The Development of Communication Lines Across The Taranaki Uplands.

A Thesis Presented For The Degree of M.A. and Honours. in Geography

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Code Number 36
Fig. 1. This air photo shows the three elements of the topography of Taranaki.
In the background rises the cloud-capped, volcanic cone of Egmont (2,260').
Surrounding the peak and its ranges are the Taranaki Inlands with their patchwork
landscape. In the foreground lie the tangled ridges and narrow valleys of the
Taranaki Uplands. Striking examples of the mass movement of soil are innumerable.
Reversion of the deforested hills to scrub
and forest is evident. Many of the features
that have made the Uplands a persistent,
topographic barrier are portrayed.

(V.O. Browne photo)
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INTRODUCTION

A characteristic feature of the topography(1) of New Zealand is the presence of small, coastal plains, commonly separated from each other by upstanding areas of rugged relief. Since man first set foot on the islands, physical barriers have hindered the development of both communications and settlement. The Maoris were confronted with the difficulties of land travel between tribal centres. The establishment of the first European settlements and their maintenance, for many years, was possible only with the aid of sea communications. In the North Island, as settlers occupied the more favourable lowlands, the Maori tribes were forced to move into the surrounding pockets of rugged country. Thus, to the Europeans, land communication between their scattered settlements became a problem of a dual character. Not only was there the rigorous nature of the intervening, topographic barriers but also the antagonism of the Maori occupants who refused to surrender to an alien civilization.

Long before the middle of the nineteenth century, the work of inland exploration had begun, principally by missionaries. The nature of the country in both the North and South Islands, it is clear, prevented the success of a few, systematically planned expeditions. Exploration had to be carried on from many unconnected bases. The epic of exploration forms no single, coherent story but a complex, episodic chronicle. European settlements developed in virtual isolation from each other apart from irregular, sea connections. Local patriotism evolved from the unavoidable tendency towards independence and self-sufficiency. The removal of the isolation has been directly related to the development of modern communication lines which have provided land links of easy traverse between centres of growing population and increasing production. Yet, in spite of the national network of present roads and railways, a legacy of the

(1) The word "topography" as used throughout this thesis applies to landforms or surface configuration rather than to the details of the landscape of a small area - a meaning retained in Webster's Dictionary.
past has persisted. It is expressed in the distinct regional consciousness which is an acknowledged characteristic of present-day New Zealand.

In an attempt to portray and qualify these varied features, a local example has been studied. One of the earliest European settlements in New Zealand was that of the Wakefield colony of New Plymouth, founded on the northwest, coastal margin of the Taranaki lowlands. The lowlands, encircling the isolated volcanic peak of Mount Egmont, are enclosed, landwards, by a wide, north-east to south-east arc of low but extremely rugged uplands. To this region of ridge and valley topography has been given the general name of the Taranaki Uplands.\(^1\) During the early years of settlement, the ranges were regarded as an almost insuperable barrier to land communications, with the notable exception of the narrow, coastal corridor to Wanganui and the south. The most persistent effect of the topographic barrier has been in North Taranaki, in the long period of land isolation of New Plymouth from the Waikato basin and Auckland. Consequently, more attention has been given to this area.

The thesis is advanced that the Taranaki Uplands have long been a barrier to land communications and settlement; that their barrier character is due to the wide extent of the Uplands and to a unique combination of landform, climatic and vegetation features, rather than to their elevation above sea level. In addition to the physical obstacles, the development of the present communication pattern across the Uplands has been long delayed by economic, political and financial factors, external to the region itself. During the last two decades, the improvement of communications has

\(^1\) Alternatively known as the Western Uplands, the Taranaki Back-country or the Taranaki-Wanganui Hinterland.
occasioned a rapid extension of the hinterland of the city-port of New Plymouth, thus bringing about an inevitable conflict with the commercial interests of Wanganui and Wellington, Hamilton and Auckland. The Uplands effectively isolated the Taranaki lowlands during the early years of settlement and, although the barrier has now been penetrated, it is not entirely removed. It still remains, to hinder, obstruct and, in many other ways, to exasperate the carrier and traveller. Finally, it is suggested that the Taranaki Uplands remain a problem area for present and future settlement. This is due, not only to the limitations of the environment but, also, to the widespread and ill-advised actions of the European settlers during the past sixty years. The latter have played the dominant role in the production of the maimed and scarred landscapes that exist, today, over wide tracts of the Taranaki Uplands.
Fig. 2

Location
CHAPTER I. The Taranaki Uplands in relation to Settlement and Communication Lines.

A. The Expansion of Settlement from New Plymouth.

The settlement of New Plymouth or Taranaki was founded in 1841 by the Plymouth Company which, afterwards, was merged into the New Zealand Company. An experienced surveyor, F. A. Carrington chose the site for settlement at a point on the coast, two miles east of Moturoa. From this point to the mouth of the Waitara river, there is a narrow, prograded, coastal plain which extends half a mile inland to the ancient sea-cliffs, marking the edge of the Taranaki lowlands. The lowlands form an arc averaging ten miles in width and extend for fifty miles around the eastern base of the volcanic cone of Mount Egmont. They rise from one hundred feet near the northern coast, to over one thousand feet at Stratford whence they descend to the sea near Hawera. The original settlement was confined to the scrub and fern covered coastal plain. No attempt was made to penetrate the dense sub-tropical rainforest which clothed the lowlands.

On the morning of March 31st, 1841, the "William Bryan" a vessel of 312 tons landed the first Devon emigrants, as well as the livestock that had been brought from England. Tents were erected for the settlers on the beach but several whares which had been built to serve as a whaling centre, were available to the colonizers. The second shipload of settlers arrived in the "Amelia Thompson" on September 11th, 1841 but owing to the open nature of the roadstead, the unloading of additional food supplies was interrupted by a period of north-west winds and the vessel was forced to return to Port Nicholson. The insecurity of the roadstead for vessels supplying the colony was apparent. "I am exceedingly afraid these heavy winds so constantly recurring will do incalculable injury to the place. There is no disguising the fact that it is not at all fit for large vessels to come here until we have sufficient means for discharging them quickly; and even for small ones it is as bad as bad can be as nothing can be landed
at the place with the wind at all fresh, when blowing from the north-west even if a vessel can ride safely at anchor." (1)

The settlement languished for a period during which the number of immigrants was small and the replenishment of food supplies irregular. Ships would take no risks. At the first sign of wind they weighed anchor and stood out to sea. The high costs involved in the transhipment of goods were an important factor in retarding land settlement. The small landowners could not economically clear the forest as there was, in the early days of the colony, no market for timber. With increased settlement in Taranaki and a growing demand this became practicable. The only area on which the early immigrants could be immediately settled was the Waitara block which, being covered with a scrub vegetation, required less effort to clear and cultivate. Communication between the Waitara block and New Plymouth was primarily by sea but the bar of the Waitara river restricted entrance to vessels of small tonnage. Travellers by land encountered difficulties in crossing the numerous streams, chief of which was the Waiwaiho river - a side stream with a stony bed and subject to occasional floods.

On June 20th, 1842, the scrub lands on both sides of the Waitara river were offered for selection despite warning from the Maoris that the European settler must keep to the south side of the river. The conflict over rights of ownership heralded exasperating difficulties that were to lead to the Maori wars of the 1860's. The year, 1842, was equally important in that although the settlers were not perfectly satisfied with the harbourless site of the New Plymouth colony, they realised they had to work to maintain themselves. Devon and Cornwall families and relatives in England had responded to the call for aid from the pioneers of New Plymouth. The settlement began to show signs of progress. More dwellings were built to house the new ship-loads of immigrants from the south of England; two small flocks of sheep had been bred,

one of Merinos and the other of Southdowns; a bridle track had been opened around the eastern base of Mount Egmont through the forest to Patea, along which seventy head of cattle and large numbers of sheep were driven from Wellington to New Plymouth; the Waiwhakaho river was crossed by a primitive suspension bridge; and a small nucleus of shops and houses formed the township of New Plymouth.

The purchase of land continued despite unsolved questions of Maori rights of ownership. The soil, once under cultivation, proved productive. "The very large yield of the grain-crop and the promising appearance of the potatoes have inspired confidence and good feeling among the settlers."(1) Indeed, in 1845, barely four years after the initial settlement, farm production was in excess of local demand. Trade was begun with Nelson and Wellington. Settlement expanded inland and spread around the coast of Cape Egmont. In 1847, the Omata block was purchased from the natives. The demand for land necessitated extensive clearing of the forest from the lowlands. The forest was felled during the winter and, after being allowed to dry for six months, was burnt and a thin sowing of wheat made among the ashes. Seffern records that the returns from the first harvest were excellent. "A crop of fifty bushels to the acre was pretty sure."(2) Restoration of confidence among the settlers encouraged increased cultivation of land. The growing volume of trade brought into the settlement more capital for the clearing and cropping of the new land.

In 1851, the New Zealand Company resigned its functions, and their various settlements, including Taranaki, were sold to the Crown. Progress was stimulated with the removal of the Company's restrictions on land development. The publication of the first newspaper, the Taranaki Herald, in 1852 provided a valuable means of criticism and of moulding the unorganised settlers into a pro-

(1) Seffern: op. cit. p. 131
gressive community. The district of Taranaki at this time was a small and compact area, totalling two and a half million acres, of which less than ninety thousand were in the possession of Europeans. (1) The village capital of New Plymouth nestled on the coastal plain between the cliffed edge of the lowlands to the south-east and the sea in the north-west. Outliers of settlement had been established at Bell Block, Tataraimaka and Omata. The final episode of the foundation period of the colony was the enforcement of the new Constitution Act in 1853. Until this act, Taranaki was virtually without a Government. Auckland was the dominant centre of population and administration. In their isolation other districts were independent states, managing their affairs as best suited local conditions.

The next ten years witnessed a deterioration in the relations between Maori and European. The Maori Land League bound its members "to sell no land to the European settler and to prohibit by force, if necessary, others from selling." Conflict over land ownership led to open warfare in 1860 and, for a decade, the settler had to take up a rifle and lay down the axe. Land development was arrested. Years of work were rendered useless. With the accession to office of the Fox-Vogel ministry in 1869, peace was proclaimed by the Native Minister, Sir Donald Maclean. A fresh start was made by the settlers on their neglected farms. With the exception of a passive resistance offered by Te Whiti and his followers in 1880(2) no further disturbances occurred in the district. However, peace did not restore complete confidence among the settlers. Dense forest, traversed only by bridle paths, still enclosed the settlement from the north-east to the south-west. Within it dwelt remnants of the many Maori tribes ejected from the coast, after the sale of land to the Europeans. Danger continued to threaten settlers who ventured off the beaten tracks.

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(1) B. Wells: History of Taranaki; New Plymouth, 1878.

(2) The Maoris ploughed up settlers' lands as a protest against their acquisition by Europeans.
The only means of communication, secure from attack, was by sea but the open nature of the roadstead restricted its usefulness. A steamer called once or twice a week but remained only as long as was required to put off and take on cargoes. Business was meagre. The population of the province in 1870 was approximately 4,350.\(^{(1)}\) The economic and political power of Taranaki, relative to New Zealand as a whole, had languished due to the Maori Wars and the small population. In contrast, the rapidly increasing numbers of the South Island provinces, untroubled by the Maori problem, had attained wide political powers and made great material progress.

The "peace policy" of Sir Donald Maclean resulted in more amicable relations between Maori and European. Between 1872 and 1874, an area of 377,470 acres of land for settlement was purchased by the Provincial Council.\(^{(2)}\) The development of rail and coach connection between Manganui and New Plymouth during the 1870s was accompanied by an extension of settlement over the forested lowlands, along the line of communication. It was during these years that settlements, such as Inglewood, on the rail and road route were surveyed and settled. The immediate isolation of New Plymouth from outside centres was removed. During the 1880s, construction was begun on the concrete blockwork breakwater which was to supersede the open roadstead.

The new influence had important effects on farming. The fungus trade with China developed during the period. In 1885, it returned, to the farmer, more in money than butter. It was invaluable to him because he received cash for the fungus, whereas butter was sold on a system of exchange and barter. With the successful advent of refrigeration in 1882, farming in countries distant from world markets, like Australia and New Zealand, was transformed. Its general application after 1890 and the economic transportation of frozen meat and butter to European markets led to a tremendous boom in land settlement. Taranaki was the first

\(^{(1)}\) Selfern: op. cit. p. 197

\(^{(2)}\) Ibid: p. 204
Fig. 3
Distribution of Population 1896
part of New Zealand to show a spectacular advance as a result of refrigeration. Extensive areas of native forest on the lowlands were milled or burnt and converted into pastures of English grasses; dairy farming became the mainstay of the economy of the province. New roads were constructed and old ones improved; rivers were bridged. It was during these years of economic prosperity that most of the Taranaki lowlands were occupied. Pioneers began to reach the borders of the Taranaki Uplands.

B. The Expansion of Settlement from Auckland.

Radiating from the centre of Auckland, on the Waitemata harbour, settlement spread southwards through the Waikato river basin. After 1863, the expansion was encouraged by the construction of the northern sections of the Main Trunk railway. The line originated to supply the needs of efficient military transport during the Maori Wars. After 1870, it was motivated by the public works policy with which Julius Vogel had electrified the House of Representatives on the night of June 28th, 1870. The railway construction boom which followed the inauguration of Vogel's policy of assisted immigration and energetic construction of public works, provided the impetus under which the line was carried to the King Country. By 1883 the railhead had reached Te Amanu on the northern border.

The northern border of the King Country corresponds with the "aokati", a line beyond which the European settler was forbidden to trespass. The frontier for white settlement lay along the confiscation line as defined in 1864. It ran from the sea at Aotea harbour, through the summit of Pirongia to the junction of the Puniu and Waipa rivers, thence along the Puniu river to its source whence it lay in a northerly direction to the Firth of Thames. The area south of the line became known as the King Country or "Roho Potae". It reached the shore of Lake Taupo in the east; the junction of the Whanganui and Wanganui rivers in the south and followed the Taranaki confiscation line from the source
of the Whanganuomone river to the sea at the White Cliffs. (Fig. 7)
The entire area was closed to the white man until 1833. Early
surveyors searching for possible routes for the Main Trunk railway
had been opposed with force by the Maoris. The general amnesty
of 1833 brought Te Kooti and his natives out from their retreat
in the upper Waipa valley. Mutual agreement between Maori and
European allowed the railway construction to proceed to Te Kuiti.
The section was opened in 1887. Direct rail communication became
possible between Auckland and Te Kuiti - a distance of 126 miles.

Te Kuiti township is situated at the head of the Waipa valley
lowland which presented few topographic difficulties to the railway
engineers. The easy grades of the Waikato and Waipa valleys aided
rapid and cheap construction, after the Maori opposition was over-
come. Te Kuiti, however, marks the limit of the lowlands. Here
begins the broken topography of the Taranaki Uplands which extend
for over seventy miles to Urenui, at the northern limit of the
taranaki lowlands. By 1885 the Wellington - New Plymouth railway
was completed and reliable means of communication established.
Te Kuiti, in relation to Auckland, was in a comparable position.
However, separating Te Kuiti and New Plymouth was the formidable
barrier of the Taranaki Uplands. The only effective means of
communication between New Plymouth and Auckland were by sea.

The New Plymouth to Auckland sea service suffered from two
fundamental disadvantages, owing to the nature of the harbour term-
inals. No natural harbour existed at New Plymouth. The roadstead,
in the lee of the volcanic projection of Moturua, was open to
strong winter winds and, especially, to the boisterous north-westerlies.
This unsatisfactory position was rectified by the construction of
the breakwater, behind which relatively safe anchorage was possible
for coastal vessels of up to 500 tons. It required many years of
labour and the investment of large sums of money before a direct
overseas shipping service was begun in 1917.

The second fundamental disadvantage is common to all river
mouths and harbours on the west coast of New Zealand. A sand-bar,
built up and maintained by the northerly sea drift along the coast,
lies across the entrance to Manukau harbour and prevents access
Fig. 4. The narrow coastal plain between the coastline and the ancient sea cliffs formed the site of the original settlement of New Plymouth. Today the city has spread over the plain and up onto the Taranaki lowlands proper.

Fig. 5. Te Kuiti, at the head of the Waiapu valley lowland, is today an important communications centre on the border of the Uplands.

Fig. 6. A typical view of the extensive area of rugged relief between New Plymouth and Te Kuiti. With the clearing of the forest, the fine river dissection, narrow valleys, interlocking spurs and steep ridges stand out sharply.
into sheltered water during rough weather. However, there was no alternative means of travel between Auckland and New Plymouth capable of competition, until the opening of the Main Trunk railway in 1908. After the completion of the Wellington-New Plymouth railway in 1885, virtually all of the traffic between Auckland and Wellington passed through New Plymouth.

The unsatisfactory nature of the sea communications forced Taranaki and Auckland interests to seek a land route which would provide rapid and reliable means of transport. The Main Trunk railway commission of 1882 supported popular opinion in suggesting possible routes from the Auckland Province through Taranaki. However the practical difficulties were formidable. The areal extent of the Taranaki Uplands, combined with their physical character presented an effective barrier to communications and settlement. The Uplands, extending from Te Kuiti in the north to Urenui in the south, reach the western edge of the volcanic plateau at the foot of the Ruapehu mountain complex. A line joining Mangapori and Tahepa marks the approximate south-eastern limit. (Fig. 7) The boundaries enclose an area of more than 5,000 square miles, including five counties as well as major portions of six others.

C. The Physical Geography of the Taranaki Uplands.

Henderson and Ongley have outlined the physiographic history of the area along the following lines. (1) Towards the close of the Tertiary era, the region formed part of the floor of a shallow sea, to the east of which arose low-lying land. During the period, marine beds, consisting in the main of mudstones, sandstones and sandy limestones, were laid down. Sections of the Mokau, Pataua and Whanganui rivers and along the coast of the North and South Taranaki Bluffs show that the area was raised with remarkably little deformation of strata. At first the land was higher than at present but later was depressed. Land movements continued to take place, by small uplifts or depressions. Intervening periods of quiescence allowed wave erosion to form coastal terraces at various

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(1) Henderson and Ongley: "Geology of the Mokau Subdivision"; N.Z. Geological Survey Bulletin, No. 24, pp. 6...
heights, of which the 100 foot one is most complete today. This
terrace is of especial importance for communication lines. Assoc-
ated with the earth movements which raised the Tertiary sea bottom,
was faulting, which, in the northern interior, was on a large scale.
The Chure fault, with a well marked north-east strike, forms the
western edge of a wide depression extending south from Te Kuiti.
The Chure river, a tributary of the Mangamia river, follows the
line of strike for part of its course, showing a close adjustment
to structure. The depression forms a major physiographic unit,
separating the eastern uplands from the coastal ranges to the west.
The accordant summits of the ridges are evidently the rem-
nants of a land of low relief. Grange(1) believes the old surface
to have been a peneplain, formed at a time when the sea stood a
little more than 700 feet above its present level. The raised
peneplain, consisting of weak rock, was rapidly attacked by wind,
water and frost. The uniform softness of the plateau favoured
the rapid entrenchment of the original marine rivers of the pene-
plain. Headward erosion by innumerable streams in virtually
homogeneous rock has developed an intricate river pattern. (Fig.6)
Changes in elevation were responsible for the formation of the pre-
sent estuaries of the North Taranaki rivers which are well graded
for many miles inland. One of the largest of these rivers, the
Nokau, is tidal for a distance of twenty four miles from its mouth
and has permitted navigation to coalfields. The development of
a "sediment drainage"(2) pattern, with associated intense "drainage
relief"(2) has given a mountainous appearance to the area although
the ranges are of relatively low altitude. At the coast they are
only 700 feet high but rise, gradually, to 2000 feet along the
central divide between the upper Taranui and Waitara river valleys.
They attain a maximum height of 3000 feet, about fifty miles inland
where they merge into the central volcanic plateau. (Fig.10)
The incised rivers, in their meandering valleys, wander irregularly
through the plateau. The steep, symmetrical ridges which separate

(1) Grange: "Geology of the Tongaporutu-Chure Subdivision":
(2) Developed by consequent drainage in areas of homogeneous rock
and likened to the branching of an apple tree.
(2) Height from valley floors to ridge-tops.
Fig. 8

RIVER PATTERN
Fig. 9. This vertical air photo of Whanganui township and the surrounding area illustrates the fine dissection of the region by insequent streams. Ridges in close proximity separate narrow valleys. The darker patches are either scrub or secondary forest whose growth is healing the scars of mass movement of soil. Little use is now made of the ridges. Running across the photo are the valley-guided inland road and railway.

(N.Z. Aerial Mapping photo)
Fig. 10
Relief
the valleys, rise 200 to 1,000 feet above the valley floor. Average slopes are steep, often 25-30°. In combination, these factors make travel on foot exceedingly slow and laborious. "In half a mile we rose 200 feet -- - this is scarcely pleasure, climbing grades of 1 in 1 with a swag on your back -- - . We at length attained the summit and then undid all our work by going down the other side. It took us four hours to surmount this ridge."

But another factor accentuated the barrier effect of these Uplands to the settlers, in their search for a northern outlet to the To Kuiti railhead. This was the character of the vegetation.

Before the advent of European settlement, nearly the entire Taranaki Province was clothed in an evergreen, subtropical, rain forest developed in the conditions of a predominantly super-humid, microthermal, climate (classified as an AC's type, according to the Thornthwaite system(2)). Ample sunshine, a high number of rainy days characterized by periods of two, three or four days of heavy rainfall, these factors combine with topography, soil and drainage, to favour a mixed forest in which tawa (Phyllocladus tawa) is, generally, the dominant forest tree.(2) The character of the forest varies with relief. On the small alluvial flats between the hill-slopes, kahikatea (Dacrycarpus dacrydioides) and rimu (Dorycnium cupressinum) predominate. Further up the slopes, tawa enters, in association with matai (Podocarpus spicatus) and rauru (Glen Cunninghamia). Slightly higher up, almost pure stands of tawa are common. Within the forest, the floor is covered with terrestrial ferns. Higher still, kawahi (Tetramena ramosa), rata (Hetrosideros robusta) and totara (Podocarpus totara) inter-mingle with tawa while on the driest ridges of low soil fertility, tawa almost disappears and black beech (Nothofagus Solandri) replaces it. The foregoing is strictly an account of the ancient-

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or primary forest. When it is cleared, "secondary scrub", in which manuka (*Leptospermum scoparium*), water-fern (*Nisttederis incisa*) and bracken-fern (*Pteridium aquilinum*) are predominant, quickly covers the area. This, in turn, given way to the small tree association of the "secondary forest". E. Bruce Levy, who has traced, in detail, the life-cycle of the forest of the Taranaki Uplands, summarises the position. "Where then, we find in natural vegetation, as in our grasslands, that there is succession - that is, to say, there is a series of plant communities, one type by its growth preparing the way for the next which then established will replace its foster parent - - until finally there arises an association which ceases to change."

It was this climax association, described above, which covered most of the Taranaki Uplands in 1890.

The early settlers and explorers who ventured into the Uplands, returned with unfavourable impressions. From the lowlands, the barrier appeared to be simple ranges of low hills. Elevation above sea level was not, however, the significant factor in the topography. Indeed, when analysed separately, the physical obstacles do not, at first sight, appear impressive but, in combination, they are formidable. The explorer found an extensive area with a marked similarity of physical character. The mere extent of the region was an obstacle. Tracks were few and to follow a river valley meant an extremely circuitous journey. The traveller was obliged to climb from one river valley into another, over relentless ridges, rising steeply 600 to 800 feet above the narrow, alluvial, valley floors. Dense forest hindered progress. Where tracks existed, they were, frequently, little more than canals of slush. The long periods of heavy, warm, frontal rain gave no respite. Rivers flooded rapidly and the narrow, gutter-like valleys became swollen torrents. Mist enveloped the valleys at night and, in winter, often persisted until midday. The noise of mass movements of acres of hillsides, after heavy rain, sounded like thunder. During the summer, placid streams, meandering peacefully through luxuriant forest, betrayed the true character. Yet, even during these months, for short periods

(1) E. B. Levy; *op. cit.* p. 142.
of heavy rainfall, the countryside was as inhospitable as in winter. Slush and slips with wet weather, inescapable forest, floods and fogs, imnumerable razorback ridges and rivers formed the characteristic and repeating pattern. Paradoxically, the pioneers never ceased to be attracted to the Uplands, attracted because here was a battleground where conflict between man and nature was always in the air.

The first routeway developed across the region was along the natural corridor that exists through the forested and rugged Uplands. This is the low coastal terrace along the South Taranaki Bight. Between Hawera and Manganui, the average width is three miles and it provides a relatively easy route for communications to the Manawatu plain. The railway, laid along the coastal terrace, linked Wellington with New Plymouth in 1885 but the route did not provide a means of direct connection with Te Kuiti and Auckland. The Manganui river was a potential routeway to the interior of north-east Taranaki but this area remained closed to the European settler, until the completion of the Main Trunk railway after the turn of the century. Moreover, the upper limit of river navigation, by canoe, is at the junction of the Ongarue and Manganui rivers, the present site of Tumarunui. In order to reach Te Kuiti, there still remained the problem of crossing a wide portion of the Uplands. The coastal terrace along the South Taranaki Bight has no counterpart, as complete in extent, along the North Taranaki Bight. The Taranaki lowlands, cliffs to a height of 100 feet, extend northwards along the coast, decreasing in width until they disappear at Pukearuhe where the Messenger range meets the sea to form the White Cliffs. (1)

For a distance of three miles northwards, there is no terrace. At full tide, the sea reaches the base of the 300 foot cliffs while three miles inland, Mount Messenger, the summit of the range, is only 1,008 feet in height. To the north of the range, the coastal terrace, averaging twenty chains in width, provides a narrow routeway. It is backed inland by steep hills which have, evidently, been carved from the ancient sea-cliff. The present

(1) The popular name is derived from the glistening appearance of the whitish formation. Known by the Maoris as Parimihini.
Fig. 11. The intense drainage relief and razorback nature of the ridges is well illustrated by this view of the catchment divide between the Kokau-iti and Ohura rivers. The altitude is only about 2,000'.

Two views of the accordant summits which are evidently the remnants of a land of low relief.

Fig. 12. A view near Tokirima looking east.

Fig. 13. A view near Douglas looking north.
Fig. 14. The tidal estuary of the Awakino river at the limit of the coastal terrace.

Fig. 15. The Tongaporutu river four miles from its mouth at full tide. The fertile alluvium supports rich pastures but is liable to extensive flooding. Note the scrub-covered hills rising steeply from the flat valley floor.

Fig. 16. The narrow coastal terrace between Tongaporutu and Kowakatino backed by steep cliffs cut out by the sea at an earlier period.
Fig. 17. A forest remnant near Waitaanga still largely in its primitive state. Altitude approximately 1,500'.

Fig. 18. The Upper Mokau river in flood in the 1920's. Much of the valley is still under the original forest.

Fig. 19. The secondary scrub stage of succession back to forest after clearing. Manuka clumps and bracken fern predominate and have begun to stabilise the soil.
coast is formed of steep cliffs, 30 to 100 feet high. The terrace extends to a point, three miles north of the Awakino river mouth where, once again, wave-out cliffs of the Herangi Range reaching a height of 400 feet, rise from the sea.

In addition to the limitations of a rugged terrain, the region, as a whole, is singularly deficient in suitable road and railway building materials. The blue-greyish, consolidated mudstone, locally known as "papa"—covers nearly the entire area. Only in locally restricted areas are suitable materials available for roadmaking. Between Te Kuiti and Awakino, limestone is common and, between New Plymouth and Urenui, there are andesitic lavas. In the intervening area, there occur only small and scattered deposits of shelly formations. Bearth of suitable materials, especially for roads, was a contributory factor in the slow development of an all-weather outlet to the north. "Papa" surfaced roads cut up rapidly in wet weather, becoming treacherous quarries which developed into a series of deep wheel-tracks during summer. The mass movement of hillside soil, even under the protective forest cover, added to the difficulties of the construction of communication lines.

Such was the nature of the topographic barrier that confronted settlers seeking an effective land connection with Te Kuiti and Auckland. The possibility of constructing an easier land route, avoiding the Whanganui range, was soon found to be remote. Indeed, the greater width of the Uplands presented more serious difficulties than were to be found along the coast. The only convenient land route was along the sea beach, from Puheke to the mouth of the Tongaporutu river, that is, at the base of the White Cliffs. This could only be negotiated between low and half tide. Thus it is little wonder that these Uplands presented an effective barrier to land communications and, consequently, to settlement. In 1890, they isolated New Plymouth.

Nearly one hundred years elapsed between the original settlement of New Plymouth and the effective removal of its isolation, by the construction of all-weather communication lines across the Taranaki Uplands. The principal route is that followed by the coastal road
between New Plymouth and Te Kuiti, over the Messenger range.
This highway, with that along the south coast to Manganui and
the Manawatu plains, provide the most important routeways. An
inland road, constructed from Stratford to Chuna, thence to Taurarumui and Te Kuiti, is closed, as a through route, during the winter.
Motor communication between New Plymouth and the important centres of
the southern King Country, is by means of the coastal road to the
northern side of Mount Messenger thence an all-weather road traverses
the north-south divide between the catchments of the Waitara and
Manganui rivers. The route is of recent construction as an all-
weather road but it will be an important factor in the future ex-
tension of the hinterland of the overseas port of New Plymouth.
The railway connection with the Main Trunk Line, to a point near
Tamarumui, parallels the inland road for considerable distances.
Until the improvement of the roads, it provided the sole means of
transportation from the southern King Country to the nearest over-
seas port, at New Plymouth. Although the monopoly no longer exists,
the railway remains an important communication line.

The present communication pattern is, to a large extent, the
product of the post-Great War period when the automobile became the
popular means of travel. The demands of modern transport have re-
sulted in the removal of the barrier effect to communications of the
Taranaki Uplands. To realise the implications of this in the geo-
graphy of Taranaki, it is necessary to outline the historico-geographic
development of the communication lines that, today, cross the Taranaki
Uplands.
CHAPTER II.
The Development of Communication Lines across the Taranaki Uplands until 1908.

The earliest land communications between the upper Whaipoota valley and the Taranaki lowlands, were those developed by the Maoris. They had no vehicles or animals, except the dog, and they possessed no sharp-edged tools with which to clear wide tracks through the dense undergrowth. Their method of trackmaking was simple but painstaking. One man who knew the direction of the objective, proceeded in advance of the main party. The leader selected a line where the vegetation appeared to offer the least resistance. With his hands, he broke the smaller bushes, always bending their heads in the direction of travel. Others, following in his tracks, repeated the same operation. The whole party, working in this manner, formed a well-defined trail. The summit of a ridge was generally preferred, as it avoided streams and swamps, and the vegetation was generally thinner. Moreover, it was often possible to obtain a wide view of the lay of the land, and wherever this occurred, the undergrowth was beaten down to allow an uninterrupted panorama. Along the trails, formed in this manner, the Maoris travelled in single file.

Traversing the Taranaki Uplands there was one principal route which the Waikato tribes used as a war-trail, during their frequent incursions against the Taranaki Maoris. (Fig. 20) The route followed the coast from New Plymouth whence it continued south to Cook Strait. Advantage was taken of every stretch of beach that existed but in the more thickly populated parts, it ran inland, from "pa" to "pa" or village to village but, from the physical nature of the country, never very far from the coast. From the New Plymouth harbour, south to the Makau river, the coast was generally precipitous, with undulating or broken country stretching inland and covered with light scrub, for a mile or more, to the edge of the forest. Where the sea did not reach the base of the cliffs, the beaches were used but it was an arduous trail because of the constant ascent and descent of the steep cliffs. The area was apparently never
very thickly inhabited, although there were several well-known "pas" and settlements, notably at Marokopa river, Waitakau and the Awakino river. The Mokau river was the site of a considerable population. Several branches of the Ngati-Maniapoto tribe lived near its mouth and up the river valley. The next twelve miles to the Pukearuhe "pa", near the southern end of the White Cliffs, formed an effective barrier of steep ravines and forest-clad ranges, apart from the narrow strip of beach at the base of the cliffs. From Mokau to the Katikati-aka "pa", at the northern end of the White Cliffs, the trail traversed the 100 foot coastal terrace which was covered with a light scrub vegetation, for a quarter of a mile inland, to the edge of the forested, coastal hills. This open stretch of land possesses a fertile soil and, at one time, must have been intensely cultivated by the Maoris, in order to support the large population that dwelt in the numerous hill-forts, still to be seen situated on every vantage point. At Katikati-aka "pa", the trail descended, abruptly, to the beach, passage being by means of wooden stakes driven into the cliff-faces, to which ropes were attached. The Maori trail proceeded southwards, for three miles, along the narrow stretch of sandy beach which was uncovered at low tide. Immediately the cliffs were passed, the trail wound up the slopes of the Pukearuhe plateau to the "pa", strategically situated at this important communication point. South of the White Cliffs commences the undulating country which forms the present rich dairying lands of Taranaki. Broken ranges of no great height rise in the east. The undulating country gradually increases in width from its commencement at Pukearuhe, until, at Waitara, it is four or five miles wide. The coastline between these two points is generally lined with perpendicular cliffs, gradually declining in height from 100 feet, until, in the neighbourhood of the Waitara river, the coastline is low with occasional sandhills. Southwards from Urenui, the country opens out, sloping gently up to Mount Egmont. It was open farm land for a width of two to four miles, in 1860, with many wooded gullies advancing towards the sea. The coast from Waitara to Moturoa is low and the country, as usual, is intersected with many entrenched streams. The fertility of the soil was appreciated by the Maoris, is evidenced by the number of old "pas" and kumara pits scattered along the coast,
Fig. 20

MAORI TRAILS
Fig. 21. A vertical air photo of the White Cliffs taken at half tide showing the narrow beach exposed. Here the Kessenger range meets the sea in 900' cliffs. The absence of the coastal terrace made this range a critical point for land travel. Even today, at low tide, the beach is used as a stock route. The terrace can be seen reappearing at the top of the photo. Forest still largely in its primitive state.

(N.Z. Aerial Mapping photo)
particularlly near Ureneru.

The Maoris confined their activities to the low, fern-covered plain. The inland, forested ranges were a barrier which was only penetrated in search of food but never permanently occupied. Likewise, it was an effective barrier against incursions by hostile tribes. A few Maori paths led through the Uplands and connected scattered villages with the populated coast. (Fig. 20). The Mokau river was navigable, for canoes, upstream to the open country near Totoro where the Tapu-i-wahine trail branched southwards, up the Mokau-iti river and across the Tapu-i-wahine ranges which form the divide between the catchments of the headwaters of the Mokau-iti and Ohura rivers. The trail continued across the upper waters of the Ohura river to Kawakawa, following the Taringamatu river and the Tuhua ranges to the southern shore of Lake Taupo. A branch of the trail lay along, but not in, the valley of the Waikaka river to Mihoniho, on the Ohura river whence it travelled south-eastwards to connect with the Tapu-i-wahine trail. A second inland trail, the Tihi-manuka, ran from the coast at Katikatitake "pa", along forested ranges to the Tangaraka gorge, near the modern Ohura road route; across ranges and river valleys to the Wanganui river at Koiro; thence along the river bank to the present site of Tawareunui. A third west-east trail across the Uplands to the Upper Wanganui river was the Taumata-maho track, which, beginning at Onaero on the coast, followed the Ureneru river to the Taramouka stream, a tributary of the Waitara river. Here, it was joined by another trail from the coast following the north bank of the Waitara river. The combined Maori trail continued inland across the Waitara river at Purangi; climbed the dividing range and descended into a tributary of the Patea river whence it ran, in an easterly direction, into the valley of the Wanganui river.

These three routes were the only ones affording means of access between the sea coast and the interior. The Maoris used them mainly as a means of refuge. Long distance movement of goods, except those of very high value, played little part in the Maori economy of Taranaki.

The Patea river valley and the Wanganui river provided two routeways into the interior from the South Taranaki coast. The potential value of the Maori trails for European use was pointed out and suggested, as
early as 1869. "Native tracks as a rule follow the best lines of the
country but are generally capable of being improved in detail. Inasmuch as bridges are rarely thought of by the natives, considerable
detours are often made to avoid a stream which might be covered with
the exercise of a moderate amount of mechanical ingenuity. Swamps
too are wound around which might be made passable by a small amount of
work in draining." (1) Along the lines of the trails, many secondary
roads have been laid, connecting the main through routes. The important
Maori trail along the coast corresponds, closely, with the present
route followed by the main coast road between Te Kuiti and New Plymouth.
Above all, the trails proved indispensable to early surveyors and explora-

Unfortunately the Maoris, having no vehicles or draught animals,
formed only narrow tracks which were useless as a means of servicing
the settlement of New Plymouth. From 1841 to 1890, virtually all
European trade was by sea. Sea communication with Wellington declined
early, with the development of the easy land route along the coast of
the South Taranaki Bight. Cobb's coach provided the first regular
road connection between Mangarui and New Plymouth, early in 1871.
Thereafter, sea traffic between New Plymouth and the south diminished.
The opening of the Wellington-New Plymouth railway, in 1885, completed
the diversion of trade from sea to land. In contrast, sea trade with
Auckland increased because New Plymouth became the transhipment centre
for the rail and sea through route of North Island trade. The river
port of Waitara commanded a considerable share of both inward and out-
ward shipping. Regular services were in operation to Onehunga,
Regian and Kawhitu while Hokau and Avakino were largely supplied by sea.
The construction of the artificial harbour at New Plymouth concentrated
sea traffic through the new port.

The year 1890 marks the peak period of the coastal sea service.
The completion of the Main Trunk railway, in 1908, led to a rapid decline
in the coastal trade. Reduction of travelling time between Auckland

(1) J. Cowan: Sir Donald Maclean: Wellington, 1940.
Fig. 22. Coastal shipping was vital in the early years of the settlement of New Plymouth. Here pictured is one of the coastal vessels which supplied the North Taranaki settlements such as Mokau, Tongaporutu and Awakino, tied up at the river port of Waitara. The opening of the main north road for all-weather traffic in the late twenties brought an end to this service.

(Mrs. L. Tate photo)
and Wellington to eighteen hours, instead of two days, meant cheaper freights while the prospect of trading with the new settlements along the railway helped to divert traffic from the sea to the land. The clearance and maintenance of a channel through the bar at the entrance to the Manukau harbour was too great a task to be economical. However, lack of other means of transport necessitated the continuation of the sea service with the North Taranaki coastal settlements. It was not until the economies of the motor age occasioned an all-weather, coastal road that the sea service was abandoned. Difficulties, associated principally with the physical nature of the country, presented such a road until the late 1920's. The significance of the sea, during the years before 1890, cannot be exaggerated. Despite its fundamental role in the early progress of Taranaki, it could not compete with the rapid and reliable services which the rail and road were to provide.

The years between 1890 and the opening of the Main Trunk railway were those of transition in means of transport; coastal sea communication reached its maximum development and began to decline; the survey of land routes across the Taranaki Uplands was inaugurated; a beginning was made on the construction of the coastal road and the inland road and railway. The principal feature of the period, however, was the completion of the Main Trunk railway with the construction of the Te Kuiti to Marton section.

Te Kuiti is 120 miles, in a direct line, from Marton across the eastern Taranaki Uplands. Although the railway had reached Te Kuiti by 1887, twenty one years elapsed before the line was completed. It was the idea of a Main Trunk railway to link Auckland and Wellington and the conviction that without such a link the North Island could never begin to realise its potentialities, that drove the railway construction on in the face of financial difficulties, a twenty year old native question, the deepest economic depression the country had yet known and a succession of engineering problems unequalled on any other line in the country. With an unsolved native problem and a central upland block which must be crossed, the choice of a route for the line was a far more difficult task than that of the South Island Main Trunk
railway. The question of alternative routes was raised again and again, as each important section was nearing completion. A report, written in 1872, discussed three possible terminals after the line left Ngāruawāhia.(1) The railhead finally decided upon was at Kihikihi, two miles south of Te Awamutu. The opening of the section, in 1880, once again raised the problem of alternative routes. Bearing in mind the future connection with Wellington, the central and more direct route, west of Lake Taupo, was regarded as the obvious choice. (Fig.23) One alternative was to head westward, to the growing settlement of New Plymouth and thus utilise the railway already constructed between New Plymouth and Wellington. The suggested route along the coast from Awakino to Waitara was abandoned early because of two main factors; the nature of the country which was some of the worst that had been surveyed at that time and the fact that being a coastal route it could only open up land on one side of the railway. A more favoured route through Taranaki was via Chura to Stratford. A complete alternative was to avoid the King Country and its native problem altogether, by carrying the line east of Taupo to the Manawatu river.(2) The main purpose of the railway under Vogel's public works policy was to open the interior for settlement. It was desirable that the railway should give access to fertile areas, especially, if in so doing, it could avoid the upland block. The preliminary survey of the three routes, in 1882, disclosed several important facts. In neither the eastern nor the Taranaki route was there much difficulty with the Maoris. The nature of the topography presented the greatest obstacle; in the case of the eastern route, the barren pumice region of the Kaingaroa plains offered little to prospective settlers at that time. The full survey of the central route was done by John Rochfort, despite Maori interference during his exploration through the heart of the King Country. The work was completed in 1884, after ten months of exploration in which razorback ridges, steep ravines and miles of trackless forest had required as great a fortitude as the rifles of threatening Maoris.

(1) Appendix to Journals of the House of Representatives; 1872, D5: p.5
Fig. 23

Rail Routes
From the viewpoint of settlement, the central route was most favoured as far south as the Hokau river. Approximately 80% of the land was classified as ploughable, though, at that time, it was open fern country with clumps of kahikatea (Podocarpus dacrydioides) in the valleys.\(^{(1)}\) As a result of the investigations, the central route was adopted, with the belief that it would give access to the greatest area of land suitable for settlement and followed the least costly line across the upland block.

The rate of construction varied considerably. The first twenty six miles to Te Kuiti were finished in two years; in the next two years, only a third of that distance was covered. Topographic difficulties played a large part in the retardation. As far as Te Kuiti, the line followed the valley of the Waipa river. With the penetration of the Uplands, steeper grades, high viaducts, sharp curves and long tunnels presented greater engineering problems. Moreover a large part of the work was done during the depression years of the late eighteen eighties and early nineteen nineties when finance was not readily forthcoming. The rising price level, after 1895, alleviated the difficulty. Thereafter, until the completion of the line, the retarding factor was the rugged relief. The Raurimu spiral exemplifies the remarkable engineering feats occasioned by the difficult terrain. The railway climbs 2,160 feet from the river side at Taumarunui Flat to National Park Station on the Waimarino plain. The line runs in an ascending spiral, a complete circle and two loops with two tunnels. (Fig.24)

The railway was the key factor in the opening up and development of the King Country. Thousands of acres were made accessible for pastoral settlement; timber milling and allied industries became the main feature of the King Country's economy. The clearing of the forest from the alluvial river flats and gentle slopes was quickly followed by the surface sowing of grasses on the slopes and the ploughing of the valley plains. Present towns, such as Taumarunui and Raurimu, were originally railhead towns, from which settlement expanded as the forest was cleared. Sheep farming, in association with the fattening of cattle for the Auckland Freezing Works, became the major farming industry.

\(^{(1)}\) A. to J.: 1884, DS: p. 75.
Fig. 24. An oblique air photo of the Raurimu Spiral on the Main Trunk railway. From the Raurimu Station (centre) to the point where it leaves the photo, the railway rises 240 feet and passes through two tunnels.

(V.C. Browne photo)
Dairy farming was limited to the small, alluvial, river flats. Settlement in the Ohura district was also pioneered during these years but it was handicapped by twenty miles of unmetalled road which separated it from the railway. The road was impassable during the winter months, a factor which prevented rapid development on a parallel with other Main Trunk settlements. The inaccessibility of the area was responsible for the commencement of a railway line from Okahukura, on the Main Trunk, to Ohura in 1911. The district developed a community of interest with the overseas port of Auckland, not only because it gave the easiest and cheapest means of communication but Auckland capital and organisations had nurtured the settlers. As regards actual distance, the Ohura area, including Taumarunui, was closer to New Plymouth but between them stretched the topographic barrier of the Uplands. The distance to New Plymouth is less than a third of that to Auckland and yet, the trade of the Ohura area was with Auckland firms. The barrier to the south-west was no myth and it was not until the Stratford to Okahukura line was opened in 1932 that New Plymouth began to draw the trade of the area into its hinterland.

The importance of the Main Trunk line, however, does not lie solely in the new settlements to which it gave birth or to the timber resources that became accessible for milling. After 1903, the flow of settlers and trade between Auckland and Wellington was no longer hindered by the frequently rough sea voyage from New Plymouth to Auckland. Through traffic by-passed Taranaki, in general, and New Plymouth, in particular. Taranaki had gained a land route to Auckland but it was a circuitous rail journey, via Marton, and occupied two days. Such a means of transport did not solve the problem of a northern outlet.

Coastal vessels continued to service settlers along the north coast; the quickest and cheapest means of reaching Auckland from New Plymouth was still by sea, across the perilous bar of the Manukau harbour. The diversion of through North Island traffic to the Main Trunk railway brought a decline in the entrepot trade of the port of New Plymouth. The by-passing of Taranaki, by the railway, re-emphasized its isolation, especially from northern settlements. Farmers along the North Taranaki coast and inland Whanganomona, despite twenty years
of settlement, were still isolated for more than six months of the year whereas the new settlements in the King Country possessed, from the time of their foundation, a railway direct to an overseas port. This situation, more than anything else, stressed the necessity of providing these isolated settlements with an uninterrupted means of access to New Plymouth. Commercial interests reinforced popular opinion, in the desire for good communication lines which would not only provide transport services but would also attract new areas and, thus, enlarge the hinterland of New Plymouth. The opening of the port of New Plymouth, in 1917, for direct overseas shipping accentuated the validity of the case.

The adoption of the central route for the Main Trunk railway resulted in dissatisfaction between Auckland and Taranaki, on the one hand, and Wellington, on the other. However, while Auckland lost interest, Taranaki did not forego the possibility of a western rail connection across the Taranaki Uplands. Families had taken up sites inland from Stratford, on the understanding that it was to be the rail junction of the Main Trunk with the New Plymouth-Wellington line. After 1890, a considerable number of settlers moved, eastwards, into the Whanganomona country, into the true Taranaki Uplands. During the next fifteen years, axe and fire removed the forest from even the steepest of hills. English grasses, which were sown in the warm ashes of the autumn burn, replaced the protective forest. The rejection of the Taranaki route for the Main Trunk railway left the settlers virtually without hope of removing their isolation. Some success had been obtained in securing road communication but, for over six months of the year, the Whanganomona to Stratford road was an impassable sea of mud. The cost of transport amounted to 50-100% of the price of goods in Stratford. In the summer of 1900, the charge for carting goods, by road, to Whanganomona was £2. 10. 0 a ton, compared with £3. 9. 0 a ton, in winter, (1) whenever it was possible to get through. The result was the proposal by governing bodies in Taranaki, for a light railway into the area, from Stratford, to provide facilities to service

(1) A. to J.: 1900, 3 - 1A.
and maintain the communities. The development of this idea, into
an urge for a rail connection with the Main Trunk and, thus, a route-
way across the Uplands, forms the topic of the following chapter.
Basic ally, the problems associated with both the inland road and rail-
way resolved themselves into the difficulties of penetrating the top-
ographic barrier.

Settlement had also expanded northwards, along the coastal low-
lands to Pukearehe and inland, up the Uriri valley to the foot of the
Messenger range which separated these farming districts from those
northwards of Tongaporutu. The inadequacies of sea communications
became increasingly apparent, with the growth of settlement after 1890.
A means of land access became an essential. The first track across
the Messenger range was a bridle path which was cut through the forest
in 1890. All travel, before, had been along the beach, at the foot
of the White Cliffs. About the same time, a bridle path was opened
from Awakino, over the Taumatamaire hills and along the upper Mokau
valley, giving access from the coast to Te Kuiti and the Waipa river.
The only portion of the route between Te Kuiti and New Plymouth open
to wheel traffic was from New Plymouth to Uriri — a distance of only
thirty miles. The section was metalled before the beginning of the
twentieth century. The experience of the early period of roadbuilding
illustrated the difficulties which would be confronted in future works.
A dearth of metal sources retarded work; cuttings, through the "papa"
formation, proved to be unstable, due to the continual water-seepage
and the long periods of heavy rainfall; maintenance work had to be
continuous. By 1900, the road to Mokau, over Mount Messenger, was
open for wheeled traffic, during the summer months. It remained purely
a summer road until near the end of the 1920's. The tidal Tongaporutu
and Mokau rivers were crossed by means of a punt. With the indiscrimi-
inate felling of the forest within the river catchments, an increased
run-off resulted in the rapid rise in river levels, during heavy rain-
fall. Even in the summer, communication was often interrupted by high
floods. At the outbreak of the Great War, there was still no regular
coach service, northwards of Uriri.
Today, the coastal road provides, not only the main outlet northwards from New Plymouth, but is an important section of a main highway between Auckland and Wellington. The period after the Great War was an era of important road construction. The popularity of the motor car and motor lorry meant that all-weather roads were a necessity. In the days of the "horse and buggy", a cart could travel on the muddy roads and provide servicable communication between settlements which were in close proximity. The advent of the automobile age made it possible to cover long distances, in a comparatively short time, provided the roads were suitable. As in other parts of New Zealand, the automobile, in Taranaki, gave new life to, hitherto, isolated centres. Moreover, it gave impetus to the roadbuilding era which continues today; an era, which has seen the penetration of the physical barrier of the Taranaki Uplands by modern communication lines. The term "backblocks" is now, rarely applicable. Whereas the ride from Te Kuiti to New Plymouth, by horse and coach, required two strenuous days in 1914, now the 105 road miles form a comfortable journey of three hours by motor car.

Changes in many forms accompanied the new modes of transport. Physical obstacles ceased to be insuperable and became only relative. They were penetrated by modern roads and railways, in order to unite the important centres of production in the Waikato and Auckland with the Taranaki lowlands. The economic structure of both areas was altered and improved. The hinterland of New Plymouth extended as communication lines were constructed into areas, which had, previously, looked to Auckland as their overseas port and major commercial centre.

Isolation, formerly, did not seem an anomaly, an infringement of general principles. The development of the present communication pattern in Taranaki, clearly emphasizes the legacy of the past. Progress and isolation are incompatible in the present age of rapid transport and communications.
CHAPTER III.

The Construction and Development of the Railway
as a Communication Line.

In its growth, Taranaki has fully experienced the feeling of frustration that accompanies isolation. For the first forty years of settlement, New Plymouth could communicate with the rest of New Zealand, only by sea. At one stage, the colony was described as maintaining a precarious existence, with the sea in front of it and the forest and hostile Maoris behind. The completion of the New Plymouth-Wellington railway placed New Plymouth in a favoured position, on the main stream of north and south traffic in the island. With the improvement of the port facilities, expeditious transport between Auckland and Wellington, by combined rail and sea, was offered. However, by diverting traffic through the centre of the island, the Main Trunk railway forced Taranaki, again, into a backwater in the North Island traffic stream. In 1900, there was not the least doubt that the greatest opportunity of removing the isolation lay in the proposed railway connection between New Plymouth and the northern portion of the Main Trunk railway. The realisation of this project appeared to provide the best hopes of an effective northern outlet.

In 1870, the suggestion of a North Island Main Trunk railway was commonly mooted. During the next few years, the construction of the Wellington-New Plymouth line was begun and, utilising different sections of this surveyed line, alternative routes for the Main Trunk railway were proposed. Those through the Taranaki Uplands were serious contenders. As early as 1875, an expedition set out from the forest-enclosed village of Stratford, with the intention of reaching what is now Te Kuiti, in order to obtain a knowledge of the land and report on possible road and rail routes to connect with the Auckland district. Difficulties encountered in the extremely rough and trackless country proved too strenuous for the expedition which was forced to emerge on the coast, near Mount Messenger. Exploration parties, during succeeding years, met with more success.

Selection of the route between Marton and Te Awamutu became a pressing problem, after the railhead reached Te Awamutu in 1883.
Two routes were proposed and surveyed across the Taranaki Uplands. (Fig. 23). The Mokau route ran from Te Awamutu, via the Mokau valley and the coast, to Waitara whence a railway had been operating to New Plymouth since 1875; the other route headed inland from Stratford, via Ohura, to Te Awamutu. The Parliamentary Select Committee, in its report of 1884, rejected the Mokau route, primarily because of the physical character of the country and the coastal nature of the proposed railway. The Stratford route was considered in detail, along with the central route, via the Upper Wanganui and Rangipoki rivers. Economic difficulties in succeeding years hindered railway construction and the final choice of the route was postponed. However, the "battle of routes" continued with the recommencement of construction in 1890. Various parliamentary committees were appointed, during the next decade, to discuss the proposals. Towards the end of the nineteenth century, the renewal of agitation for the Stratford route brought political forces into conflict. Organisations in Taranaki and Auckland supported the Stratford route but Wellington interests were in opposition because they feared the commercial gains that would accrue to the rapidly growing centre of Auckland. The railhead, at this time, was only twelve miles from Ongarue, the point of divergence of the routes. An immediate decision was necessary.

In 1899, the present line of the Main Trunk railway - the central route - was chosen; the Stratford route was considered the best alternative. Thereafter, the proposal for a railway along the Stratford route assumed separate identity.

The adoption of the central route for the Main Trunk railway disappointed Auckland and Taranaki interests. Auckland diverted its attention to pressing for the rapid completion of the trunk line. However, Taranaki could not forego the Stratford railway. Settlers had taken up land around Stratford, and inland, on the understanding that the town was to be the railway junction. After 1890, settlement extended further inland, to Whangamomona, where, during the next fifteen years, axe and fire destroyed the forest cover. High quality English grasses were surface sown in the ashes, producing a rich sward.

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(1) A. to J.; 1884, I-6.
Fig. 25. Pioneer farming in the Uplands. High quality English grasses were surface sown in the warm ashes of the brush burn. A view of the east Stratford district in the early 20th century. The telephone was frequently the sole means of communication during the winter when "papa" surfaced roads were impassable. Logging, stumping and ploughing of the land proceeded first around the homestead and farm buildings which were nearly always on the valley floor but above flood level. Even the steepest of hills were cleared of forest. Instability of soil and scrub reversion accompanied the decline in fertility after two or three years of grazing. During the occupation of the Uplands thousands of acres resembled the rugged landscape shown here.

(Turnbull Library photo)
for two or three years, on the enhanced fertility of the soil. The rapid exhaustion of the foreign fertility was followed by reversion to second growth. The indiscriminate destruction of the protective forest was accompanied by instability of hillsides; mass movements of soil scarred the landscape. Materials, such as fertiliser and fencing wire, were required, in quantity, if the land was to be kept in production. Roads were primitive; lack of metal meant that "papa" - surfaced roads were impassable during the winter. The only feasible means of transport to relieve the plight of settlers would be a railway. The outcome was the commencement of the railway from Stratford to Whangamomona. However, there was always present in the minds of the people - sub-consciously at least - the urge for a northern communication line across the Uplands, a line which would accomplish the effective removal of the land isolation of Taranaki.

The first sod was turned on the Taranaki connection with the Main Trunk railway in 1901. By 1911, the line was operating for a distance of thirty-five miles, from Stratford to the foot of the Whangamomona saddle where a long tunnel was incomplete. Agitation among Auckland commercial interests and the farming settlements of Ohura and Matiere resulted in the commencement of a branch line from Okahukura, on the Main Trunk, to Ohura. Settlers in the districts of Ohura and Whangamomona were in a comparable position. Great hardships had been endured by the backblock families. Although only twenty to thirty miles from a modern railway, both settlements were completely isolated for more than half the year. Construction work was begun at Okahukura, in 1911. Progress at both ends was fitful. Scarcity of labour, during the Great War, combined with varying economic conditions to retard construction but neither of these factors, nor the huge engineering difficulties presented by the topography, were totally responsible for the long delays and slow rate of progress. Construction was retarded or accelerated by the whims of the Government, until the line became popularly known as "the plaything of politics". Auckland interests were primarily responsible for the construction of the northern section; Taranaki interests for the southern. By 1922, the ten miles between Matiere and Okahukura were completed while Whangamomona was connected with Stratford.
The years immediately after the Great War were characterised by a further increase in the number of settlers in the Taranaki Uplands. Thousands of acres were often taken up in one holding; huge areas of forest were burnt off the hills. The railway sections from both Stratford and Ohakukura, originally constructed to serve the settlers, became prime factors in facilitating the rapid expansion of settlement. Men, with little practical experience in the farming problems of the Uplands, acquired large holdings. Surface sown grasses became a common sight among charred tree stumps. The year 1924 can be claimed to mark the end of the futile rush to obtain farms, from which, it was commonly believed, fortunes could be made in a short time. Disaster accompanied disillusionment. The haphazard farming methods resulted in the rapid reversion of hillslopes to second growth. Fertility declined, until the high quality English grasses - white clover (Trifolium repens), ryegrass (Lolium perenne), cocksfoot (Dactylis glomerata) - disappeared and low quality grasses, such as danthonia (Danthonia dilosa) and browntop (Agrostis tenius), became dominant. Instability of the soil increased the problems of the hill-country farmer. Many of them found it impossible to maintain a continuous grass sward on the hills; extensive areas of manuka (Leptospermum scoparium) became increasingly common, reflecting the declining fertility. The culmination of the period of illogical and wasteful land settlement was the abandonment of thousands of acres to the encroaching second growth and ultimate succession to forest.

The passing of the Deteriorated Lands Act of 1925 aided bankrupt farmers, by granting remissions of rent and loans. Settlers had been forced to respect the physical factors of the landscape. (1) A saner policy of land development attempted to check reversion to scrub and to stabilise the soil by re-sowing, sub-division and topdressing. (2) Railway facilities were important means of implementing the policy.

By 1926, rail cartage was possible from Stratford to Tahora and from

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(1) See the investigation and report by a special committee: "The Deterioration of Crown Lands in Mid-west Districts of the North Island" : Journal of Agriculture, Vol. 31, 1925.

Okahukura to Ohura. Settlers were no longer in a state of isolation. Cheaper freights and quicker, all-year transport gave farmers immense advantages.

Progress leagues in Taranaki, in co-operation with Auckland Chambers of Commerce, formulated a new policy which had as its object the completion of the railway from Ohura to Tahora - a twenty two mile gap. Public opinion supported their demands for, and re-iterated the advantages of, an Auckland connection. Greater activity began with the abandonment of the wheel-barrow construction methods of earlier years, during which progress had been slow. However, the closing of the gap was more formidable than any previous work. Several deep river valleys, with their steep dividing ranges covered with trackless forest, confronted the engineers.

From Stratford, for twelve miles to Douglas, the railway runs through undulating country which, physiographically, forms part of the lower slopes of Mount Egmont. The country is dissected by terraced river valleys, with rapid flowing streams in boulder-strem beds. At Douglas, the character of the country changes completely, the volcanic formation giving way to upstanding, "papa" ridges and trench-like, river valleys. The rivers, after rapid descent for short distances from their sources, run very slowly in meandering beds, characterised by short rapids and low falls, with intervening reaches of comparatively still water. Similar terrain continues to Tahora, near the Tangarakau river. Twenty two years were required to construct the Stratford-Tahora section of forty eight miles; the nineteen miles, between Okahukura and Ohura, occupied fifteen years. In both cases, the topography of the country was the principal factor retarding progress but the varying economic and political conditions were not insignificant factors. From Okahukura, the railway passes to Tuhua through a long tunnel under the range of hills which divides the catchments of the Ongarue and Ohura rivers. The remainder of the route is within the valley of the Ohura river. Throughout, bridge building was a major problem because of the transport difficulties peculiar to the district. River beds were frequently blocked with logs and tree stumps. Numerous floods swept away construction works. The difficulties were accentuated by the rivers rising rapidly, as a result of the increased runoff from
deforested catchments. "Papa" cuttings proved unstable; ballast for fillings had to be transported into the area. These inherent difficulties, derived from the physical character of the area, confronted construction gangs, not only on a few sections, but on every part of both lines.

The topography of the land between Tahora and Ohura also presented major difficulties. The two railheads were separated by the extensive divide between the Tangarakau and Ohura rivers. The barrier consisted of approximately parallel watersheds, all rising 600 to 700 feet above river valleys which, themselves, are 400 to 500 feet above sea level. The whole area was still thickly clad with forest in the 'twenties.

As far as human occupation was concerned, it was a veritable "no-man's land", through which the railway offers, even today, the only effective means of communication. The greatest difficulties were experienced between Tahora and the Heao river which are separated by the rugged core of the Tangarakau ranges. Within eight miles, the railway passes through six tunnels, aggregating three miles in length. From the Heao river to Ohura, the topography was less of an obstacle.

In 1925, the tunnelling equipment, released after the completion of the Otira tunnel in the South Island, arrived in Taranaki. The new Government policy abandoned the wheel-barrow methods of earlier years, in an attempt to effect an early completion of the railway. A base camp was established three miles from Tahora, at Tangarakau flat, forty acres of scrub land, previously notable, as being the only piece of level land for miles around. To reach it, a temporary tramway was laid from Tahora and, along the line, the complete tunnelling equipment was transported. A steam power-house was erected from plants obtained from Otira and Mangahao; generators, air compressors and lighting plant for the settlement were installed. From the power-house, current was distributed for electric locomotives and compressed air for drills working at the tunnel faces. The "camp" was built of wood and, at one time, supported a population between 900 and 1,000. Shops did a thriving business but the township declined as the railway neared completion. A virtual "ghost town" today, it retains minor importance as a railway station and maintenance centre.
The construction problems demanded a high degree of initiative on the part of the engineers. War experience assisted in overcoming one problem when the method used by the New Zealand Tunnelling Corps in throwing a bridge across the Canal du Nord, during the retreat of the Germans in 1918, was applied to the spanning of the Tangarakau river. The central span of eighty feet rests on concrete piers which are, themselves, fifty feet above the normal water level. As the river is subject to sudden floods, it was impossible to erect superstructure with any degree of certainty that it would remain, until the job was completed. The eighty foot girder to carry the railway was erected on land and counter-weighted with a sixty foot girder for the shore span, plus several tons of ballast. The central span was then drawn across the river, by winches operating from the opposite side. When it reached its final position, it was still in a state of balance.

Another bridge, which is fifty six feet above normal river level, had to be placed in position by means of an aerial cableway. Bridges, although not numerous, presented problems unequalled on any other section of the railway.

The major engineering difficulty, however, was that of transport.

From the time of the construction of the Tangarakau base camp until the completion of the line, methods were constantly altered to suit changing conditions. The 600-700 foot divides of three small tributaries of the Tangarakau river were formidable barriers, necessitating four tunnels, aggregating two and a half miles in length in only five miles of railway. Tunnelling had to be simultaneous at every face, if rapid completion of the line was to be effected. Work, day and night, was continued in three eight-hour shifts. Transport over the high ridges and across deep valleys, from the base camp to the respective tunnel faces, was successfully overcome by a combination of electric trams, jig-line, hill road, horse tram, motor truck and horse and sledge.

Work at fillings and cuttings was continued at the same time as tunnelling. Hill roads, with grades of one in one and a half, provided the chief means of transport, the cost of which was ten shillings a ton from Tangarakau to the first river valley while to the next valley, the cost rose to thirty five shillings a ton. The topography of the country was
such, that great difficulty was experienced in maintaining transport between the construction gangs and the base camp. Some of the required materials could not be carted by sledge; they had to be man-handled for three miles over two ridges, 800 feet high. Tracks were canals of oozing mud throughout winter and after heavy summer rains. The problems of transport were not solved until the completion of the tunnels.

Tunnelling presented the greatest problem, after that of providing transport facilities. The first three tunnels from Tangarakau were not of a serious nature. Number four was more difficult. Immediately a cut was made in the ridge, which to all appearances was stable, it began to slip badly and, repeatedly, the heading timbers were crushed in. This was overcome but only four chains of tunnelling were completed when a creek was met, at a point where the tunnel emerged, for a short distance, in a deep ravine in the hills. The intention was to make the tunnel continuous. The creek was dammed and piped over the tunnel by means of a reinforced spillway, with the strengthened side of the tunnel acting as the dam. Close to the tunnel entrance in the Mangaone valley - one of the three tributaries of the Tangarakau river - is the notorious "pug" cutting. A large pocket of formation was met in the ridge which, although possessing an appearance of solidarity, was apparently a large slip. The "pug" continued to slip over a length of seven chains, from 180 to 200 feet up the cliff face, despite all efforts to prevent it. The tunnel had been completed. Forced to the last resource the engineers experimented with new approaches. Only a certain amount of deviation was possible because of the limitations imposed by the tunnel entrance. After a number of trials, a feasible route was located and formed but it left only thirty feet of solid formation between the line and the "pug". Slipping was common in all cuttings but was, generally, of a less serious nature. Minor construction works such as culverts and water drains are numerous. Care had to be taken to guard against the effects of the heavy rains,

(1) An unstable mixture, usually of heavy clays, with a high water content, capable of flowing under pressure.
Fig. 26. Bridge building was a major problem for railway engineers. Numerous small span bridges cross the gutter-like valleys of small streams. Rapid flooding frequently obstructed the erection of superstructure. A confined valley crossed by a railway bridge on the Douglas-Mangamona section. The makeshift superstructure was later removed.

(Turnbull Library photo)
Fig. 27. Railway and road construction until 1925 was retarded by the wheel-barrow methods. Axes were used to clear the impeding forest. The "papa" was reduced by picks and shovelled into barrows and wheeled away. Frequently local farmers formed gangs to hasten the completion of works. A view of a road construction party in the Whanganui district. Most of the workers in the photo were pioneering their own farms but transport was the first essential.

(Turnbull Library photo)
Fig. 28. After 1925 the new Government policy abandoned the wheelbarrow construction methods. Pick, axe and shovel were still essential but progress was increased. A view of a party working on the Takura-Chura section.

(Turnbull Library photo)
characteristic of the area. In 1924, prolonged rains damaged the Whangamomona section, blocking the railway for a year. However, despite the protracted difficulties, the complete line between Stratford and the Main Trunk railway was built in accordance with the best trunk line standards.

The railway follows the easiest, inland route across the Taranaki Uplands. From near Stratford to Tahora, it follows the general line of the catchment divide between the Waitara and Wanganui river systems but, throughout the entire course, the route is primarily determined by river valleys. In passing from valley to valley, the railway avoids steep grades by means of numerous tunnels. Not only does the railway bind two provinces possessing much in common, but it also passes through land which, even at the time of the opening of the line in 1932, was only semi-developed. The future value of the line, in this respect, was realised, even when the railway was first under consideration.

The report of 1899(1) stated that, even without consideration of its function as an Auckland, Wellington and Taranaki connection, the railway was a necessity for the future progress of the area, owing to the long distances which most of the country was from a market and the difficulty in maintaining all-weather roads. The completion of the railway brought an end to the hardships experienced by the pioneer settlers. The railway, however, came too late to save some farmers, in the fight to keep farms under production. Thousands of acres of abandoned country are likely to always be sub-marginal farmland whose only complete vegetation cover is the natural forest. However, the railway did help to rehabilitate many disheartened farmers. Costs of transporting materials, fertiliser and of marketing farm products were greatly reduced. Cattle and sheep markets were no longer closed to settlers for long periods of the year. That the railway was an important asset, was shown by the progress evinced in the Ohura and Matiere districts, after 1922.

After 1932, inland districts gained ready access to the seaboard at New Plymouth. Overseas port facilities were brought seventy to eighty miles nearer to Ohura and Matiere. Even greater advantages

(1) A. to J. : 1899, C– 9.
accrued to other areas which, before, had had to find an outlet by means of the Main Trunk railway. Reduced haulage costs, access to profitable markets, the saving of loss of weight by trucking stock instead of droving, the reduced distance to freezing works and dairy produce grading stores, shorter routes for the railage of wool for disposal or shipment, all these factors effected substantial savings for the primary producer. The improvement of roads has emphasized the general prosperity of areas which, no longer, can be regarded as backblocks or insignificant settlements. With increased use of artificial fertiliser, more intensive farming methods have become possible.
The Taranaki Uplands are, today, the major source of supply for the fat lamb farms of the Taranaki lowlands.

The commercial value of the rail link between the Auckland and Taranaki Provinces can not be overlooked. The Main Trunk railway had forced Taranaki into a deadwater in communications. The balance began to swing back, after 1932. The rail distance between Auckland and New Plymouth was reduced to 286 miles, as compared with 417 miles via Marton and travelling time was halved. The value of the shorter distance and travel time was illustrated, immediately after the opening of the railway when Taranaki assumed importance as a perishable goods market for Auckland products, such as fish, fruit, potatoes and other early vegetables. Competition in manufactured goods was also stimulated. Better facilities became available for transporting Waikato coal into Taranaki. The low grade coal deposits of the Upper Hokianga and Tangarakau area were developed; the coal mines of Bennydale and Puketihi, and the open cast workings at Waitawhenua rail large quantities of steam coal for Taranaki dairy factories and the freezing works at Waitara and Patea. Taranaki timber companies gained direct rail access to their principal forest resources of the central and southern King Country.

The Stratford railway provides a suitable alternative Main Trunk line. The fifty additional miles are compensated by the lower altitude to which the railway has to climb. The maximum elevation is Stratford, at a height of 1,108 feet above sea level, while the Main Trunk reaches 2,660 feet, at Waiau. The importance of the line was apparent in May, 1948, when slips, on the Main Trunk railway, closed it for a fortnight, during which period, all traffic was diverted through Stratford.
Fig. 29. The short span bridge and embankments shown in this view near Chuma are a repeating feature along the railway. The drainage of the swamp in the foreground has been abandoned.

Fig. 30. The loading ramp for motor lorries carrying coal from the Wairakau open cast mine, eight miles away, to tip their loads into railway wagons.

Fig. 31. A general view of the aerial endless cable which brings coal in buckets from the Pukitihi mine, several miles inland, to the railway. Old cables lie underneath the present cable.

Fig. 32. The loading shed where the coal is sifted and tipped into railway wagons.
The justification of the railway has been severely questioned during the last few years because it has not yielded revenue, in proportion to the high capital cost of more than three million pounds for the eighty nine miles of railway. The Tangarakau section reached a maximum figure of one hundred thousand pounds a mile, in construction. The average figure is more than thirty thousand pounds a mile. When the line was begun, in 1901, no-one denied its justification but the slow rate of construction prevented its completion, until after the automobile had begun to seriously challenge the railway as a means of transport. By 1932, the prime need for the railway had disappeared. The coastal road had become the principal route across the Taranaki Uplands, providing services of greater economy, especially in time. To validate the position of an uneconomic railway, the Railways Board, in 1932, stated that "the railway is to be regarded as the means of transport for the district to the exclusion of competitive services". Thus, the roads of inland Taranaki were not improved on a par with the coastal highway. The progress of the southern King Country and north-eastern Taranaki was, once again, retarded through the lack of modern communications. Only since 1945, has the problem of all-weather road access been seriously considered.

Today, the railway provides only a secondary communication line across the Uplands. The value of the route, as a means of ending the northern isolation of Taranaki, had been largely usurped by the earlier construction of an all-weather, coastal road. The railway was twenty years too late. The demands of modern road transport had occasioned a more important communication line before the opening of the railway in 1932.
CHAPTER IV.

The Construction and Development of Roads across the Taranaki Uplands.

The road is the most ancient, as well as the most universal, of all land routes. In Taranaki, as in nearly all the world, roads have grown out of the needs of local transportation. The rapid expansion of surfaced highways, during the past few decades, has been contemporaneous with the phenomenal increase in the use of motor vehicles. The development of the road pattern across the Taranaki Uplands is related to both physical and historical conditions.

There are two main road routes; the inland road, linking New Plymouth and the southern King Country; and the coastal road which provided the earliest means of modern communication between New Plymouth and Te Kuiti. The latter route is, today, the main highway.

The coastal road approaches to the principal Maori trail linking Taranaki with the Waikato. The origins of the route have been outlined above. (1) The development of this road, into the major communication line which effectively removed the isolation of New Plymouth from the north, occurred in the post-Great War period. The advent of the automobile, as the popular means of travel and transport, after 1918, was the prime factor in the construction of the road as an all-weather route. The New Plymouth to Uruti section was metalled before 1900 but it was not until a decade after the Great War that a completely metalled surface existed between Te Kuiti and New Plymouth. Although a motor bus service which claimed to be "regular", had begun between the two centres by 1923, it was not until five years later that this claim was valid. By 1928, the coastal road was in common use, winter and summer. At long last, the jumbled ranges of the Uplands were no longer a complete barrier. Several major problems were overcome before the outlet was opened as an effective, communication line. They possessed much in common with those that the engineers experienced throughout the construction of the railway.

(1) c.f. Chapter II.
The bridging of the numerous rivers draining into the North Taranaki Bight presented important engineering difficulties, in the years before the introduction of modern methods of road construction. Deeply incised between steep banks, the rivers presented problems which man accentuated by indiscriminate felling of the forest within the catchments. The hazard of floods was greatly increased. Moreover, the route was forced close to the coast by the bordering hills which meant that rivers had to be crossed at the widest points; that is, at the tidal estuaries. Originally punts were used to ferry man and horse, in the early days, and, later, the motor car. Naturally, this means of crossing rivers was often dangerous, especially during the winter. Disasters were common and fatalities not infrequent. It was a deterrent to travel of considerable consequence. The bridging of the Mokau river was one of the final construction works undertaken before the road was suitable for all-weather traffic. With the completion of the bridge in 1927, the popularity of the route was greatly increased. Another important feature of the physical character of the route was the absence of extensive supplies of suitable, roadng materials. Between Awakino and Uriti, the dearth of metal sources was as important a problem as throughout the railway construction. Likewise, the clearing of the dense rainforest required unavoidable time and labour; cuttings in the "papa" formation were constantly slipping which necessitated considerable maintenance work. For many years, a system of toll gates aided County Councils in the provision of finance for this work. The Awakino-Mahoeunui section was a further deterrent to travellers. At Awakino, the road leaves the coast and runs north-east to Te Kuiti and the Waipa valley. Originally, the route traversed the Taumatamaire range of hills which border the Awakino on the north-west. The rugged topography necessitated long, steep grades which, to be improved, required considerable expense and work. The re-routing of the section, through the Awakino gorge, provided a safer and better road. The narrow river valley, combined with the necessity of constructing the road above flood level, still presented some difficulties. However, roadng materials were abundant and limestone was used, almost universally, to
macadamise the surface. The section was opened to all-weather traffic in 1923 and has since become a popular scenic route.

From the outset, the routing of the road between Uriti and Tongaporutu was the critical section. At Uriti, the road engineers were confronted with the topographic barrier of the Messenger range which ends abruptly at the coast, in the high and steep White Cliffs. The barrier had to be crossed; it could not be circumvented. The road, following the line of the old bridle path, was extensively reformed in 1922. Hewn out of the steep hillside, it winds up and over the lowest saddle in the range, reaching an elevation of 610 feet at the summit. For many years, summer travel, only, was possible but by 1928, it had been tar-sealed. The section was one of the first with a sealed surface, a fact which emphasized the dangerous nature of the route. By 1928, the coastal road was open for all-weather traffic from New Plymouth, through to Te Kuiti. The barrier of Mount Messenger was crossed by a tar-sealed road; the two main tidal rivers of the Tongaporutu and the Mokau, had finally been bridged and the punt ferries abandoned; the dangerous Taumatawhaire hill road, with its steep grades and treacherous surface, had been superseded by the beautiful route through the Awakino gorge.

The coastal road formed the first northern outlet across the Taranaki Uplands. By 1923, a motor service was in operation between Te Kuiti and New Plymouth. It was scheduled as running three days a week, the journey requiring eight and a half hours of travel. Despite the fact that it was frequently interrupted by slips and flooding following heavy rains, the service was an important advance on earlier means of communication. In 1911, the mail coach service between Waitara and Urenui was a two hour journey and the return fare was four shillings. The distance was only nine and a half miles! No definite schedule could be affixed to the Waitara to Awakino mail service.

During these years, it was a common occurrence for passengers to walk over the Mount Messenger road, the coach being incapable of transporting them over the eternally wet and unstable "papa" surface. The

(1) c.f. Chapter II.
terrible state of the roads in the Taranaki Uplands contrasted, sharply, with the well-drained and well-formed roads of the lowlands which, indeed, were widely recognised as the best all-weather roads in New Zealand. However, by 1928, regular and comfortable service, by modern means, was in operation to Te Kuiti and thence to Auckland.

The coastal shipping service which had provided the sole means of communication to and from the New Plymouth settlement during the early years of its history, found itself unable to compete with the superior facilities offered by modern land transport. The coastal road provided means of servicing the settlements of Mokau and Tongaporutu more cheaply, efficiently and with greater rapidity than was possible by coastal vessels. Traffic between Auckland and Taranaki went by land. The coastal shipping service was, eventually, discontinued after 1930.

The value of the coastal road lay, not only in its removal of Taranaki's isolation from northern New Zealand. It also provided an all-weather motor road between Auckland and Wellington, a route which had increasing significance as the volume of motor traffic between the two principal cities of the North Island expanded. New Plymouth re-assumed the position it had lost in 1908 as a strategic centre in the North Island traffic stream.

Since 1928, the coastal road has been greatly improved and, today, it carries virtually all of Taranaki's motor traffic across the Taranaki Uplands. Other road routes are of less significance. Realignment of the road, with the removal of dangerous bends and minor deviations to avoid steep grades, has been done in conformation with the modern standards of the Main Highways Board. In March, 1949, this Auckland-Wellington highway through New Plymouth was officially opened as the first completely tar-sealed road between the two centres. However, a critical section remains between Mahoeuai and Piopio. Here the road follows a narrow, winding route across a series of parallel, drainage divides. In 1948, and again in May, 1949, serious slips blocked this portion of the road, thus reminding Taranaki of the tenuous nature of the link which exists with the Waikato and Auckland. The importance of the section is not, primarily, in regard to the through North Island route but because the amount
Realignment Works on the Main North Road.

Fig. 33. The Mohakatino estuary. The coastal terrace with the old route and bridge can be seen as well as the new cutting and filling. New bridge not yet begun. Note high tide mark. (Photo taken just after full tide.)

Fig. 34. Straightening of the road in the Mimi valley.

Fig. 35. A road filling, strengthened against attack by tidal movements, has cut off the head of an inlet which has become a swamp. The Mohakatino estuary.
of traffic is relatively small. However, the volume of local traffic is large. Moreover, the area forms the transition zone between districts which have direct community of interest with New Plymouth and those which are dependent upon Hamilton and ultimately, Auckland. Mahoenui, at the southern end of the section, is served from New Plymouth; Piopio from Auckland. The narrow zone dividing the respective hinterlands is primarily associated with the physical character of the country. However, the human factor is by no means insignificant because it is the difficult stretch of man-made road which makes it uneconomical for New Plymouth commercial interests to expand beyond this point.

Modern motor roads through the centre of the island, via Tau-marunui and Taupo, have superseded the New Plymouth route in importance, as a link between Auckland and Wellington. This fact has, however, increased the relative importance of the coastal route from a provincial viewpoint. The road formed a modern communication line between Taranaki and the Waikato before the completion of the Stratford-Main Trunk railway. From the year of its completion, the railway was confronted with serious competition by road transport. Daily bus services provide rapid and efficient means of travel between Auckland, Hamilton, Te Kuiti and New Plymouth. The railway monopolises long distance transport of goods. Despite inter-competition, the railway and road have been the major factors in the geographic expansion of the commercial and economic hinterland of New Plymouth. The coastal road has become the principal communication line across the Taranaki Uplands. It has been the means of removing Taranaki's northern isolation which resulted from the previous inability of traversing the encompassing hills. It is the communication line, along which a large proportion of the trade of the Mahoenui, Aria and Mokau districts flows to New Plymouth. Further extension of the hinterland of the overseas port of New Plymouth appears possible, as the northern sections of the road are reconstructed, in accordance with the standards promulgated by the Main Highways Board.

The route utilises the easiest topographical lines of the country. It follows the best route across the Uplands, despite the numerous
Fig. 36. Inland of Urenui. Looking along the northern extension of the Taranaki lowlands, towards the White Cliffs.

Fig. 37. North of Urenui the country becomes more rugged as the border of the Uplands is approached.

Fig. 38. The approach to the Messenger range along the Wai valley. The road route is marked by a cutting.

Fig. 39. The winding road over Mount Messenger.
Fig. 40. The main north road paralleling the Tongaporutu river.

Fig. 41. The Awakino Gorge. The white colour of the road surface is due to the limestone material used.

Fig. 42. Rugged country between Kahoeenui and Plopio.
Fig. 43. A vertical air photo of the Tongaporutu river mouth and the coastal terrace, immediately north of the White Cliffs. The limited area of beach exposed at low tide (when photo was taken) and the cliffed coast can be seen. The contrast between the terrace and coastal hills is marked. The main north road can be seen winding down into the river valley from the terrace.

(N.Z. Aerial Mapping Photo)
construction difficulties. However, the difficulties were of lesser magnitude and fewer in number than those confronted by the engineers on the inland road.

The inland road approximates, closely, to the route of the Stratford-Main Trunk railway. The main deviation is between Tahora and Ohura where the road follows the Tangarakau river which has carved a narrow gorge through the upstanding core of the Tangarakau ranges. Originally, the road was begun with the purpose of giving access to the settlers around Whangamomona. This was possible, during the summer, after 1898 but the journey was extremely arduous. At one period, freight charges rose to a phenomenal rate of ten pounds a ton, per mile. Settlers, working in gangs, attempted to improve the road but the complete absence of local metal sources defeated their efforts. By 1900, a "papa" road was formed to Tahora. The idea of forming an inland road across the Uplands assumed increasing importance. Despite good intentions, it was not until 1929, nearly thirty years later, that Tahora was linked by an all-weather road with Stratford. The railway, completed to Tahora five years earlier, provided the means of transporting metal into the barren Uplands. Burnt "papa" was used as a means of surfacing the roads but the expense prohibited its extensive use.

Reaching into the Uplands from the north, a branch of the Te Kuiti-Taumarumui road paralleled the railway to Ohura. The opening of this section for all-weather traffic was also consequent upon the construction of the railway. Separating Ohura and Tahora were the ranges of steep razorback ridges and deep valleys which proved such obstacles to the railway engineers. However similar problems were avoided by constructing a road through the extremely narrow Tangarakau gorge. The route was surveyed between 1898 and 1900. The bridging of the river in numerous places presented the greatest difficulties. Despite the early beginning of construction, it was not until 1940 that the gorge road was metalled. The slow progress in metalling the entire inland road was a reflection of the difficulties of transporting large quantities of metal into the area. After 1932, however, improvement of the road was handicapped by the decision of the Railways Board that the railway was to be regarded as the means
of transport for the district, to the exclusion of competitive services. The decision added another difficulty to those already delaying the improvement of the road.

Whereas the railway passes from one river valley to another through tunnels, the road winds up and down the ridges which divide the river valleys. The razorback nature of the divides necessitated steep grades which, combined with the eternal zigzagging of the road, make the journey exceedingly treacherous and dangerous. Rapid travel, the first essential of modern communications, is impossible. Despite some improvement in alignment and the lowering of gradients, the route is essentially second class. Extreme care is a prerequisite to travel. Between Ohura and Stratford, there are six saddles, by which the road is carried from one river valley, over the 800-1,000 foot divides, into the next valley. If the expensive work of numerous tunnels is not to be entailed, the route will remain unsatisfactory for modern means of travel. The limited extent of tar-sealing is a reflection of its unfavourable nature for heavy traffic. Maintenance costs have always been very high. The Stratford County Council has been able to meet them but the Whangamomona County Council has found itself financially incapable of keeping its portion of the inland road in reasonable order. This is because the County lies wholly within the Uplands. Farms are marginal or sub-marginal, with a low schedule of rates. The income of the Council is small. The Public Works Department has been obliged to undertake the maintenance work. The lack of geographical planning in the original delineation of counties has resulted in difficulties all over New Zealand, similar to those which confront the Whangamomona County Council.

The inland road performs two main functions today. Firstly, it is used as a means of transporting a small proportion of the low grade coal which is mined in the Uplands for markets within the Taranaki lowlands. A very small volume of traffic is involved. Indeed, local traffic over the inland road, especially between Ohura and Stratford, is insufficient to justify the maintenance costs. The main value of the road lies with the second function - that of tourist traffic. Wonderful scenery attracts the tourist. The
The inland road runs alongside the railway for considerable distances.

Fig. 44. A view from the top of the Pohokura Saddle. The road winds up the ridge, the railway along the valley and through a tunnel under the ridge.

Fig. 45. The road and railway approaching the Tahora saddle.

Fig. 46. The western end of the Okahukura railway tunnel and the overhead road where road and rail meet near Tuhua.
Tangarakau gorge, through which the road winds, is comparable in beauty with the Awakino gorge and Mount Messenger. Virgin forest, unmauled by man, contrasts with the slip-scared and burnt-over areas which have resulted from his disastrous attempts to farm the land. Any importance that the inland road may claim, derives from these two functions. The route has never been an important means of servicing inland Taranaki or the southern King Country. The Tangarakau gorge is normally closed by slips during the winter. Thus, a further limit is imposed on its value. The inland road represents a masterpiece of bad planning, combined with the complete disregard of the physical factors of the landscape. The potential value of the road is limited to that of summer tourist traffic. The development, in recent years, of a new, all-weather road access to the Ohura, Matiere and Taumarunui area has captured any trade from these districts that went over the inland road. It is this comparatively recent communication line across the Uplands which will play the major role in the binding of north-east Taranaki and the southern King Country, commercially and geographically, with their closest overseas port of New Plymouth.

In 1898, a road route from Ahi titi, on the coastal road north of the Messenger range, was surveyed along the valley of the Tongaporutu river and its tributary, the Mangatava, to the Waitaanga plateau where the Waitara, Tongaporutu and Kohakatino rivers have their headwaters. From Waitaanga, at an elevation of 1,500 feet above sea level, the route climbed to a height of 2,000 feet, in order to cross the north-south line of ranges which form the divide between the catchments of the Wanganui and the complex of rivers draining into the North Taranaki Bight. Once across the ranges, the route descended sharply into the Ohura valley. At Ohura township, the road divided. One branch followed the northern section of the present inland road which, here, turns north-east through Matiere to Mangatupoto on the Taumarunui-Te Kuiti main highway, giving easy access to both centres; the other branch headed southwards, along the present inland road for a short distance, and, thence, continued eastwards, via Tokirima, until it met the Upper Wanganui river which it followed for approximately
Fig. 47. A portion of the road through the Tangaranau river gorge.

Fig. 48. One of the four road bridges over the Tangaranau river, against a background of virtually primitive forest.

Fig. 49. Herly's Bluff on the Mangarei river. A "papa" surfaced section of the State highway between Chura and Taurarumui.

Fig. 50. In the Chura valley. A section of the alternative road route between Chura and Taurarumui.
fifteen miles to Taumarunui. This road, from New Plymouth to Taumarunui, was not formed until after 1900 and was not regularly traversed until 1929. It was essentially a summer road and remained unimproved until 1945. During the period, its sole value was as a local means of transporting timber from the sawmill at Waitaanga.

Because of the railway monopoly of transport services, the Ahititi-Chura road appeared to be destined to a similar fate, as that which had befallen the inland road. Indeed, the road, as a through route to Chura, was closed for many years. However, the demands of the settlers and the commercial interests of the Chura and Taumarunui area roused Taranaki bodies. Chambers of Commerce co-operated with newspaper interests and County Councils to press for the construction and maintenance of the route as an all-weather road. This was eventually accomplished in 1945. The potential value of the road immediately became apparent, from the increased circulation of the "Taranaki Daily News" which initiated a new service to the area. Leaving New Plymouth at 2 a.m., the newspaper reaches Taumarunui at 7 a.m. and Taupo, Taihape and Te Kuiti at 10.30 a.m., whereas the distribution of the "New Zealand Herald" - the popular Auckland newspaper prior to 1945 - is not possible until 2.30 p.m. The newspaper has been a valuable organ, by which the southern King Country and north-east Taranaki have been awakened to the advantages of trading with New Plymouth. The west-east route brought Taumarunui twenty road miles closer to New Plymouth than by the inland road and forty all-weather road miles closer than via Te Kuiti and the coastal road.

The demands of modern automobile transport necessitated an all-weather road between north-east Taranaki, the southern King Country and New Plymouth, if the area was destined to, eventually, look to New Plymouth as its commercial centre and overseas port. The railway had developed a degree of community of interest but Auckland, also, had strong commercial influences within the area. The improvement of the road has, already, aided the closer binding of north-east Taranaki in particular, to its natural centre of New Plymouth. Continued improvement will help to further extend the hinterland of the city-port, into areas which henceforth, will have greater economic
incentives to trade with New Plymouth, rather than with Auckland.
The first step in the fulfilment of this desire was accomplished
in April, 1949, when the Ahititi-Chura road and its extension,
via Tokirima, to Taumarunui was declared a State highway. The
decision, to constitute the route as a State highway was as welcome
to Taranaki, as it was to the southern King Country and Chura districts.
Since the beginning of land settlement, the two areas have been
separated by the barrier of hills that stretch north-south through eastern Taranaki. The barrier has meant that Auckland, instead of
New Plymouth has been the outlet of the area, although part of it
is actually within the Taranaki provincial boundary. Some degree of
the isolation, it is true, was removed with the completion of the
Stratford-Main Trunk railway but, under the demands of modern trans-
port, the need has been emphasized for a State highway, giving quick,
all-weather access between Taranaki, the King Country and the Taupo
region further east. An improved Ahititi-Chura-Taumarunui road can
give this access in good measure.

Reconstruction will necessarily occupy many years, before the
road will be in accordance with State highway standards. The Chura-
Taumarunui section is largely a product of the last decade and, where
the road is formed from the steep side of the Wanganui river valley,
the traveller is faced with considerable danger. The section is
still unmetalled and is closed during the winter. As a result,
nearly all traffic utilises the alternative route through Matiere which,
although seven miles longer, has the advantage of passing through more
productive country in the Chura valley. Already, settlers and busi-
ness firms in Chura and the southern King Country are utilising the
new outlet to New Plymouth. Chura is, now, only seventy three road
miles from an overseas port. At present, most of the Ahititi-Chura
road must be traversed in second gear because of the winding nature
of the steep grades but it is increasing in popularity. Access to
the sea coast is important for these land-locked areas. Recent
figures of the summer holiday season of 1948-49 for New Plymouth in-
dicate an increase in Chura and King Country visitors. This reflects,
in part, the importance of this route across the Uplands. To the
detriment of Auckland, commercial firms in New Plymouth have begun to
develop the advantages that accompanied the recent opening of the road as an all-weather route. Continued expansion appears certain.

The story of the development of roads across the Taranaki Uplands emphasizes the relation between physical and historical factors. In the case of the inland road, the physical character of the country presented difficulties which, alone, are sufficient to make road construction a laborious and lengthy job. Man added to the problem, by attempting to give, to the railway, a monopoly of transport services. The comprehension of such conditions are fundamental to an understanding of the reasons why Taranaki, in general, and New Plymouth, in particular, have suffered a long period of isolation, imposed upon them, initially, by the physiography of the province. The semi-circle of low but exceedingly rugged ranges formed a topographic barrier which was not penetrated by a northern, all-weather motor road until 1928 - more than eighty years after the original settlement. The development of communication lines evolved into a pattern which has effectively displaced the isolation of Taranaki. In this pattern, the road was an essential because even "in its most humble function it (the road) is a necessary guide without which progress from place to place would be a ceaseless experiment; it is a sustenance without which organized society would be impossible."(1)

(1) H. Belloc: The Road: New York, 1925.
CHAPTER V.

The Present Pattern of Communications and its relation to the Distribution of Population.

The study of the historical development of communication lines across the Taranaki Uplands has illustrated the maxim that "physical conditions have both restrictive and permissive relations to human activities". (1) The evolution of the present communication pattern is the outcome of more than a hundred years of European occupation. The younger generation of today, born and bred in an era of rapid motor and rail travel, experience difficulty in comprehending the conditions in which their ancestors lived. In 1844, the overland journey from Kawhia to New Plymouth was a strenuous walk of five days. (2) Even at the end of fifty years of settlement, travel across the Uplands was only slightly improved. Beginning from New Plymouth, a circular journey in 1892 has been recorded. (3) To accomplish the fifty miles from New Plymouth to Tongaporutu and across the upper Waitara and Tangarakau rivers to the confluence of the Whara and Wanganui rivers, required seven days on foot. From this point, downstream for the hundred miles to Wanganui, occupied an additional three and a third days of steady canoeing. Yet, to travel the final hundred miles from Wanganui to New Plymouth took only six hours of easy lounging on the once despised railway. Such were the relative advantages of the several modes of communication, existing at the end of the first fifty years of settlement. Today, after the passing of an additional fifty years, a well developed pattern of communications provides modern means of travel.

The focal centre of the present pattern of communications is the progressive city of New Plymouth (Fig. 52). The artificial harbour has been an influential factor in this development, especially since 1917 when it became capable of berthing overseas vessels. Taranaki's economy, in common with that of the remainder of New Zealand, is dependent on

(1) C. D. Forde: Habitat, Economy and Society: London, 1934: p.467
(2) H. S. Chapman: A Walk Through Taranaki in 1844: New Plymouth, 1890 (approx.)
(3) T. Kelly: op. cit.
Fig. 51. The artificial harbour at New Plymouth has been an influential factor in the focusing of the communication lines on the city. This air photo shows the western end of the city and the breakwater with two sheltered wharves capable of berthing overseas ships. The large tanks discernible near the coast are for the storage of petrol brought directly from overseas. All land slopes up to Mount Egmont. The rural picture is typical of the dairying lands of the istlands. In the foreground is the volcanic projection of Parinwatu and the Sugar Loaf islands.

(V.C. Browne photo)
overseas markets for the disposal of its primary products. The fact that New Plymouth can provide direct overseas shipping service, is significant in itself. An additional influence, however, is the unique position of New Plymouth as the single overseas port on the west coast of the North Island (and incidentally the South Island). Moreover, it is midway between Auckland and Wellington, the two major overseas ports at the north and south ends, respectively, of the North Island. Consequently, New Plymouth would appear to be ideally situated, to encompass a wide area within its commercial and economic orbit. However, the fulfilment of this potentiality has been hindered by the physiography of Taranaki. To the early settlers, the rugged Uplands appeared an insuperable barrier to communications. Even Maori trails were few in number. Improved construction methods have, today, pierced the barrier with modern means of communication.

Radiating from New Plymouth, there are three major routes which cross the Taranaki Uplands (Fig. 52). Extending south-eastwards to Wanganui and Wellington, are the main south highway and the railway. The route traverses the lowlands, east of Mount Egmont, to Patea whence it follows the only natural route - the coastal terrace - across the Uplands to Wanganui and the Manawatu plain. It was the earliest land route used and remains the only direct communication line with Wellington. The two other routes, across the barrier, are of more recent development. A first class highway to Te Kuiti and thence to Auckland parallels the coast to Awakino. Here, it turns inland to the Waipa valley which provides easy access to the productive Waikato basin.

Crossing the heart of the topographic barrier, is the railway connecting New Plymouth, via Stratford, with the Main Trunk railway at Okahukura. Begun at an early date but of late completion, this third communication line is, nevertheless, a fundamental in the pattern of communications. The railway route is also followed by the inland road which, however, is only of secondary importance. Connecting the inland communication line with the highway along the North Taranaki coast, is an all-weather, but at present, second class road from Ahiiti to Ohura. If the condition of this west-east route, plus its extension to Taurarumui, is raised to State Highway standards, it will become a major line in the network of communications across the Taranaki Uplands.
Fig. 52
COMMUNICATION PATTERN
The Uplands no longer isolate New Plymouth and the populated lowlands. The communication pattern provides an extensive area, with means of trading advantageously with New Plymouth, as compared with Auckland and Wellington. The communication lines reach across the upland belt, to connect with the main through routes which traverse the centre of the North Island. The trade of areas along the Main Trunk railway and central highways, has been tapped by the roads and railways radiating from New Plymouth.

The study of the distribution of population, in relation to the communication pattern, likewise, exemplifies "the restrictive and permissive relations" of human activities to physical conditions. At first, the railway construction rigidly determined the pattern of inland settlement and the growth of towns remote from the port of New Plymouth. In recent years, the main highway and motor transport have changed the emphasis. Smaller towns, removed from the port and off the railway lines, have now a readier access and can be expected to flourish, relative to their earlier stagnation because of isolation. Seaside resorts, especially beach camps at Urenui, Waitara and New Plymouth and the Egmont mountain resorts, have already begun to show, by increased numbers of holiday makers, the beneficial effects of road transport. In addition, it has, everywhere, blurred the sharp rigidity of the earlier pattern of settlement and hasoccasioned the outward sprawl of many towns, notably New Plymouth. Conversely, the recent stagnation in population growth and decline in importance of some centres, can be largely attributed to the effects of motor transport.

The rugged topography of the Taranaki Uplands has severely restricted settlement. On well-drained and fertile flats, especially in the Ohura-Pe Kuiti depression, mixed dairying and fat lamb farming are important. However, the backcountry is predominantly divided into large holdings (averaging about 800 acres), carrying store sheep and cattle. In a little over a month (January 10th to February 16th) of this year (1949), over 100,000 sheep and lambs were handled by autumn fairs, within and on the borders of the Uplands. Aria, with the most extensive saleyards, handled nearly a quarter of the total. The farming map (Fig. 53) shows that communication lines and productive areas
Fig. 53

Farming Map
Fig. 54. Fertile dairying land in the Churra valley near Matiere.

Fig. 55. A hill country farm near Douglas. Buildings above flood level - dairying on alluvial flats and store sheep on the hills. Note bare soil showing in the holding paddock.

Fig. 56. Sawmill and timber yards at Waitanga.
are coincidental. This is a combined reflection of less rugged topography. The map also highlights the extensive area of unfarmed land. Within this area, there are numerous sawmills, such as at Waitaanga. The Uplands, in conjunction with the southern King Country, are a major source region of native timber. Mangapēshi, the important sawmilling export centre on the Main Trunk railway, produced eighteen million feet in 1948 or 7% of the total production of native timber in New Zealand.\(^{(1)}\)

Within the Labour Department zone, bounded by Tokaanu in the east, Waitaanga in the west, Kopaki in the north and Horopito in the south, sawmills employed 1,516 male employees in October, 1947. The figure had increased to 1,650 by October, 1948.\(^{(2)}\)

Another resource within the Uplands is coal. The quality is generally poor but is suitable for steam coal. The brown coal, mined at Mangapēshi, is of slightly higher grade. All the workings are sections of the extensive but normally thin and discontinuous layers that underlie the area between Mokau and the Tangarakau country.

Centres associated with coal mining and timber milling, do not greatly influence the distribution pattern of population which is primarily related to farming. Consequently, the population is concentrated in three areas (Fig. 57). Along the South Taranaki coast, there is a belt of relatively dense settlement; Waitotara County has a density of 7.2 persons per square mile; that of Wanganui is 7.4.\(^{(3)}\)

County figures mask the true picture because they include virtually unpopulated areas of the inland hill country. The relative picture is obtained by comparison with the Whangamomona County which, composed solely of steep hills and deep river valleys that are typical of the Uplands, supports, on the average, only 1.9 persons per square mile. A narrow belt of comparatively dense population also borders the North Taranaki coast but it thins towards the north, as the coastal ranges converge on the coast. The density figure for the Clifton County is 5.6 but this, also, covers unpopulated hill country and, to avoid misinterpretation, must be related to the sparsely populated Whangamomona County. The belt extends up the Awakino and Mokau river valleys,

\(^{(1)}\) Figures quoted in the *King Country Chronicle*, March, 1949.
\(^{(3)}\) All population figures are from the *Population Census of 1945*. 
merging into the third main area of relatively dense population within the Taranaki Uplands. This area is confined, principally, within the Te Kuiti-Ohura depression which is drained by the Ohura and Ongarue river systems to the south and the Waipa to the north. An extension of the region is eastwards, to Taumarumui and along the Main Trunk railway and central highway. Thus, topography has influenced the distribution of population while it has also been the dominant factor in the location of the communication lines. An important consequence is that the communication lines are routed through the populated and productive areas within the Uplands and tap extensive areas whose trade, to a large degree, converges along these lines to New Plymouth.

From a wider viewpoint, the map of population density displays the obvious contrast, that one would expect, between the closely settled Waikato and Taranaki lowlands and the sparse population of the intervening Uplands. The Waipa Country, north of the border of the Uplands, averages 33.7 persons per square mile; the Ohura Country, within the Uplands, has a density of 4.1. To the south of the hill country, the average rises again and reaches 29.1 persons per square mile, in the Taranaki County.

The urban drift of population has accentuated the difference. With the development of improved methods of farming and a more efficient transport system, the same proportion of population is not essential to produce the necessary food supplies and raw materials from the farm. Industrialisation on the factory system, in place of domestic organisation, has aided the movement. The necessary adjuncts to modern standards of living are best produced by urban communities. The amenities of life (from a popular viewpoint) are provided more easily in towns. All these factors, working in combination, have developed a Dominion-wide drift of population to the larger towns.

In Taranaki, the movement of population has tended to reinforce the contrast in population densities, as between the Uplands and lowlands. Both the maps of the 1936-45 intercensal movements of total population and rural population portray the decrease within the Uplands and the relative and, in some cases, absolute increase of the lowlands. (Fig. 57) The representative, Upland's Counties of Clifton (the town of Waitara is within the Taranaki County), Ohura, Whanganomona and
Wanganui (the city of Wanganui is within the Waitotara County whose total population increase is accounted for by this fact) show greater decreases than lowland counties and contrast markedly, with the increase recorded in the younger farming districts of the Waikato area. Indeed, the inland Taranaki counties have suffered the longest and most persistent, rural declines in New Zealand. The apparent anomalies of the small decrease in the Kaitieke and Waimarino Counties and the increase in the Taupo County, are explained, to a large extent, by recent scientific aids to farming, such as cobalt fertiliser to combat "bush sickness"(1) amongst cattle and the number of sawmills within the areas. The representation of population densities by county figures masks the true picture but, with necessary reservations in interpretation, they may be claimed valid for the purposes of the above discussions.

The map of the pattern of communications shows that towns are almost invariably situated on roads or railways. Especially is this true of country towns, the location of which is determined by the density of rural settlement and the available economic resources. The close relation of communication lines with the latter factors, explains the juxtaposition of towns with roads or railways. The development of modern communications has been influential in the movement of population in towns. The diminishing importance of Eltham, as a staging point, is due to the popular use of the motor car. Its population decreased 2.32% between 1936 and 1945. The situation of Patea and Waitara on transport routes, near the border of the Uplands, has contributed to their growth. Similarly, Stratford's progress has been aided by its site as a road and railway junction. Above all, Te Kuiti, the important communications centre on the northern border of the Uplands, experienced an intercensal increase in population of 8.84%.

The Uplands are characterised by a "ribbon" settlement pattern which has developed along the narrow coastal terraces and river valleys; the lowlands, to the north and south, with townships only two or three miles apart, have a "rurban" type of settlement. Secondary roads which carry a large volume of traffic, are numerous on the lowlands while the

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(1) A wasting disease, affecting cattle and sheep, caused, primarily, by a deficiency of cobalt in the soil and therefore, in the pasture on which the animal subsists. Commonly associated with pumice deposits.
Fig. 58. The wide, metalled, main street of Chuma township. Essentially a farming centre, the township has the only District High School between Taurarumai and Stratford. It is a nodal centre for communications. Population 474 (1943)

Fig. 59. The town of Waitara, situated on the Waitara river near the border of the Uplands, has always been important in communications. A view taken in the 1930's. The small coastal vessels are a reminder of the past shipping service, while alongside is the modern road bridge erected on the site of the original bridge built before 1930. The town buildings occupy the river terrace. Behind rises the undulating surface of the lowlands sloping up to Mount Egmont (in distance).

(Mrs. L. Tate photo)
Fig. 60. This oblique air photo illustrates the "ribbon" pattern of settlement in the uplands and its relation to roads and railway. The township of Manganewana, population 134 (1945). Cf. Fig. 9

(V.C. Brown photo)
few that are formed within the Uplands, are essentially "no-exit", side roads, branching from the through communication lines. These few, secondary roads are in a generally poor condition. Often badly formed, many are passable only in summer. More roads and better roads are the prime requirements for progress within the populated areas of the Uplands. Thomas Kelly admirably sums the situation up. "A distinguished and successful General was asked what were, in his opinion, the three most essential requirements for an army; he replied, 'Boots! boots! boots!' If I were asked what are the three first requisites for the successful settlement of these rich forest lands, I would answer, Roads! roads! roads!"\(^{(1)}\)

These words were written in 1892 but they ring equally true today.

\(^{(1)}\) T. Kelly: op. cit.
CHAPTER VI.
The Expanding Hinterland of New Plymouth.

The city represents probably the most complete modification of a portion of the landscape that man, through his constructive and destructive contacts, has been able to make. There, human beings are crowded together in greatest numbers and density. Partly as a result of this intense occupation, man has, here, brought together his mightiest concourse of "material-culture" features. The completeness of the cultural cover tends to mask and, at the same time, greatly modify and even obliterate, the original, physical features of the site. Even beyond the margins of the city proper, the settlement makes itself felt by an intricate network of communications, for these routes represent the essential lines of contact with the countryside that it serves and that supports it. Along these routes travel the large quantities of food and raw material, to be consumed and otherwise dealt with, by the city organisations. It is along the same channels that the city's products feed back to the surrounding countryside. "Cities do not grow of themselves. Countrysides set them up to do tasks which must be performed in central places."(1)

The functions of a regional centre are the driving force of urban life and they are primarily dependent on the hinterland and the satisfaction of its requirements. Urban functions are generally classified into three main types; the service or commercial factor, the industrial factor and the combined administrative and social factor. New Plymouth,(2) in common with a great number of cities, depends primarily for its existence on the commercial function. It is the servicing centre and import and export entrepot for its hinterland.

The tributary region is based on the distribution of the main industries for which the city is the commercial centre, the degree of accessibility by road and rail and the overlapping and competition by other towns. New Plymouth is favoured by having no near neighbour, no city to drain away its trade, no rival to measure strides with, as for example Napier and Hastings. As a port, it can develop its


(2) Gazetted as a city on January 27th, 1949.
backcountry and still remain a well balanced city. It has not become a Lyttelton to a Christchurch. Neither is it the overspill of a larger city, such as is Lower Hutt. New Plymouth was once a railhead and, as such, was regarded as isolated but the situation changed with the development of motor transport to the north and south and the linking of the Main Trunk with the Taranaki-Wellington line. With the rapid growth in popularity of air transport, especially since 1945, the modern aerodrome, within easy reach of New Plymouth, has assumed increasing significance. The 1936-1945 intercensal growth of 11.44% is a reflection of New Plymouth's favourable situation, in relation to the hinterland. It is probably unique in this respect - that, as a port and the capital of a leading primary producing province, it has no competitor, near its own size, within the provincial boundaries.

The tributary region of any town or city cannot be delineated with accuracy. Overlapping of hinterlands tends to occur. The boundaries are, necessarily, zones of transition which, for convenience, are normally mapped by a single line. The problem is further complicated by the dynamic character of the region. Delineation at one time may not necessarily be correct for a later or earlier period. The extension of the hinterland of New Plymouth - that area which has developed a direct community of interest with New Plymouth - since the beginning of European occupation in 1841, is bound up, inevitably, with the construction of communication lines. Especially is this apparent in the areas, marginal to and within, the transition zones between Auckland (Hamilton) and Wellington (Manganui) spheres of influence.

The expansion of the hinterland of New Plymouth between 1841 and the opening of the Main Trunk railway in 1908, was associated with the growth of settlement on the Taranaki lowlands. The early construction of the main south road and railway resulted in the coastal overlapping of the tributary regions of Manganui and New Plymouth, the boundary of which has remained remarkably static. The North Taranaki coastal settlements - Awakino, Mokau and Tongaporutu - were serviced by coastal vessels from the river port of Waitara and later, with the construction of the artificial harbour, from New Plymouth. It was not until
towards the end of the nineteenth century that settlement expanded into the forested Taranaki Uplands.

The years from 1908 to the completion of the Taranaki Link with the Main Trunk railway in 1932, formed the most important period in the extension of the hinterland of New Plymouth. The construction of the Main Trunk railway opened new areas for settlement, in the King Country and Taranaki Uplands. Settlers moved inland, from the railway to Ohura and Matieres; from Stratford, the Whanganumon area was settled. These potentially valuable districts were closer to New Plymouth than to Auckland or Wellington but the absence of communication lines across the topographic barrier proved advantageous to other centres. The terrible state of the road to Whanganumona, early in the century, resulted in attempts by Wanganui firms to open river traffic with the area. The Tangarakau river was cleared of logs and snags as far as the Putikituna road landing, thus enabling shallow draught river boats to carry goods to within ten miles of the Whanganumona township. The attempt, however, was unsuccessful. Flooding of the Tangarakau river, in 1904, brought downstream a varied assortment of logs and stumps, products of the extensive clearing of the forest within the upper catchment. The earlier work of clearing the river was rendered useless and the project was abandoned. Immediately prior to the opening of the railway, a river boat service operated between Wanganui and Taumarumui. For many years, river traffic was of considerable importance, in servicing the central and southern King Country. Within the area, there still remains a degree of the earlier commercial dominance of Wanganui. Some business firms maintain direct connections with Wanganui, although the river trade ceased long ago. Part of the present commercial structure of the King Country is built upon the wool supplies which move outwards, via road and rail, to the wool stores at Wanganui. Coastal shipment to Wellington provides connection with overseas ships.

The opening of the Main Trunk railway, naturally tended to force the ever-growing population to look towards Auckland. The railway brought large numbers of settlers from Auckland, into the new land. Auckland capital financed them; Auckland wholesalers supplied the retail
stores. Before the Great War, Auckland advertisements in the local papers of Ohura and Taumarunui, were a common feature; those of New Plymouth firms or agents were infrequent. Only incidental references to New Plymouth activities or organisations were to be found. The Auckland Railway League was a prime mover in the commencement of the Okahukura-Chura railway in 1911. The dominance of Auckland influence remained throughout the central and southern King Country, until the completion of the Stratford-Okahukura railway in 1932. The broad imprint remains today. Factors, such as dairy companies maintaining shares in the Auckland Freezing Works, tend to perpetuate the legacy of Auckland influence, although the isolation of these areas from their natural centre of New Plymouth, no longer exists. The railway link with New Plymouth and the Main Trunk, via Stratford junction, has provided the prime means of tapping the trade of the King Country, especially that of the Ohura and Matiere districts. By 1914, a direct rail link was completed between Whanganui and New Plymouth along which the products of these inland areas reached New Plymouth and the ingoing supplies were transported. Even before 1914, the Ohura district was beginning to realise the potential possibilities of a rail link with New Plymouth. A local newspaper put the feeling into words, in 1911. "The railway is approaching from the Stratford end slowly but surely. Well if New Plymouth is to be our port we won't grumble at the Harbour rates."(1) The counter, by Auckland, took the form of the aforementioned Railway League and the consequent beginning of construction of a railway link, between the Main Trunk and Ohura. For years, the settlers of Ohura and Matiere relied upon the help of the League, to expedite the rail connection but they found that they were leaning on a rotten reed. In fact, Auckland business men were allowing Taranaki to steal a march on them, by pushing the line forward from the Stratford end. The settlers cared little whether they made Auckland or New Plymouth their business centre, as long as they had easy access to a port that was not too far distant. After 1917, with the completion of the artificial breakwater and wharves, New

(1) Ohura Advocate, Vol. 1, No. 1, 1911.
Fig. 61. The partial success man has achieved over the environment is shown in this photo of a portion of the Ghura valley near Katie. In distance, a deforested razorback ridge stands out. Scrub and fern invasion now prevents its use for grazing. In the foreground, another ridge already recovered by forest. The valley plain is capable of more intensive use. Abandonment of these farms to second growth has been a common result of many reckless attempts to farm the Uplands.

Fig. 62. Successful land utilisation inland from Uremui. The forest has been preserved on the steeper slopes and less favourable gullies. Romney sheep graze on good quality pasture grasses.
Plymouth's claim was further advanced because it was no longer a mere coastal port but an overseas shipping terminal. The painter was cut from the Auckland League and a King Country League was formed, to further the interests of the settlers in the inhospitable Uplands. It was not until 1932, however, that the completion of the railway provided means for New Plymouth firms to open direct branches in Ohure and Taumarumui, and begin the inevitable competition with Auckland organisations.

Towards the end of the period from 1908 to 1932, the metalling of the main north road was completed. Coastal settlements were no longer dependent on the irregular coastal seafar service for communication. The service had to be abandoned because of the inability to compete, on equal terms, with the speed and efficiency of the automobile. Motor transport bound the areas, more strongly, with New Plymouth, effectively breaking down the barriers of local isolation and independence.

The years witnessed the wide extension of the hinterland of New Plymouth, until it reached, approximately, its present limits (Fig.63). Since 1932, the principal development has been a closer tying of these areas with New Plymouth, by means of the improvement of roads. Modern highways have tended to extend the limits but competition with Auckland interests has enforced a position of relatively stable equilibrium. The one area, in which recession of Auckland's sphere of influence and New Plymouth's advance is possible, to any great extent in the immediate future, is towards Taumarumui and the Taupo area. This will be largely influenced by the improvement of the west-east road from Ahititi to Taumarumui and the extension to Tokaanu, on the southern shore of Lake Taupo. The eastern portion of the area is at present, within the pioneer fringe of the central volcanic plateau. Factors which are likely to aid the movement, are threefold; the improvement of the road connection with New Plymouth, noted above; the possibility of the New Plymouth port becoming the timber export centre to Australia, for the 400,000 acres of exotic forest in the Putaruru-Taupo district; and, lastly, the proposed wool stores which are to be constructed at New Plymouth. Taumarumui is still intimately associated with Auckland. The map of relative road distances (Fig.63) suggests a possible increase in New Plymouth's influence. Present trends justify this deduction.
Fig. 63

ROAD DISTANCES
Officially, Taumarumui is within the Auckland zone of petrol servicing but, in practice, it receives its supplies from the New Plymouth overseas petrol terminal. A single petrol car can traverse the return journey from New Plymouth, thrice weekly, whereas a car from Auckland, can only travel twice weekly. In the case of Te Kuiti, it appears unlikely that it will be brought within the hinterland of New Plymouth, despite the shorter distances in comparison with Auckland. This is because of the Taranaki Uplands which, although no longer a complete barrier, still hinder trade and nullify the advantages of the shorter distance. Moreover, Auckland interests have established a strong commercial hold through their close association, since the original settlement.

The present era is essentially, one of consolidation. The development of communication lines across the Uplands was accompanied by the expansion of the commercial sphere of New Plymouth, until the economic margins were reached. No wide expansion, similar to that which occurred between 1908 and 1932, can be envisaged in the immediate future. The map of relative road distances portrays the marginal nature of the present boundary of the hinterland of New Plymouth.

Local changes, both of recession and advance, are still in operation. With the improvement of the condition of the Mahoeenui-Piopio section of the main north highway, New Plymouth services may extend past the present major limit, at Mahoeenui, to include Piopio. Such movements, however, will not greatly influence the present tributary region of New Plymouth.

The growth of the population of New Plymouth reflects the expansion and progress of the hinterland. Since 1900, its population has increased fivefold. It has been a steady growth. The most marked increase was between 1916 and 1921 which corresponds with the beginning of direct overseas shipping service at New Plymouth. With the construction of roads and railways, a communication pattern which focuses on New Plymouth, has evolved. The improvement of the communication lines has been accompanied by the development of the rural region that has a direct community of interest with New Plymouth, and as the regional economy took form and expanded, so the town grew in response to the needs of the rural region it serves. The interests of town and country
are identical. New Plymouth, shorn of its hinterland would soon wither; the only reason for its existence is service to the rural region of which it is a part. The truth is expressed in the Maori proverb which is taken from the Coat of Arms of the city of New Plymouth.

"Maori Mahi Maori ora; Maori mangare Maori mate." - the industrious heart lives or survives; the indolent heart dies or goes under.
Problems and Prospects.

The historico-geographic study of the development of communication lines across the Taranaki Uplands, has shown some of the complex problems which have been overcome in the growth of the European settlement of New Plymouth. The Maori inhabitants of the fertile lowlands were conscious of the Uplands as a barrier to travel but, in their economy, long distance transport of goods played only a minor part. The merest of trails sufficed, as routeways, to serve their needs. Land travel was avoided as much as possible, for it was a hazardous and strenuous journey along the narrow, winding trails. In the European economy, good land communications were an essential factor. Yet in 1890, after fifty years of European occupation, the Uplands, to a large degree, still isolated New Plymouth and the populated Taranaki lowlands. In common with all the early settlements in New Zealand, it was coastal sea transport which maintained the Taranaki colony through the pains and problems of youth. With the early completion of the railway to Wellington, New Plymouth assumed strategic importance in the passage of traffic between Auckland and Wellington. Virtually all through traffic was routed to New Plymouth from Wellington. The journey to Auckland was completed by sea, thus circumventing the northern barrier of the Taranaki Uplands.

The value of reliable lines of land communication was made evident, at an early date, by the construction of the main south road and railway. It can hardly be believed that, when the building of the railway was proposed in the House of Representatives, a conservative faction in Taranaki petitioned Parliament, praying that a railway in Taranaki be not built, "as such a policy would ruin your humble petitioners".（1）The railway was built; the ruin so far has been mercifully avoided! The advantages that accrued, gave impetus to the construction of similar communication lines across the northern portion of the Uplands. The opening of the Main Trunk railway in 1908 diverted North Island traffic through the centre of

（1）T. Kelly: op. cit.
the island and thus renewed the earlier isolation of the Taranaki lowlands. New Plymouth, once again, became a backwater in the traffic stream. The need for a northern land outlet was urgent. Yet, it was not until twenty four years after the opening of the Main Trunk railway that the Taranaki connection, via Stratford, was completed. Indeed, more than thirty years - from 1901 to 1932 - were required to effect the connection. This slow progress is partly a reflection of the inherent physical nature of the Uplands but the various economic and political conditions that existed during the thirty year period, have been contributory factors. Meantime, progress in the construction of an all-weather, road outlet to the north had outstripped that of the railway. The main north road - the coastal highway - was thus, the prime factor in removing Taranaki's isolation from the Waikato basin and Auckland. Especially since the Great War, the widespread and popular use of the motor car and motor lorry has detracted value from the railway. Competition between the two forms of transport has become an outstanding characteristic of modern communications.\(^{(1)}\) In Taranaki, as in other parts of the world, it is the modern highway which has gained the advantage. The highway is fundamental in the present pattern of communications.

As communications were developed across the Uplands, there was an accompanying expansion of settlement into the region, from both the Taranaki lowlands and from Auckland. Pastoral activities were the principal occupation and their effect has been largely destructive. Indiscriminate removal of the protective forest cover, combined with overstocking with flocks of Romney sheep, have resulted in a rapid decline in soil fertility and a consequent deterioration of the grass sward on the steep hillslopes. Invasion of pastures by native scrub and exotic weeds is a common sight. Likewise, mass movement of soil has resulted in the immeasurable scars that disfigure the landscape. In local areas, more rational farming methods have succeeded in stabilising the soil and, at least, in holding

\(^{(1)}\) See a pamphlet by A. Gray: Roads and Railways - Notes on Transport Problems in New Zealand; Auckland, 1931.
Fig. 64. A road inland from Uriki with poor drainage, bad foundation and only a thin veneer of metal over the "papa". Although only a light shower of rain had fallen, water remained on the surface for many hours afterwards.

Fig. 65. A secondary road near Chura, narrow but serviceable even in winter. Such roads are few and far between in the Uplands.

Fig. 66. "The Ideal." The wide, well drained, tar-sealed surface of the main north road near Te Kuiti contrasts with the above photos. (Figs. 64 and 65.)
scrub reversion to its present limits. Unfortunately, the
surface configuration of the Taranaki Uplands does not favour
the extensive use of aerial topdressing as a means of maintaining
and raising the soil fertility. (1) Nevertheless, the prospect
of rehabilitating many degenerated areas is considerably brighter
than it was in the early 1930's.

A prerequisite to any permanent increase in agricultural
and pastoral production is the construction of more roads and
better roads, for the provision of modern amenities and services.
Over extensive tracts, however, the original forest appears to be
the only permanent form of vegetation cover. Statements are being
continually made and written about the national importance of the
use and misuse of land in the Taranaki Uplands (2) yet there is a
noticeable lack of national or even provincial planning to cope
with the regional problem. Until some regional organisation is
attempted, only minor success in the improvement of land utilisation
can be expected and such success will, almost certainly, be com-
penated for by further unplanned and ill-advised farming methods
in other areas.

The Uplands still remain a problem area in regard to communi-
cations (3) though, to a lesser degree than before. An extension of
the commercial influence of the city-port of New Plymouth accompanied

(1) Recent experiments in aerial topdressing have been confined to
country with a less rugged relief than that of the Taranaki
Uplands. The successful use of aerial topdressing, as a solution
to the hill country problems of the Taranaki backcountry, is con-
fronted with many obstacles. A few of the more obvious are
noted here. Foremost is the problem of obtaining a uniform and
sufficient distribution of fertiliser. The steep slopes and
local wind currents would probably make this uncertain. With the
lack of possible landing strips and the difficulty of ground con-
trol in the rugged terrain, the task would be extremely hazardous.
Under these conditions, the cost would appear to be prohibitive.
Finally, even if a uniform distribution is economically and phy-
ically possible, the problem of fencing for rotational grazing
still remains. Therefore, it appears that the use of aerial
topdressing in the Uplands is, at least in the immediate future,
severely restricted. However, the whole problem of aerial top-
dressing is still in the experimental stage.

(2) See, for instance, K. B. Cumberland: Soil Erosion in New Zealand:
Wellington, 1944.

(3) In July of this year (1949) flooding in the Urutu valley and slips
in the Awakino gorge interrupted motor traffic between New Ply-
mouth and Te Kuiti. More recently (August, 1949) a large subsi-
dence on the railway west of Wanganui disrupted rail traffic for a
fortnight. These occurrences followed a period of prolonged rainfall.
Fig. 67. This vertical air photo shows a few of the communication lines which focus on Tawarunui (population 2,706 in 1966), situated near the eastern edge of the Uplands. The concentration of buildings (right centre) is the western end of the town. In this area, the commercial influence of New Plymouth appears to have the greatest opportunity to expand. With the rapid exhaustion of timber resources, increasing numbers of acres are being used for sheep farming, and, in special cases, for dairying. The long straight line, cleared of forest and scrub, marks the track of overhead, electric power lines.

(N.Z. Aerial Mapping Photo)
the development of communication lines across the Taranaki Uplands. Conflict with the commercial interests of other North Island centres, especially those of Auckland and Wanganui, was unavoidable. Economic advantages that accompanied the completion of the road and railway network which focuses on New Plymouth, have attracted new areas within the hinterland of the city-port. The physical barrier that confined settlement and obstructed land communications for so long a period, has not proved insuperable. Man has overcome the rugged relief, in order to establish land communications but the Uplands remain, and continue to hinder the freedom of his movements.

The study has shown that man has achieved only a partial success over his environment. On the one hand, human ingenuity has improved the environment, by the provision of roads and railways in an area of extremely rugged relief which appeared to prohibit the success of all such efforts. On the other hand, human mistakes have, in many cases, produced landscapes in which mass movement of soil and the aggressive spread of native and exotic weeds are the principal features. Readjustment of farming practices has begun to re-establish the primary industries. In these ways are human ingenuities and human failings portrayed within the environment of the Taranaki Uplands.
Appendix.

(A) Note on Maps.

The shortage of large scale maps covering the Taranaki Uplands has presented considerable difficulties. Those in existence are, generally, out of date or inaccurate. The New Zealand Provisional Series, of one inch to one mile, cover only the Egmont area, west of a line joining Pukearuhe and Patea. The geological maps, accompanying the Geological Bulletins, are of varied quality. Reference was frequently made to County maps and to detailed Land District maps. A valuable source was found in the motor touring maps, covering the North Island (in four sections), published by the Automobile Association.

The two population maps are based on the Census Reports of 1896, and 1945. The map of Maori Trails is based, primarily, on information contained in S. P. Smith's book, "History and Traditions of the Taranaki Coast", New Plymouth, 1858. "The Statistical Review of the Sheep Industry of New Zealand", published by the Department of Agriculture, provided the chief source for the farming map but recourse was also made to the Pasture Map by E. A. Madden and to the map of Cultural Vegetation by K. B. Cumberland, reproduced in his work, "Soil Erosion in New Zealand," Wellington, 1944. The map of rail routes is based on information contained in various Appendices to the Journals of the House of Representatives (c.f. Bibliography). The construction of the relief map presented serious difficulties. Many sources were investigated but the data and aid given by the staff of the Lands and Survey Department of New Plymouth proved the most helpful. The relief map can not be claimed as accurate in detail; it is, of necessity, generalized.

(B) A Specific Area on the Ahititi-Chura Road.

In the absence of detailed topographic maps, recourse has been frequently made to a series of vertical aerial photographs covering the Uplands and made available by the Lands and Survey Department. Within the region, only small areas have been surveyed and contoured. One example is here reproduced, by courtesy of the Lands and Survey Department, New Plymouth. It was traced from the field sheet which had just come off the plane table. The area represented, is on the
Fig. 69.

To accompany Appendix (B).
(N.Z. Aerial Mapping Photo)
Fig. 70.
To accompany Appendix (B).
(N.Z. Aerial Mapping Photo)
Ahititi-Ohura road where it follows the course of the Tongaporutu river and its tributary, the Mangatawa. Many characteristics of the Taranaki Uplands are present. The profiles aid the interpretation. (For location of sections see Fig. 68).

Despite vertical exaggeration, sections A-B and C-D show, graphically, the intense drainage relief and the symmetrical nature of the divides. The steep, narrow ridges and deep, gutter-like river valleys are contrasting features resulting from the dendritic drainage pattern. Sections E-F and G-H emphasize the low degree of fall along the river valleys.

For comparison, two vertical, aerial photographs of portions of the contoured area have been included. The first photo is of the lower river valley. The river meanders to a greater extent and the valley has been more fully aggraded than further upstream. Many difficulties, faced in the construction of communication lines, are illustrated by a comparison of the photos with the contoured map. In Figure 69, the road passes through a tunnel under a long, narrow spur while in Figure 70, the constricted valley has made road work difficult, especially in the region shown in the lower portion of the photo. Settlements are dispersed but stand out with their houses surrounded by trees or hedges. Land utilisation of the hills is small. The contrast of the burnt-over and slip-scarred hills with the stable cover of virtually primitive forest is apparent. The intricate drainage pattern, with innumerable streams flowing into master streams, can also be seen.
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