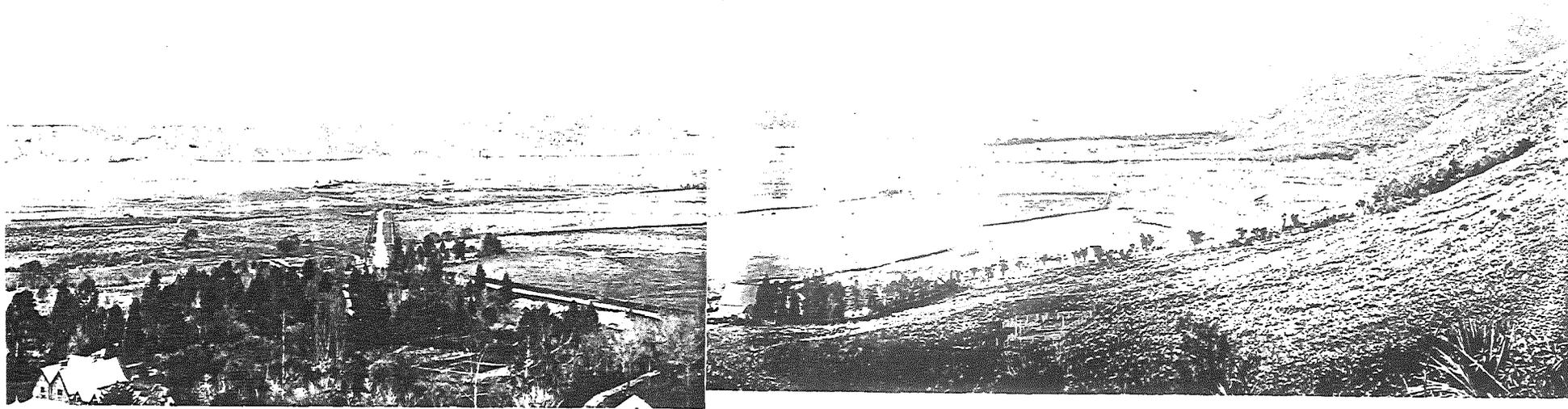
formation in the appendix has not been included in this chart: and for the same reason there may be some disparity in the chart.



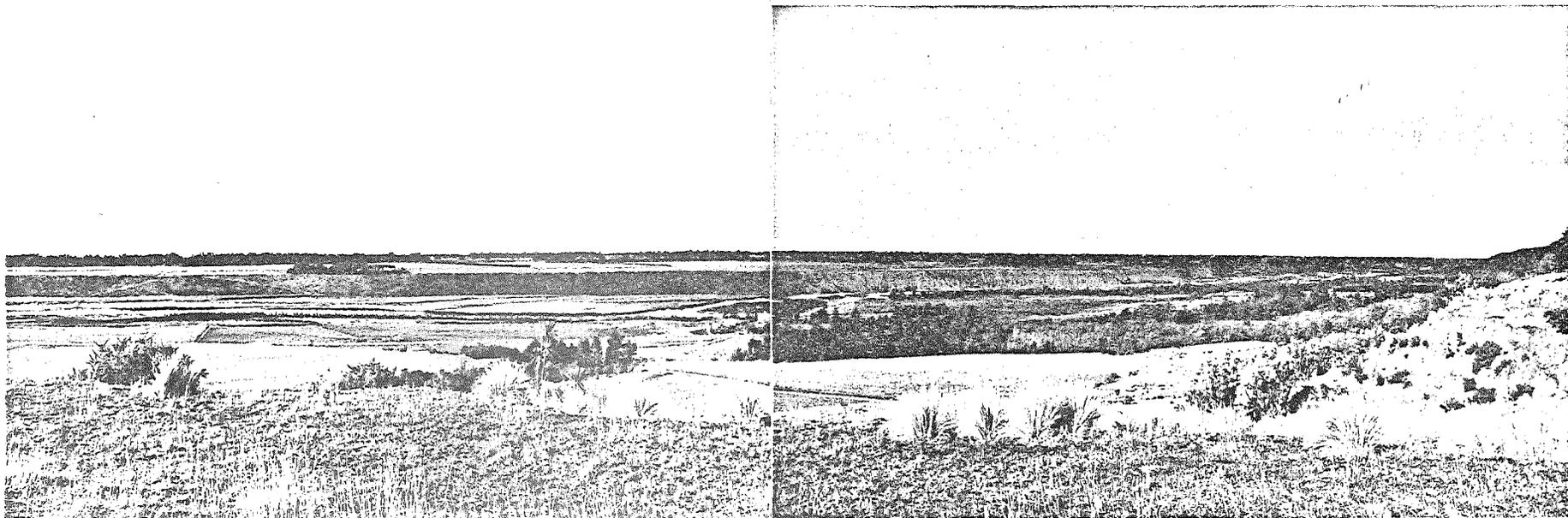
PART IV

A Photographic Survey





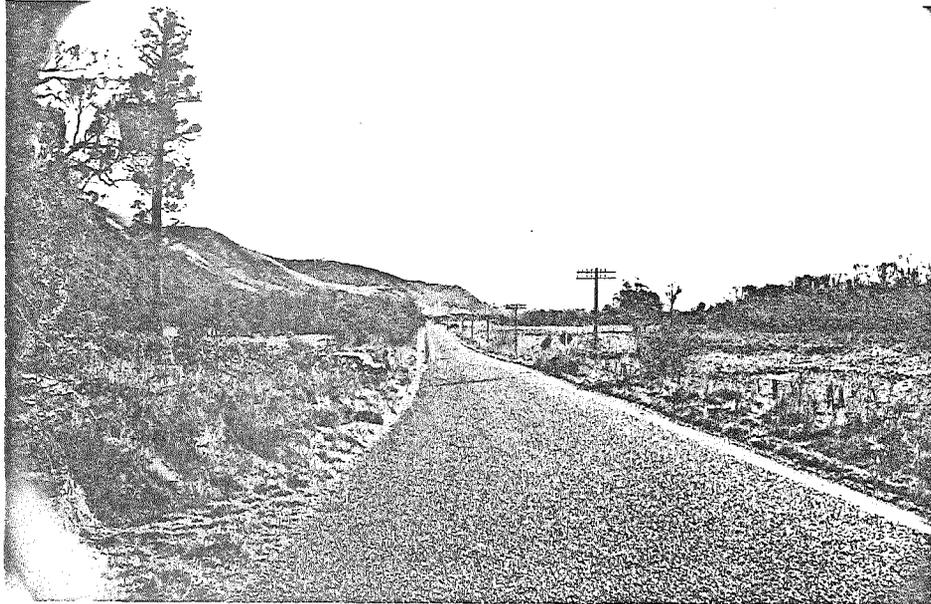
PHOTOGRAPH 22 : (about 1898) A panoramic view of the area of Mount Peel Station which borders along the Rangitata River. In the background the steep northern bank of the river can be seen and beyond this are the treeless Canterbury Plains. There are a number of important homestead buildings visible in the foreground. Courtesy of Mr and Mrs Acland.



PHOTOGRAPH 23 : (1982) A view across the homestead area and lower terraces to the northern bank of the Rangitata River. The Canterbury Plains in the distance are now marked with prominent shelter belts. A large number of paddocks are visible on the terraces and there are also some shelter belts established in this area.



PHOTGRAPH 24: (1896) 'Forest gate and hills' This is along the Rangitata Gorge Road leading from Peel Forest to Mount Peel Station, just inside the station's present eastern boundary.



PHOTOGRAPH 25: (1982) Rangitata Gorge Road. Some of the natural vegetation remains in the paddocks along the side of the road. The road itself is now tar sealed and the linear corridor is emphasised by the line of telegraph poles. The hills to the left are still bush clad as are some of the hills in the background of the photograph taken in 1896. Some naturalised clumps of willows are visible to the right, near the river.



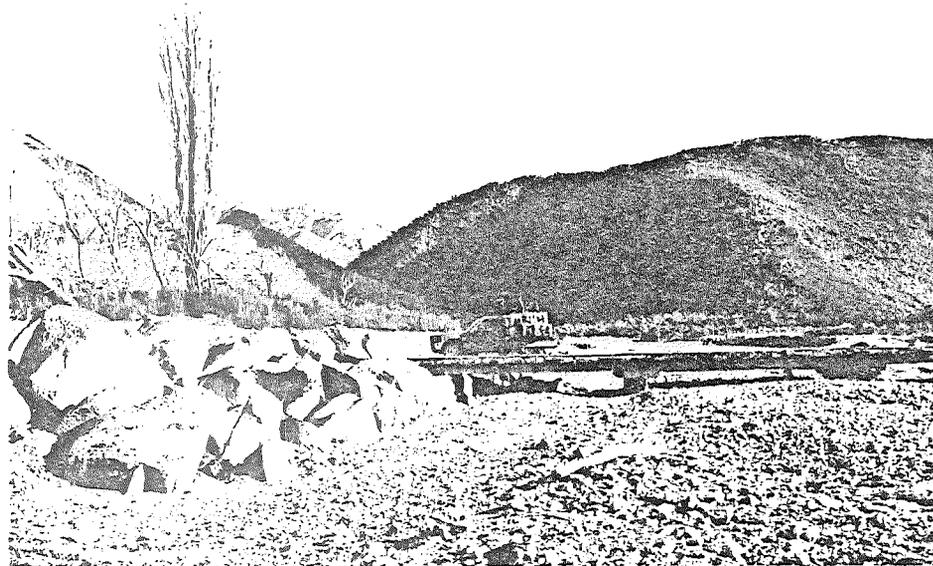
PHOTOGRAPH 26: (1896) 'From the forest looking up river'
The Rangitata River is visible to the left the view not
yet blocked by willows, as in photograph 25.



PHOTOGRAPH 27: (1898) 'The Rangitata riverbed (below Peel Forest Park?). Although there are large amounts of natural bush along the bank, a clump of gorse is visible in the middle of the photograph.



PHOTOGRAPH 28: (1898)'The Lynn Creek crossing'



PHOTOGRAPH 29: (1982) The Lynn Stream crossing. The natural natural bush has receded and exotic weed species now colonise the edges of the riverbed. The large boulders have been placed along the riverbed to control the considerable erosion which occurs every time the river floods.



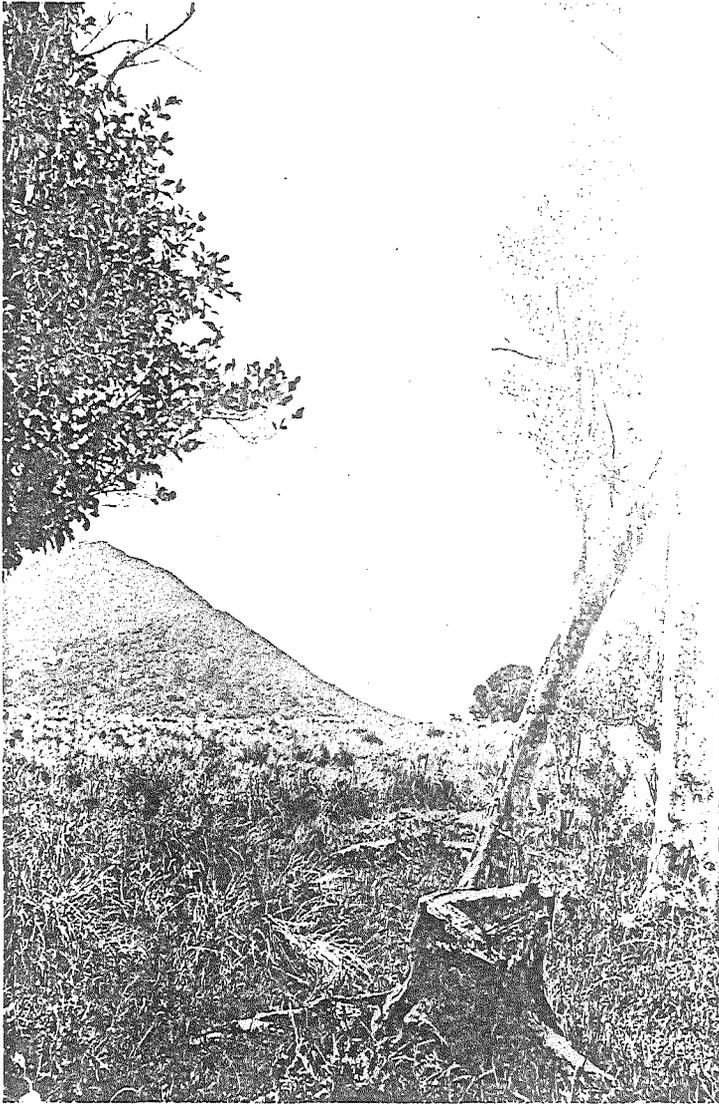
PHOTOGRAPH 30: (1982) Looking up the valley of the Lynn Stream, there is natural bush present, especially on the shady eastern slopes. On the left hand side colonies of gorse are visible on the hillside, as well as a prominent block of forestry. The hole in the middle of this forestry block is a patch of gorse and barberry.



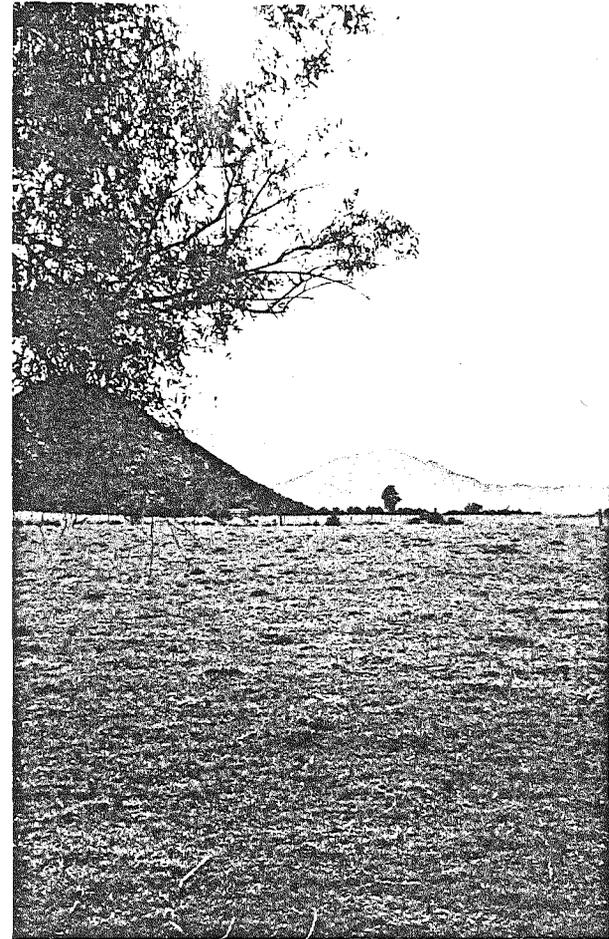
PHOTOGRAPH 31: (1898) Natural bush along the upper reaches of the Lynn Stream, Mount Peel is visible in the background.



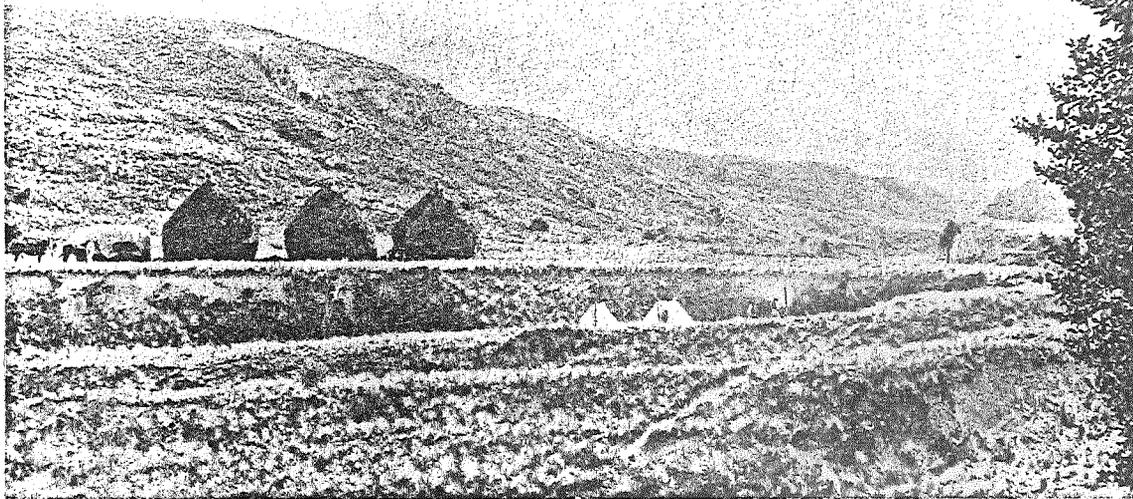
PHOTOGRAPH 32: (1898) 'Looking across Burke's Flat'
The hills to the west of the homestead area as seen from
the lower downlands, with mixed tussock/exotic grassland
and wooded gullies.



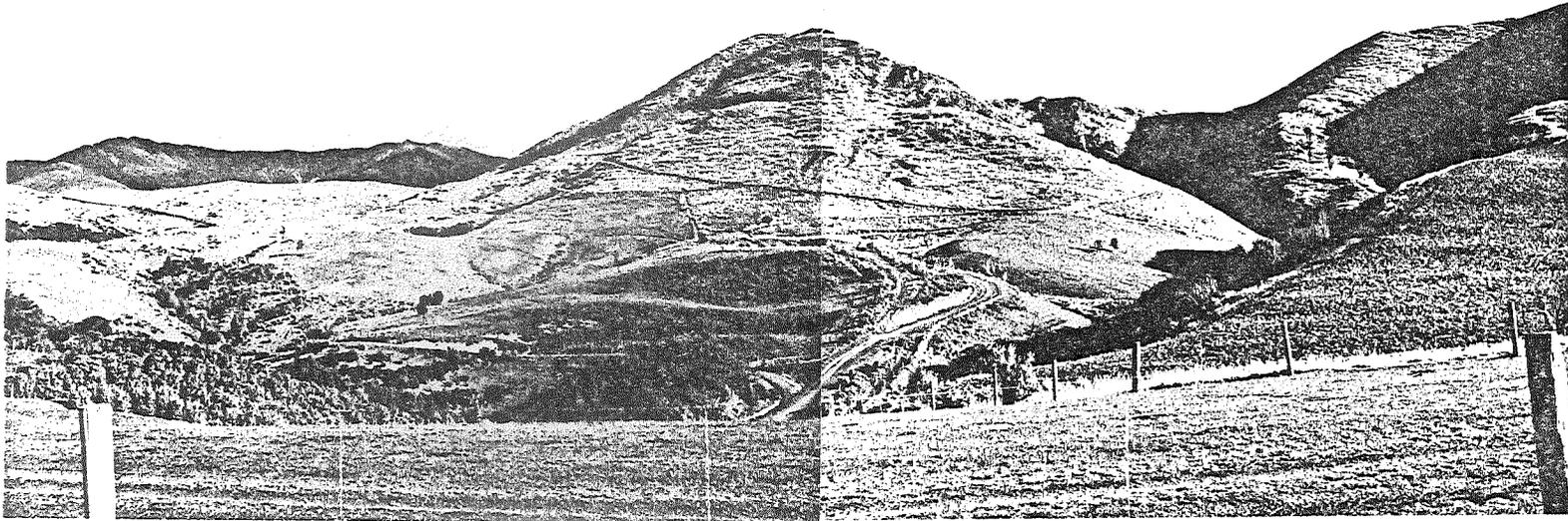
PHOTOGRAPH 33: (1898) 'Razor-back from
Barker's Flat'



PHOTOGRAPH 34 : (1982) The razor-back
from Barker's Flat showing the changes
in the texture of the grassland and
the reduction in native tree species.
The clump of trees from which the
original photograph was taken is still
in existence on a middle river terrace.



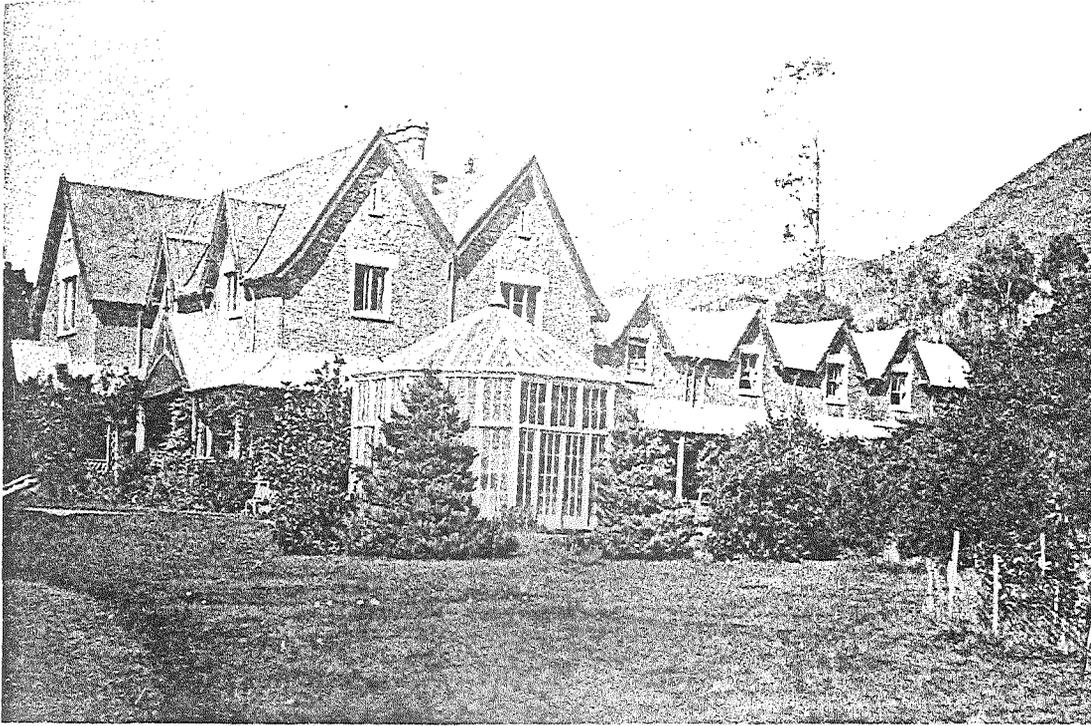
PHOTOGRAPH 35: (March 1897) 'Oat stacks in the 2nd gully'
As shown by this photograph the oats were grown on the river terraces and the resultant oat stacks introduced new and dominant forms into the landscape. Another point to note is the Jack of shelter in the agricultural landscape; by this time the homestead area had a large number of semi-mature trees.



PHOTOGRAPH 36 : (1982) The upper terraces and lower downlands behind the homestead area. The natural tussock grassland has been replaced by exotic pasture with many new paddocks being used for crops. There are still some patches of natural bush in the gullies. Scattered gorse plants are visible on the hillside and another important feature are the access roads cut into the hillside.



PHOTOGRAPH 37: (about 1898) View of the homestead area.



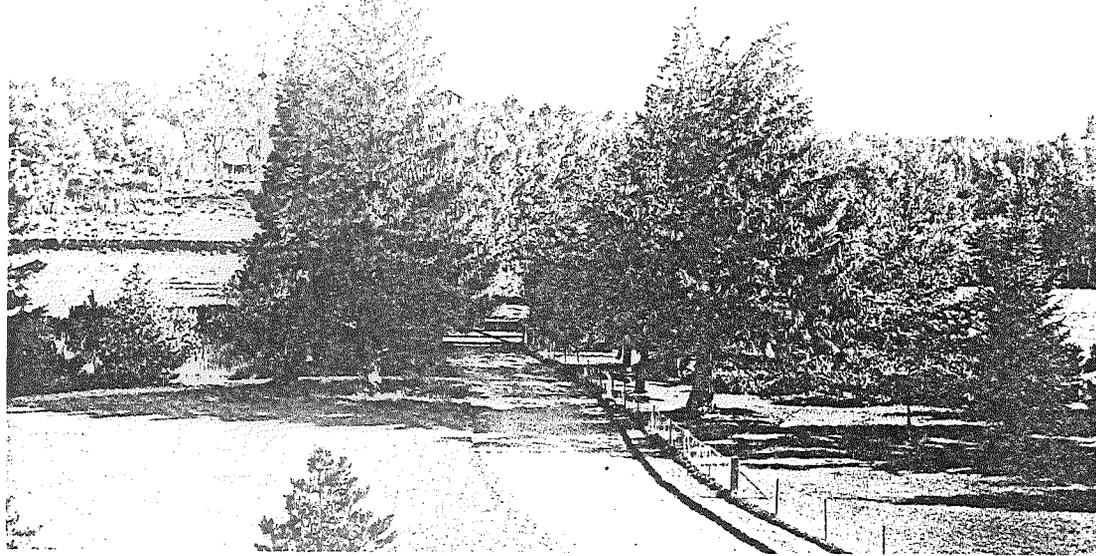
PHOTOGRAPH 38 : (1898) Mount Peel
homestead.



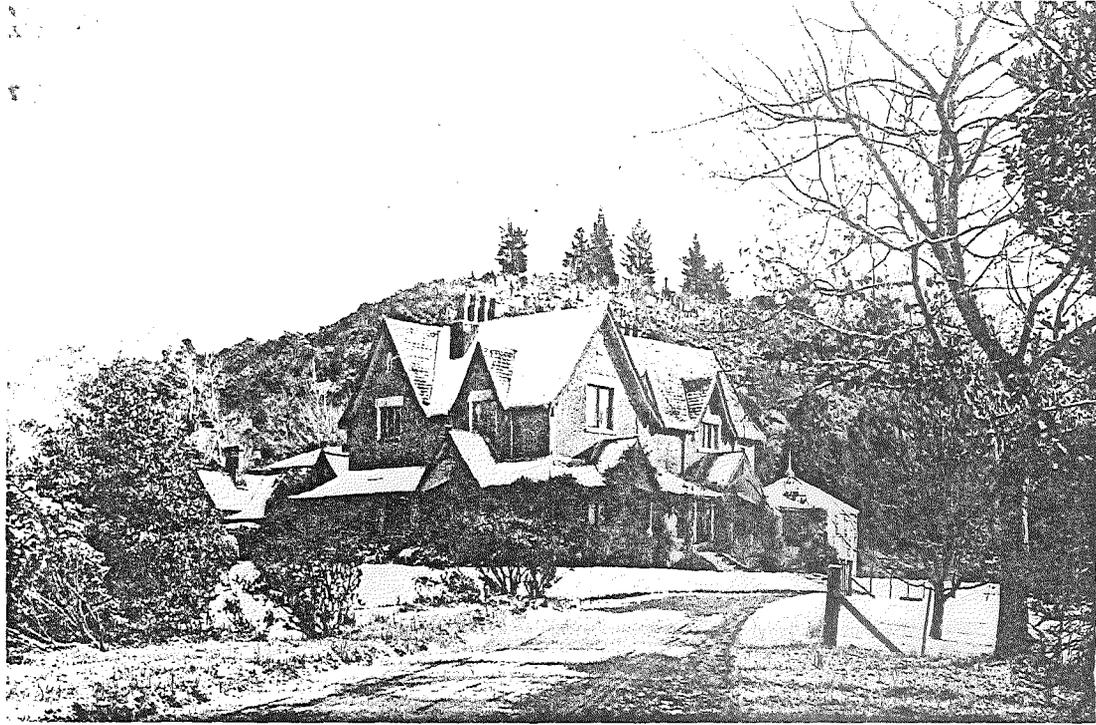
PHOTOGRAPH 39 : (1982) Mount Peel
homestead



PHOTOGRAPHS 40-45: (1898) Mount Peel Station homestead and gardens.



PHOTOGRAPH 41:



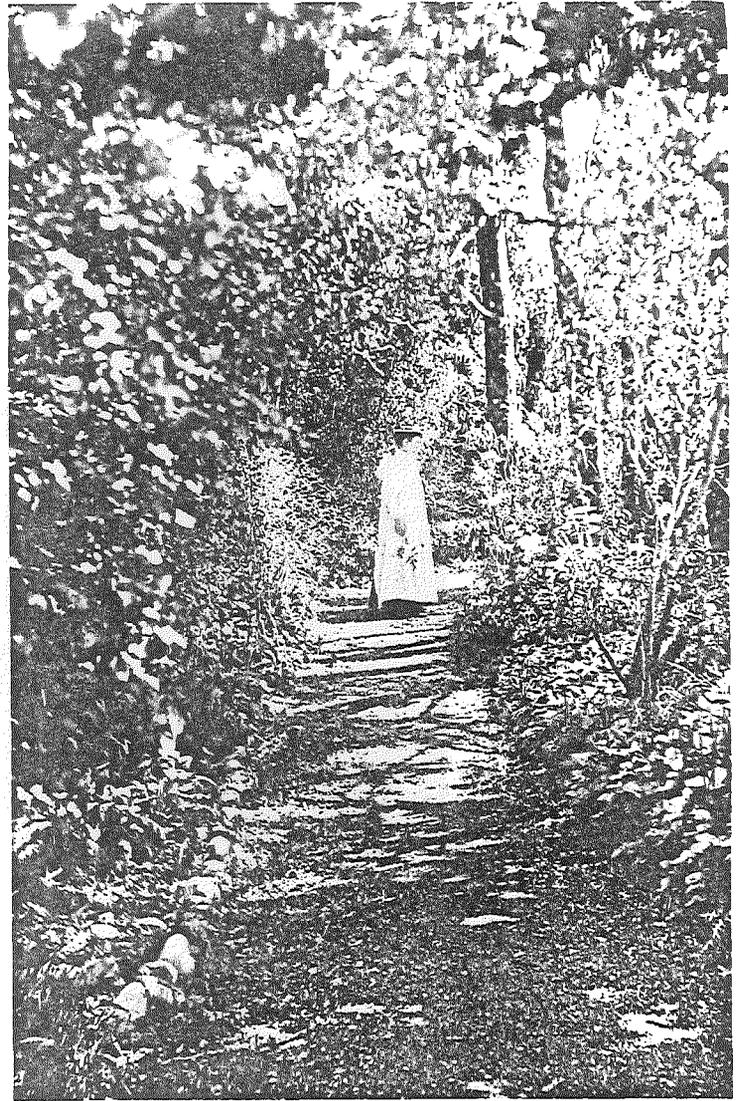
PHOTOGRAPH 42:



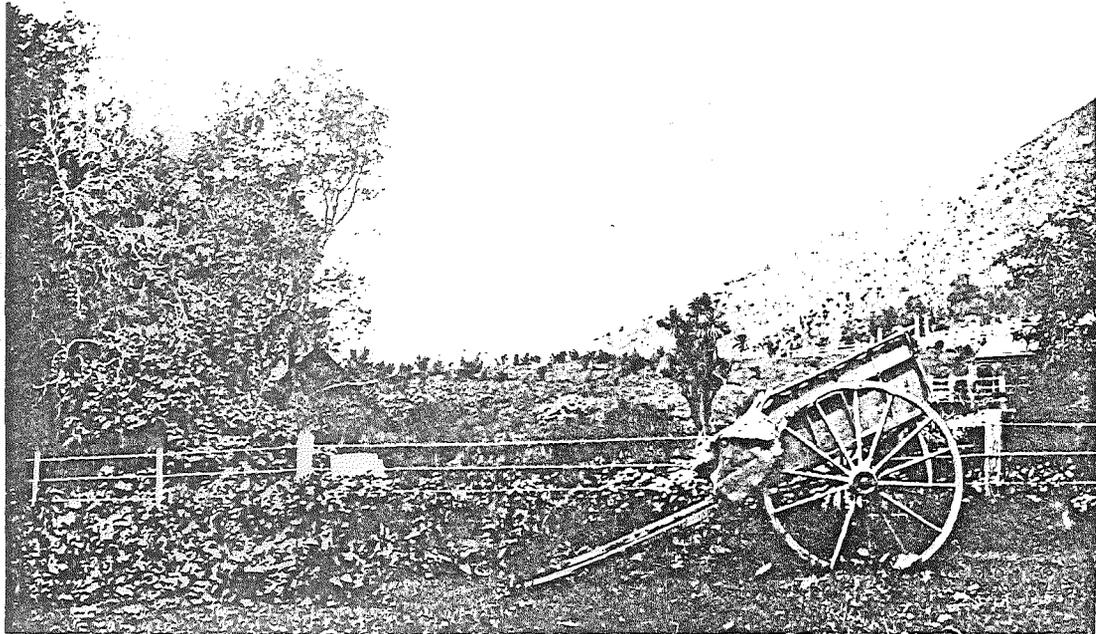
PHOTOGRAPH 43:



PHOTOGRAPH 44:



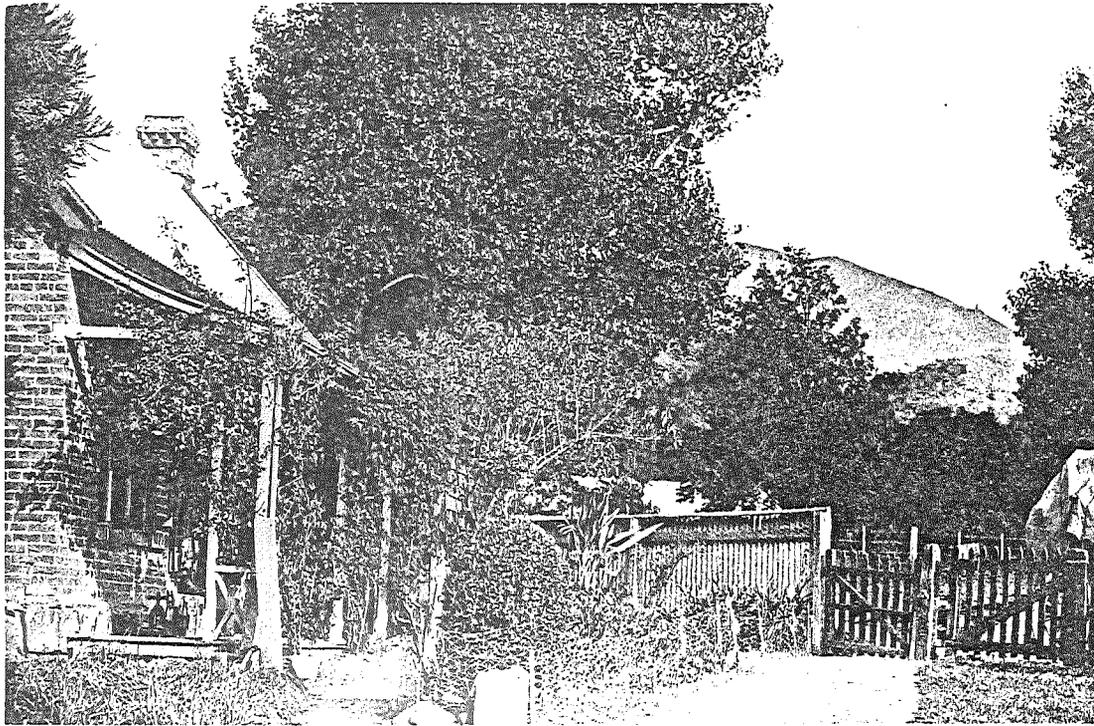
PHOTOGRAPH 45:



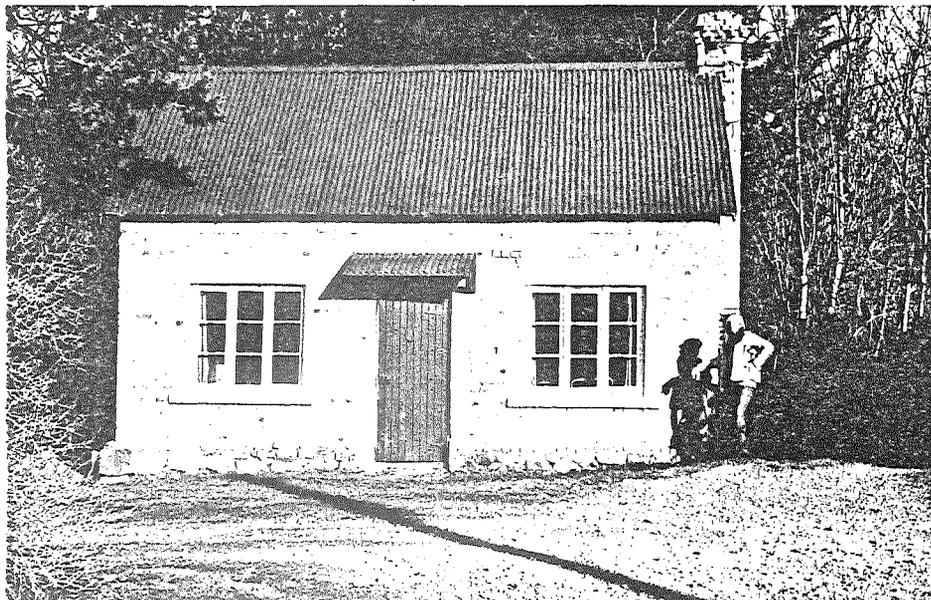
PHOTOGRAPH 46: (1898) 'View from the stables' This view of the landscape is to the homestead.



PHOTOGRAPH 47: (about 1898) 'Station house' This building no longer exists but it was situated on the hill to the west of the homestead area.



PHOTOGRAPH 48: (about 1898) The cottage behind the homestead.



PHOTOGRAPH 49: (1982) The cottage behind the homestead.

Appendix

(1) J.B.A. ACLAND BIOGRAPHY FROM THE
CANTERBURY MUSEUM BIOGRAPHY CARDS.

ACLAND, J.B.A. 1823-1904, sixth son of
Sir Thomas Dyke. Born Killerton, Somerset,
England.

Educated at Harrow and Christchurch,
Oxford - took B.A. with honours in maths
in 1845.

Studied law and called to the Bar, being a
member of Lincolns Inn. He and Charles
Tripp, another W. Comily man, sailed
together in the Royal Stuart and landed at
Lyttleton 4.1.55.

Worked as a cadet for H.J. Tancred at
Malvern Hills.

Late 1855 he and Tripp set out to look for
sheep country. Found all easy country
taken and capital of 2,000 each insuffi-
cient to buy a run which was already star-
ted. They took up hill country and al-
though they were laughed at and discouraged
by others they stuck to their idea.

Put their first sheep on Ben Moorhouse's
Sherherds Bush Station until they were
ready to receive them.

In four years they had successfully applied
for 250,000 acres which included Mount
Peel, Orari Gorge, Mount Somers and parts
of Hakatere and Mesopotamia Stations.

Had 2700 sheep by 1858.

They explored the headwaters of the
Rangitata, Orari and Ashburton Rivers.

The partnership dissolved in 1862 with
Acland on Mount Peel with 100,000 acres.
Tripp sold Mount Somers while Acland was
in England, the farm being short of cash.

Acland was one of those who hoped to make
an estate on the model of an English
manor; with a manor house, chapel and
cottages. Others who had the same ambition
were Richard Bethell, and Charles Reed of
Westerfield. Started building cottages
soon after they took over Mount Peel hoping
that men would settle down and raise fam-
ilies on the station. House built of
bricks baked on the site by Ben Ede of
Ashburton and J. Fitzgerald of Arowhenua.

Lord Lyttleton on his tour of Canterbury
stayed there and approved it.

1869 Church:Brassington, well know for his
work on the Provincial Council Chambers
came 'up' from Christchurch to build it.
Boulders from the riverbed and carted lime
from Mount Somers for mortar. Bishop
Harper consecrated it 12/12/69. J.B.A.
and Emily Acland are buried there.

In a farm review of South Canterbury, the
Lyttleton Times reporter refers to "the
beautiful mansions and grounds of the Hon.
J.B. Acland which were an object of
admiration in the days when the coach used
the upper ferry."

1865 nominated a member of the Legislative
Council and he remained an active member
for 34 years.

Elected to Geraldine Roads oard in 1864.

Chairman of Mount Peel Roads Board 1870-1900.

Fellow of Christ's College.

Member of Canterbury College Board and of the Senate of the University of N.Z.

Preached regularly at Mount Peel, being a lay reader.

Lay member of the Diocesan Synod and was one of the three lay members of the first general Synod of N.Z. which was held in Wellington 1/3/59 and again in 1868. Perhaps his church work meant more to him than any other of his activities.

Far from being a natural farmer - appeared to have very little natural liking or understanding of stock and not a great deal more of men. A.J. Blakiston said he did not recognise his head shepherd that he had employed for ten years.

Great tree planter and good with bees.

Another hobby was the turning of wood or ivory.

Father died in Killerton in July 1871, aged 84. In June 1861 a statue had been erected in his honour, in Northern Hay, a pleasure ground of Exeter. He represented Devonshire in Parliament 1812-8 and 1820-23, 1837-57.

Founder member of the Christchurch Club and for some years had a house and 74 acres at Opawa. Advertised for sale October 1873. 50,000 acres at Mount Peel resumed by the Government for closed settlement in 1912 and 25,830 sheep were sold. Sale organised by his son H.D. Acland, prices were good.

Married at St Michaels 17/1/60 to Emily Weddell, eldest daughter of Bishop Harper.

It was a double wedding (the second in the Harper family), Percy Cox and Sarah Harper married on the same day.

Sons:

John Dyke Born 1863 Died 24/4/1944

Educated at Christ's College, 1874-81, Christchurch, Oxford.

Married at Rugby 14/5/02 to Mary Eveline, eldest daughter of the Rev. Canon St Hill of Hawkes Bay.

Managed Mount Peel after Mylton died 1880-85, Christchurch, Oxford. B.A. Allerton, Somerset.

Henry Dyke Born 1867 Died 12/2/42

Educated at Christ's College, 1880-85, Christchurch Oxford. B.A. Barrister and solicitor N.S.W. 1902.

Member and chairman of the Canterbury College Board of Governors

Fellow N.Z. University Senate

Member N.Z. Wool Board

President N.Z. Sheepowners Union

Married in Australia to Elizabeth Grace Watson.

Hugh Thomas Dyke Born 1874 Died (?)

Distinguished surgeon, knighted 1933

Married 15/4/03 to Evelyn Mary, daughter of L.J. Ovans of Dorchester.

Member of the North Canterbury Hospital Board for 21 years.

Managed Mount Peel after Mylton died 1880-85, Christchurch, Oxford. Formed at Lynchmead, Allerton, Somerset.

Daughters;

Agnes Dyke Born 1861

Married 15/9/85 to Walter Simpson, eldest son of Rev Arthur Simpson (headmaster of Wanganui College).

Mary Born 1865 Died 1916
Married to Frederick Villebois Lysaght

Harriet Born 1866 Died 1946
Married to Mayor Archibald Spencer

Lucy Born 1869 Died 1903
Married to Oliver Scott hompson 19/1/1898

Elizabeth Born 1870 Died (?)
Married to Charles Arthur Dunn, a cadet at Orari Gorge.

Emily Rosa Dyke Born 1873 Died (?)
Married to Herbert Besthion Williams (Bangor)

J.B.A. Acland transmitted to his family strong character and considerable ability. They gave much work to public service (and of course their mother was a Harper).

His grandson Jack Acland, son of Sir Hugh, was a member of parliament and a member of the N.Z. Wool board and chairman (knighted Sir John Acland, date (?))

Great grandson, John Acland, presently manages Mount Peel Station.

(2) LETTERS

SOURCE: The original letters are contained in the gardening papers of the Acland papers, Canterbury University library

LETTER: TO J.B.A. ACLAND?
FROM JAMES VEITCH AND SON

DATED: 21 June, 1861

"Sir on a summarised sheet is a list of plants in the case for J.B. Acland Esq. as requested.

Yours sir,
(signed) James Veitch and Son"

"2 Apricot Moorpark
2 Peach Noblesse
3 Pear Chaumantelle
1 Cedrus Deodara
1 Wellingtonia gigantea
3 Camellias
2 Azalea indica
2 Azalea Hardy
2 Magnolias grandiflora
2 Rhododendrons conspicuum
1 Pyrus japonica
1 Arbutus
2 Juniperus English and Swedish
1 Broadleaf Myrtle
1 Narrow leaf Myrtle
1 Wistaria sinensis
1 English Yew
2 Tamarisk
1 Whortleberry?
2 Common (sheoaks)?
15 Roses"

LETTER: TO J.B.A. ACLAND
FROM JAMES VEITCH

DATED: 18 November, 1864

"Sir

By desire of Mrs Mills I herewith beg to enclose a packet of Seed of the Lapageric 'Rosea' which I hope will turn out satisfactory.

Mrs Mills wished me to send to you some Seed of the Deodara and Wellingtonia but all the seeds of the former that have arrived in this country have turned out useless and the Wellingtonia I have been unable to procure in time and should I succeed in getting it will forward some by a late mail.

Hope the enclosed will safely reach you.

I am Sir
(signed) James Veitch"

Added note to letter: "November, (1861?).
Veitch sent 200 Deodara seeds fresh imported from India and a small packet of Wellingtonia seeds from California."

LETTER: TO MRS MILLS
FROM JAMES VEITCH

DATED: 16 September

" I duly received your favour of the 29th (?) respecting plants and fruit trees for New Zealand.

With the exception of the Fruit Trees, which will not be ready to pack up for

another fortnight, I have packed the whole of your kind order. The plants occupy nearly 2 cases and when the Fruit Trees are added the 2 cases will be quite full.

By the end of October the plants will be all well established and I think have a fair chance of reaching their destination in good condition.

I have made a selection of the very best kinds of Roses, Rhododendrons, etc. Taking care that the plants are all well ripened and most suitable to stand so long a voyage.

etc
(signed) James Veitch

LETTER: TO J.B.A. ACLAND
FROM JAMES VEITCH

DATED: 7 November, 1861

"Sir

I duly record your letters from Killerton and also from Poudeckam Castle. I regret the one from Killerton was not forwarded by post as we could then have sent off your case of plants by the midday train today but not getting your letter in time we could only send it by this days evening (____?) but it ought to be in London tomorrow and delivered Saturday morning. We had not received any instructions from J.W. Wansey but have addressed the case as you desired to Ms Stephens 90 Bishopsgate. I put within and shall advise him by this nights post upon having done so it is gone

by the South Western Rail to Waterloo Station it being near the docks at Paddington. We will also write by this Post to J.W. Wansey and I trust the case will be all in good time, as for the plants being so well established in the case I have every hope of their reaching their destination in good order. I think it will be better to keep the case closed during the voyage. If any glass gets broken to sea it is (safe to replace any) glass (by) a piece of wood. I don't think the plants will require water on the voyage.

It would be very desirable to get the case placed on the Poop to prevent salt water getting in by which we have lately lost several valuable cases of plants from Japan the cases being quite saturated in salt. I enclose as you desire the Bill of the plants sent last spring and of the case now forwarded. For the Box sent to London last year but which was not shipped there is no charge. I trust you will have a safe and pleasant passage.

I remain respectfully yours
(signed) James Veitch"

LETTER: TO SIR HUGH ACLAND
FROM M.J. BARNETT, Superintendent
of the Christchurch City Council
Office of Parks and Reserves and
Plantations Department.

DATED: 22 November, 1945

"Dear Sir,

At the annual conference of the Royal

N.Z. Institute of Horticulture to be held in Timaru in February, I have been chosen to give the Banks' lecture, and have selected as my subject "The History and Development of Tree Planting in Canterbury."

I am therefore desirous of obtaining authentic information on the early introduction and planting of exotic trees by those who pioneered this project. Would you be so kind as to supply me with information relative to the dates of introduction of seed or plants of the various trees that have been made use of, together with dates and places of planting and the results obtained. If there is any information which you might consider of interest, I would be pleased to receive it also.

As the time between now and the date of the lecture is somewhat short, it would be appreciated if you could give this matter your early attention.

Yours faithfully,
(signed) M.J. Barnett,
Superintendent"

SOURCE: Contained in a copy of the Journal of the Royal New Zealand Institute of Horticulture, July 1946, Volume 16, No 1, in the cataloged garden papers of the Acland Papers, Canterbury University Library.

INFORMATION EXTRACTED FROM A LETTER
TO SIR JOHN ACLAND
FROM BANKSIA COTTAGE, 18 RUE BALGUERI,
AKAROA

DATED: 9 March, 1978

The verandah rose is 'Blush Noisette' and has been Canterbury gardens for over 100 years. It was originally raised in South Carolina by Phillipe Noisette, who sent cuttings to his brother, Louis, in France. From there it probably reached England and the question of its delivery to New Zealand from Exeter Nurseries is speculated upon.

(3) TREE NOTES

Cedrus deodara

1970: girth at ground level 9.4 m
height 37.36m

The seed was imported in 1859 and planted by W. W. Smith in 1878.

Picea sitchensis

(in the right hand corner of the Churchyard)

1970: diameter at breast height 1.8 m
height 39.8 m

'The largest of this species recorded'

Pinus ponderosa

(in the Churchyard near the Sitka spruce)

1970: diameter at breast height 0.7 m
height 26.1 m

'An unusual type with a slender, closely-stocked top, tapering to a point at the top. Completely unlike the conventional bushy, bottle brush top.'

Pinus radiata

1970: diameter at breast height 2.4 m
height 38 m
spread 38 m

'This huge tree is a mass of large malformed branches from 3 metres above ground level. About 1953 one large section of these branches fell from it, producing about seven cords of wood. Planted in 1859 it is one of the oldest trees of this species in New Zealand and, in terms of actual wood content, could be one of the largest in the world. There is no other

P. radiata known to have such a spread.'

Anaucaria araucana

1970: diameter at breast height 3.7 m
height 17 m

'The largest of many such trees in South Canterbury.'

Ilex aquifolium

1970: girth at 0.3m 2.4 m
height 6.7 m
spread 10.6 m

Pinus pinea

1970: diameter at breast height 1.3 m
height 13.5 m
spread 18.3 m

'Planted about 1861, it is one of the larger of two, heavily branched trees planted about this time.'

Pseudotsuga menziesii

1970: diameter at breast height 1.8 m
height 39.8 m

Planted 1869.

SOURCE: Burstall, Historic and notable trees of New Zealand : North Canterbury, South Canterbury, and Chatam Islands (unpublished report).

TREE MEASUREMENTS (12.6.62)

height (m) girth (m)

Sequoia gigantea

Mount Peel	26.8	6.4
Mount Peel (1934)	31	5.5
Drive	25.2	4.7
NE Empson's Copse	24.6	3.1
N Drive W		4.6
N Drive E		3.6

Larix decidua

Mount Peel Church- yard N	24.6	2.3
Mount Peel Church- yard S		2.3
Mount Peel Church- yard (1934)	25.2	2.4
Nutwalk	23.7	2.0
Empson's Copse		1.8
Drive 1st gate		1.8

Picea sitchensis

NW Churchyard	24.3	4.0
---------------	------	-----

Picea excelsa

Churchyard	17.0	1.9
West of drive (North gate)	25.8	3.0

Populus nigra 'Italica'

SE	33.4	3.0
SE (1934)	34.7	3.6
W		2.9
W (1934)		5.1

N		3.0
N (1934)		3.6
<u>Quercus robur</u>		
seedbed	18.2	2.7
nutwalk W		2.2
<u>Cedrus deodara</u>		
W of middle bridle walk	17.0	3.3
<u>Pinus insignis</u>		
Planted (1860)	35.3	5.4
(1934)	38.0	6.2
<u>Cupressus atensis</u> (?) var. 'Pendula'		
	12.2	1.9
<u>Cedrus atlantica</u>		
E lawn	19.0	2.0
<u>Cryptomeria japonica</u>		
Nutwalk	18.2	1.6
Nutwalk (1934)		1.8
<u>Pinus coulteri</u>		2.2
<u>Cupressus goveniana</u>		
old drive gates E		2.1
<u>Eucalyptus gunnii</u>		
east of group of trees	28.8	4.2
west of group of trees	23.4	3.0

Seedling <u>Eucalyptus</u>		
in brush	10.4	.33
in drive W, <u>E. obliqua</u> (?)	21.3	3.7
in drive E, by first gate	30.7	3.3
<u>Araucaria</u> sp.		2.0
<u>Picea alba</u>		
west		1.9
north of house		1.5
<u>Ulmus</u> sp.		
north of house		1.6

SOURCE: Gardening papers, Acland Papers, Canterbury University Library.

J.B.A. Acland's diary July 20, 1865.

A reference is made to Juniperus goviniana
Berberis fortunei

SOIL NAME AND SOIL GROUP	PARENT MATERIAL	NATIVE VEGETATION	TOPOGRAPHY	SOIL TYPE	NATURAL NUTRIENT STATUS	PRESENT USES	CARRYING CAPACITY (EWES/ACRE) PRESENT POTENTIAL	POTENTIAL USES	RESPONSE TO PASTURE TOPDRESSING	LIABILITY TO SOIL EROSION	RAINFALL p.a. (mm)
(A) MOUNTAIN SOILS											
KAIKOURA STEEPLAND (Upland and high country yellow brown earths)	Greywacke and greywacke detritus. Also localised accretion of soil blown from neighbouring slopes.	Snow tussock grass grassland with sub-alpine scrub in places; small area of beech forest.	Steep to very steep, mainly graded slope deposits (27-38°) with rock outcrops; also rocky bluffs; narrow rolling ridge crests and some 'razorback' ridges with crumbling rock. (1000-1675m)	Crumb/nutty silt loam; very friable on greywacke rubble.	Very Low	Very extensive sheep production and grassland protection.	1:20 ?	Protection grassland mainly, with some very extensive sheep and wool production.	-	Severe wind and sheet, scree and gully. Vulnerable to intense frost action where bare of vegetation.	1125-1875
(+ KAIKOURA HILL SOILS) (+ KAIKOURA SOILS)											
HURUNUI STEEPLAND (Lowland yellow brown earths)	Greywacke and weathered colluvium. Some patches of loess.	Fescue/silver tussock grassland with scrub and bush.	Steep with some moderately steep. (150-900m)		Medium	Very extensive to extensive sheep with some protective forestry.	½ 1	Extensive to semi-extensive sheep and cattle.	Very good response to: S+P+L+Mo	Sheet, particularly in bush.	675-1125
HURUNUI HILL (+ HURUNUI SOILS)	Greywacke and greywacke loess and weathered colluvium.	Silver/fescue tussock grassland with patches of broadleaved/podocarp forest in gullies; some flax and herd fern.	Moderately steep with some steep gullies. (Up to 900m)	Nutty, friable on blocky, stony, friable; and massive stony on shattered rock.	Medium	Extensive and semi-extensive sheep and cattle.	1 1½	Semi-extensive sheep and cattle.	Very good response to: S+P+L+Mo	Sheet and slips.	675-1125

DIFFERENCES BETWEEN SOIL CATEGORIES (A) AND (B)

The above mountain soils differ from the following downs soils in that they occupy topographical areas at a higher altitude; areas of steeper, broken topography and they tend to have shallower, stonier profiles. The production capacity of mountain soils compared to downs soils is lower, and, therefore, are used only in an extensive manner.

(B) DOWN SOILS											
KAKAHU SOILS (Yellow grey earths to yellow brown earths intergrade)	Greywacke loess and and greywacke and gravels.	Fescue tussock grassland.	Rolling ridges (150-550m)	Silt loams.	Low	Extensive sheep and supplementary feedcrops with semi-extensive sheep and supplementary feed crops.	2 2½	Semi-intensive sheep, cattle and supplementary feed crops.	Very good response to: S+P+Mo+L	Sheet.	750-1000
KAKAHU HILL SOILS	Thin greywacke loess and greywacke	Fescue tussock grassland; some snow and red tussock, manuka scrub and some broadleaved forest in gullies.	Moderately steep with some steep gullies (150-550m)	Mostly silt loams.	Low	Very extensive sheep to extensive sheep and cattle.	1 2	Extensive sheep and cattle to semi-intensive sheep and cattle.	Very good response to response to S + P + L + Mo	Sheet, gully and slips	750-1000

SOIL NAME AND SOIL GROUP	PARENT MATERIAL	NATIVE VEGETATION	TOPOGRAPHY	SOIL TYPE	NATURAL NUTRIENT STATUS	PRESENT USES	CARRYING CAPACITY (EWES/ACRE)		POTENTIAL USES	RESPONSE TO PASTURE TOPDRESSING	LIABILITY TO SOIL EROSION	RAINFALL p.a. (mm)
							PRESENT	POTENTIAL				

DIFFERENCES BETWEEN SOIL CATEGORIES (B) AND (C)

The above downs soils differ from the following terrace and bottom land soils in that they occupy the higher, rolling hill slopes and they have deeper topsoils and are less stony. They tend to have a lower nutrient status and so are less productive and, therefore, used less intensively.

C) TERRACE AND BOTTOM LAND SOILS												
MAYFIELD SOILS (Recent)	Greywacke alluvium.	Silver tussock grassland; few clumps of black beech forest.	Flat to gently undulating (300-450m)	Silt loams, some shallow or stony.	High	Semi-extensive sheep, cattle, supplementary feed crops and cash crops. Some semi-extensive sheep and supplementary feed crops.	2½	4	Intensive sheep and cattle, supplementary feed crops and cash crops, and market gardening.		Wind when cultivated	875-1125
WAIMAKARIRI SHALLOW SOILS (Recent)	Greywacke alluvium; some fine sandy loess and dune sand.	Silver/fescue tussock grassland and matagouri scrub.	Flat plains with some old stream courses; also few sand dunes near flood plains. (Up to 335m)	Sandy loams to silt loams, shallow and stony loams.	Medium to Low	Extensive sheep and supplementary feed crops and cash crops with extensive sheep and cattle.	1	2	Extensive sheep and cattle	Good response to S + P	Wind	500-875
HORORATA SOILS	Greywacke alluvium.	Fescue tussock grassland.	Flat to undulating terraces. (180-450m)	Mainly silt loams some stony silt loams or bouldery silt loams.	Medium	Extensive to semi-extensive sheep and supplementary feed crops.	2	3½	Semi-intensive sheep and cattle, supplementary feed crops and cash crops.	Very good response to combined applications of S + P + L + Mo	Slight wind	750-1000

ABBREVIATIONS: S = superphosphate; P = phosphate; L = Lime; M = Molybdenum;

*The information contained in this chart has been summarised from the New Zealand Soils Bulletin (27) : SOILS OF THE SOUTH ISLAND.

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- A. Family background, geneologies etc.
 - B.
 - B.2. Diaries
 - B.2. i)-xvi), xvii), xviii), xix)
 - B.3. Letterbooks
 - B.3. xvii) Correspondence
 - B.4. Notebooks
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 - F.4. i), ii), iv), v), xi)

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- H. House plans
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- I.1.
- I.3.
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