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FRONTPIECE: Styx Mill study area (outlined) from north, in 1963. Southern Belfast in foreground, Christchurch suburban fringe in distance, with Main North Road and Railway at left.

photo: V. C. Browne
PROPOSALS FOR A SUBURBAN SUBDIVISION
IN CHRISTCHURCH, NEW ZEALAND

A major design study submitted for
the Diploma of Landscape Architecture
in the
University of Canterbury

by
G.H. Densem, B.A.

Lincoln College
to EHD:

May this carry on
where you left off.
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"A town is not the result of a design programme; it is the reflection of a way of life".

Bernard Rudofsky in

Streets are for People.
Since World War II Christchurch has experienced a prolonged period of expanding urban boundaries and suburbs. In the process, the considerable increases of population of this time have been housed adequately according to the standards of acceptable public health, but there has grown also a dissatisfaction with the type of life experienced in the suburbs. Vague criticisms of it are common in the small talk we hear; mental illnesses are of high incidence, and have even collected their own name - "suburban neuroses."

For even so-called well adjusted citizens the desire to leave the suburbs and spend leisure time at baches, beaches, on boats, or "in the country", suggests that our suburban homes do not provide the levels of rest or satisfaction or achievement necessary for a whole life. Generally, although reasonably good standards of home life have been possible within individual home units, the social community of all units collectively does not appear to have matured apace, and is proving undesirably sterile and divisive. The suburbs are perhaps too much a collection of castles, and not enough a collection of people. On the other hand, questions are also being raised as to the economic desirability of spreading the city so wide - in the cost both of land lost to farming and of providing essential services at such low densities. And in Christchurch these problems are all compounded by the completely flat topography on which the major part of the
city is built, leading to visual problems of greater importance than in some other New Zealand cities.

This present study will deal with the social part of the suburbs - that outside the house, and including private yards, streets, and other public land. Its aim is to investigate ways to increase peoples satisfaction with their suburbs, mainly dealing with the visual concerns, but including others where suitable. A look will be taken at how and why the suburbs arose as they have, and then the present - day scene will be summarised. Then, after discussion on methods of improvement, a specific site will be taken, and designed, to illustrate the application of the principles evolved back onto the ground.
II: CHRISTCHURCH - THE SETTING

1. INTRODUCTION

The city has grown to a population of 250,000 people since the Canterbury Plains were first colonised by the English in 1850. Previous to that the only occupation of the area was by a sparse, relatively impoverished Maori population.

People, being as they are compulsive labellers, and the site, apart from small parts of the southern margins, being completely flat, Christchurch has come to be labelled, along surely with a thousand other cities around the world, as "The City of the Plains." Until recently, flat land was feely available for city expansion at relatively low cost, so the city spread wide. From east to west is 12 miles, spacious dimensions for a city of its size. The site is so flat that the city centre, Cathedral Square, 7 miles from the coast, lies only 20 feet above sea level, and the western limits 12 miles inland have still not risen above 100 feet.

Christchurch has also come to be known as "The Garden City" because of the delight taken by some of its inhabitants in the gardens around their homes, and the delight of the city itself in some of its central parks. However, only some parts of the city are so blessed. Others couldn't look much less like gardens, and considerable numbers of people are willing to pay no more than lip service to this ideal. Decline in the average sections size and increases in the cost
of gardening in terms of time taken, cost of equipment and cost of plants is leading to a general decline in the standards of maintenance of, and the amount of land set aside for gardens. Thus "the Garden City" shouldn't be overemphasised today, despite what truth such as label still holds. Christchurch possibly has less claim to this title now than do some of the northern cities such as Auckland or Hamilton.

Nor should a third label for Christchurch be overemphasised. "That most English of cities" is undoubtedly more of English character than one would normally expect so far overseas, but the similarities now remaining derive largely from buildings and layout inherited as hand-me-downs from the past. The strong traditions of what was to have been a model English community are now so tempered by time, distance and local conditions that at most they are only generalised shadows of England. Christchurch today is in spirit a thoroughly New Zealand city, as any Englishman will hasten to comment. But that does not decrease its worth. Nor does such an "English" label do any harm for tourists and National Geographic Magazines, because it has some superficial truth. The danger is when it comes to be believed by inhabitants whose concept of their city should go deeper than the superficial.

Thus we have a city, and three of its labels to be wary of. A look will now be taken at the development of the city, with special interest in its suburbs.
2. **DEFINITION**

The concept of Christchurch's suburbs is a relatively fluid one. The city of Christchurch established in 1850 by the Canterbury Association was quite different to that we know today. It stopped at the four Belts - today's Moorhouse, Fitzgerald, Bealey and Rolleston Avenues. The suburbs at that time were the outermost blocks inside these Belts, but outside the business area, and any settlements beyond the Belts were in those days strictly rural.

Today the Belts tend to demarcate a different boundary - that between the inner city or "urban Christchurch," and the suburbs. Rural land is now that lying beyond the "urban fence" which is the limit of residential spread set by the planners.

For the present study such a vague definition of suburban Christchurch as this latter one will suffice - that land lying beyond the four Avenues and Hagley Park, but within the limits of residential expansion into the countryside.
3. **GROWTH OF THE CITY**

The growth of the city will be considered in four periods:

**Pioneer Period:** from the arrival of the Canterbury settlers in 1850 until 1870 - in general, the time taken to establish the city.

**Victorian-Edwardian Period:** from 1870 until the First World War - generally the hey-day of Colonial Christchurch.

**Inter-War Period:** First to Second World Wars. A time of flux with both social pioneering and a search for new suburban forms.

**Post-War Period:** 1945 until the present, a period of rapid expansion under new forms of suburban layout.

These periods are based on those outlined for the growth of the Auckland urban area by G.T. Bloomfield (1967), and while it may be somewhat of an assumption to transfer them, they were judged to be near enough for the present purpose.

The concept of periods of development is itself possibly a doubtful one, for it creates artificial divisions where none existed in reality. However, they have been used here because they help isolate major trends of suburban development.

Finally, to have transferred such a framework from Auckland to Christchurch and still have it fit so well emphasises the relationship of trends in each community with those of New Zealand as a whole, and suggests strong influence from the central Government and the national economy. Thus although the extent of expansion may have varied between
Auckland and Christchurch, in that Christchurch was more important than Auckland early on, but the situation is now reversed, the types of that expansion have been relatively similar in both cities.

Thus Bloomfield's framework has been held applicable to Christchurch for this present purpose, despite possible objections from the purists.

a) Pioneer Period

At first the Pioneer Period might seem of little importance to the development of the present suburbs of Christchurch.

Firstly from Map 1 of Christchurch in 1866 we see that development was almost wholly within what are now the commercial and industrial areas, which have been largely rebuilt since. Conversely it shows todays suburban areas were mostly still rural.

Secondly, few buildings at that time were of any material other than timber or cob, making for a limited average life span of early buildings. Exceptions are some of Christchurch's public buildings, usually in stone - such as the Provincial Council Buildings, and Durham Street Methodist Church, - although even these are from late in the Period.

Thirdly, what buildings have survived remain as scattered individuals and are therefore largely unnoticed. There is certainly no surviving "Pioneer Quarter" or "Pioneer Street."

Thus the buildings of Pioneer Christchurch are largely lost. However, other important contributions to the appearance of todays suburbs from this Period shoul be borne in mind.
The basis of the residential standards which have been followed since in Christchurch were set at this time. The planners of the Canterbury settlement were men of high ideals, who dreamed of a model settlement based on all that was best in English society, i.e. the social hierarchy and the Church of England. They were men of social position, such as Godley and Fitzgerald, of good academic achievements, which implies having done well at Oxford or Cambridge, and they had the patronage of men in high places, such as Lord Lyttelton. They were active, imaginative and liberal. They had strong backing in both the theory and practice of colonisation, through their involvement with Edward Gibbon Wakefield, for whom Canterbury appeared as both a final attempt, building on South Australia and the several earlier New Zealand colonies, and also an ultimate attempt, being this time strongly based on the Church of England. They also had at the time in England social conditions strongly conducive to their efforts. Vivid examples of the social evils of industrialisation - the England of Dickens - were causing desires both to emigrate and to reform. Politically the middle and lower classes had recently triumphed over the peers, and liberalism was widespread. This was a time of theories and debates and high expectations of good things to come. There was fervour in religious circles also, with the spiritual revival of the Wesleyans, some measure of acceptance of Roman Catholics, and a great zeal among more traditional faiths such as the Church of England to convert to any one of a large number of current beliefs or dogmas. This was the period of the religious tract and the sermon. For the Canterbury Association
therefore, this was a time of coming together of the theories, the ideas, the people, the means, the conducive conditions. They were going to set up a model cross section of the best of the English community, from a benevolent aristocracy, through industrious yeomen to cheerful labourers. The whole would be succoured by a generously endowed church and favoured by the best educational and social intitutions available at the time. The physical nature of the colony was envisaged to match. Streets would be wide and straight, houses warm and airy. Man would have freedom from usurers and landlords. There would be parks and gardens. There would be small farms of 10 or 20 acres beyond the town, with provincial towns, but all looking towards the respectable Cathedral City for guidance in things spiritual, cultural and economic.

Hence the vision and foresight which went into the founding of Christchurch were reactions against the misery and usury of urban England, and a new start to be made on the other side of the world. Hence also the determination to have space and independence, which has come to be one of the characteristics of the Christchurch suburbs.

But Christchurch in the Pioneer Period was far from the grand vision described, for it was not until about 1870 that the settlement began to overcome the physical needs of establishing life on the Plains, and begin to turn to refining it. In the course of those 20 years 1850-1870 the ideals became tempered somewhat by practise and local conditions, and this is the reason for delineating the years 1850-1870 as a Pioneer Period.
FIG 1: THE FIRST SURVEY. The original plan for Christchurch, prepared and pegged before arrival of the settlers at Christmas 1850 by the Canterbury Association surveyors.

(courtesy Dept. of Lands and Survey, Christchurch)
FIG 2: THE SUBURBAN FRINGE 10 YEARS AFTER SETTLEMENT
Armagh Street looking west. Amuri Motors carpark site left foreground, Cranmer Square middle dist, Hagley Park in the bare space at streets end, Riccarton Bush visible in distance at left. Photo taken December 1860 from tower of the Provincial Council Chambers (still standing) by Dr Barker. Note state of the streets, fencing, houses, and gardens.

Courtesy Canterbury Museum

FIG 2: THE SUBURBAN FRINGE 10 YEARS AFTER SETTLEMENT
Christchurch in the 1850's was a desolate village with few formed streets, many temporary houses, no trees and large areas of swamp. While the "town" appearance of Jollies well known map of 1850 (Fig. 1) is misleading to us today sitting beside our heaters thinking back, it must have been devastat­ ingly so to the hopeful colonists arriving in those early days. However, this map embodied the ideal town which the Canterbury Association was implanting in Canterbury, and which came to be greatly valued after the Pioneer Period ended. During the Pioneer Period, however, the great needs were the construction of shelter, then roads, and the drainage of the swamps, in that order, and the great plan remained for some time merely a series of survey pegs amongst the toi toi.

Hercus (1948) described the three components of the site of Christchurch which went to make up the ground condi­tions.

Firstly, fingers of river gravels from the Waimakariri River, penetrating from the North west and of which along with those from the other Canterbury Rivers, the Canterbury Plains are generally composed.

Secondly, finer marine sands forming a series of dunes parallel to the coast in the eastern part of the city, and marking successive stages of retreat of the coastline north of Banks Peninsula. Swamps formed in low areas between dunes and where depressions lay in other surface formations.

Thirdly, the volcanic rocks of the Port Hills and Banks Penin­ sula, overlain by loess and lying south of the city. The whole Christchurch area was of very low gradients and as might be expected was a maze of dry and wet areas where free draining river deposits intermingled with low lying swamp.
A reconstruction of the general pattern of ground conditions in the Christchurch area is seen in Map 2. The original 1250 acres lay largely on dry ground but surrounded by swamp which had to be traversed on any journeys outside town. Further detailed descriptions of conditions will be found in the first chapters of two books - Agnes Hercus "A City Built Upon a Swamp" and J.P. Morrison "The Evolution of a City." See also Figure 2 of this report for part of Dr Barkers invaluable panorama of Christchurch in 1860.

Morrison on page 41 gives a good impression of the tasks facing a settler:

"When the first citizens of Christchurch arrived, they found that although all the requisite number of streets, with their names, existed on the Surveyor's maps, there were certainly none in actual fact. In the work of formation, all residents were called upon for assistance. An old settler recalls that there was no compulsion, but people were none the less "obliged" to help; so the Rev O Mathias, of St Michael's Church, trundled his barrow and wielded a pick and spade with the rest of the new arrivals. When the Municipal Council in 1862 undertook the seemingly never ending task of road construction and repairs the common method of forming a road was to plough gutters at the edges, then plough the surface and pile the soil up towards the centre for drainage purposes.....If, however, there was likely to be considerable traffic, the ploughed surface was shingled and left for the vehicles to "roll" the metal in."

Besides the "planned" town - i.e. the originally surveyed 1,000 acres - settlements were soon appearing in the adjacent areas as seen on Map 1. Roads existed beyond
Christchurch early on, the first two on the Plains being those from Ferrymead to town (Ferry Road) in 1850, and from town to Riccarton Bush, home of the Deans Brothers (Riccarton Road), in 1851. Ferry Road was of prime importance, being the only link between Christchurch and Lyttelton, and thus the outside world, and thus being also the route of arrival of settlers. Papanui Road was also formed early, being the start of all journeys north and, like Riccarton Road, important for the cartage of building timber and firewood from the respective Bushes to town. Travelling conditions must have been primitive because Morrison reports a preference for floating the logs down the ditches to hauling them by bullocks. One bullock train is held by legend to have disappeared in the mud on Papanui Road. Travelling was difficult by any means other than horses, and horses were a luxury only for the well off, so people needed to live within walking distance of their work. Thus, outlying settlements arose. Papanui, Upper Riccarton, Sydenham, Woolston are some of these early outliers.

The importance of such roads and settlements to today's suburbs is that they formed the framework and nucleii of what we now know as the Christchurch urban area. It was within the framework of these major roads that were built the various structures of the residential subdivisions which make up the suburban area. They are also still the major means of our travel about, and conceptualising of, the suburbs which otherwise today form a rather amorphous mass. It should be noted that the locations of these early nucleii were largely dictated by ground conditions, because they
avoided the sandy and swampy areas early on. Thus, being sandy, Wainoni, Burwood and Bromley remained only sparsely settled until the early 1900's, while the east St. Albans, Richmond, and the Spreydon areas did not develop until their swamps were drained, and early settlements preferred the river gravels. Hercus describes distribution of the gravels thus (p. 8):

"Much of Papanui stands on the fan itself, although Papanui Road is a swamp area, and large parts of the Fendalton and Merivals suburbs stand on one of the lobes of the fan. Another large lobe of shingle is to be found in Addington near the site of the A. & P. Showgrounds. This shingle bank reaches down to the east passing into Sydenham and crossing Colombo Street south near the Sandridge Hotel. Yet another lobe reaches across part of Spreydon to the foot of the Port Hills near Hoon Hay."

Drainage of the swamps did not begin as a Christchurch-wide undertaking until after 1870 and this therefore is an achievement of the next Period of development of the Christchurch's suburbs. In the meantime, people draining their land were likely to end up flooding their neighbours or the road, or conversely they were likely to be flooded out themselves when road construction blocked existing drainage courses. Sewerage and rubbish were run off properties and into existing public open drains which soon come to constitute health hazards, and led to several outbreaks of cholera in Christchurch.

The surveyors were facing a gigantic task. Early on they only numbered less than a dozen, but it was their job not only to measure and cut up hundreds of thousands of acres of unmapped land in Canterbury and Westland, but also
to set up and enforce a system of application for, assessment, recording and enforcement of land tenure. It is not to be wondered that in the circumstances, and on the flat terrain, land was set out by squares and straight lines rather than by the measurement of natural lines and boundaries. The result has been a settlement pattern imposed onto the land, in both town and country. This has caused problems since, but under the conditions of the Pioneer Period, with land pressures on both settlers and surveyors, and with people conceiving of no need to retain natural patterns, the needs of Canterbury at that time were answered. Thus arose the grid subdivision, which was to remain the norm in Christchurch suburbs for nearly a century, and is still of influence today. Christchurch can be grateful that the Avon and Heathcote were not rechannelled to conform.

b) Victorian-Edwardian Period

By 1870, the beginning of its next period of development, Christchurch could truly be said to have won the battle to establish itself. Many major works such as drainage and sanitation were still in need of urgent attention, but the city's foothold on the Plains had been secured. After 1870 began a period of consolidation and expansion when many of the early temporary wooden and earth buildings were replaced by more permanent structures. It was during this period that tram routes to the suburbs were opened, and bicycles became commonplace, so housing was thereby able to spread beyond the limits of distance imposed by having to walk to work. What Bloomfield says of Auckland in this time is
equally applicable to Christchurch:

"The city... was transformed from a level of semi-provincial subsistence to a partner in the international prosperity of the late Victorian Period," for the 1870's was the time of the Vogel public works boom when branch railways were built throughout New Zealand, and especially Canterbury. This was the time when Canterbury first became linked with any degree of convenience to the other provinces of New Zealand, when sailing ships were replaced by more reliable steamers, when a tremendous wheat bonanza gripped the Canterbury Plains, land values rose sharply, and the limits of land taken up in freehold were extended across the Plains to the foothills. But by the 1880's soils were exhausted and the boom broken, launching the province into deep depression. However, the final pioneering had been completed and the period of prosperity in the 70's and early 80's had reflected in the development of Christchurch. Once the export of frozen meat was under way in the 1890's, using the new refrigerated vessels to supply large English markets, real prosperity returned, allowing New Zealand a further 25 years of plenty until the First World War. These 25 years could be regarded as the hey-day of Christchurch. Large successful industries had grown up, such as in engineering, for which the city was noted, and Christchurch was both the largest city and largest industrial centre in New Zealand. During the period many of the stone buildings of central Christchurch were built.

Regarding the swamps, it was not until an outbreak of typhoid in the 1870's, with the city's population over 12,000 that the Christchurch Drainage Board was formed and adequate
attempts were begun at drainage and sewerage. The task was completed for the city area by 1903 and then extended to the suburbs until World War I. According to Hercus, the engineers were forced into laying pipes at much flatter grades than usually recommended, and had them working successfully down to 1 in 850 for 12 inch pipes and 1 in 400 for 6 inch pipes. Once drained, areas bypassed by early settlement could now be infilled, and this became one of the two features of the spread of housing during the Victorian-Edwardian Period: the earlier city was consolidated and infilled, while at the same time, the limits were expanded into surrounding areas.

Systematic asphalting of streets was not begun until 1911, so the era of sealed suburban roads belongs mainly after this present Period. Likewise electrification which had begun as early as 1889 but did not come into general use until the opening of the Lake Coleridge Hydro Electric Station in 1915. Water supply had been regularised earlier, first but without great success, in 1863, and finally with a high pressure supply in 1909. Poles and telegraph wires also became a feature of the street scene in this era, showing in photos from the 1880's on. Likewise street lighting which according to Morrison, became general in city and suburbs with the advent of the Lake Coleridge supply in 1915.

Transport had a great influence on development of the suburbs in this period by enabling the city to spread. Railways were opened to Ferrymead (1863), Lyttleton (1867), and Papanui (1872), but more important were the steam and horse-drawn tramways built after 1879 to Papanui, Addington, Linwood, Woolston, Summer, New Brighton, and North Beach.
Not only did they serve to consolidate the isolated nodes established during the Pioneer Period, but new areas adjacent to the routes were opened up. The amounts of expansion beyond the original Christchurch city for 1886 and 1926 can be seen in Map 1. The suburbs were expanding both outwards around the centre and also as ribbon growth along the tram routes like great spokes of a wheel, and preceding the general limits of development. The process was hastened after 1905 by the beginning of faster electric trams in service. It has already been mentioned that the bicycle began to play a part once roads became sufficiently civilized. Christchurch was well known at the turn of the Century for its large numbers of bicycles.

Thus by 1915 Christchurch had been transformed approximately to the city as we know it, with services, roading, city centre and suburbs setting the basic patterns of today, and a far cry from the mud and tussock of 1870. But if the latter part of this Period was the hey-day of Christchurch, so it was also the hey-day of the 1 chain road and quarter acre section which have since come to be held as typical of the New Zealand suburb. There were exceptions to them, as will be mentioned later, but generally, the standards having been established at the time of Settlement, it became the Community's duty during the 1890's and early 1900's to provide for them, and wide areas in Linwood, St. Albans and Sydenham were covered by the characteristic detached timber houses with iron roof, verandah and fancy ironwork, on spacious fenced sections fronting long straight streets (Figures 3, 4, 5 and 6). These spacious houses were built from the period 1890 until World War I rather than the 1870's or early 80's,
FIG 3: GRID STREET
Long, straight, hard and linear. Man and houses pale to insignificance. Gloucester Street, Linwood. (see also fig. 6)
Wastefully wide and uninvitingly hard.
Note kerb and channel, power poles,
linearity and garage on the street. Grass
on the footpath is a-typical. Beckenham
Street.

FIG 4: STREET OF THE 1890's
FIG 5: TYPE HOUSE OF THE 1890's
Weatherboards, corrugated iron, verandahs, sash windows, high stud and a quarter of an acre of land. Kilmore Street.
FIG 6:
GRID SUBDIVISION, LINWOOD.
MAP: Dept of Lands and Survey
because problems of local administration and then depression allowed lessened standards or slowed expansion in these earlier years. But the 1890's were prosperous. Citizens could enjoy their land and the nation could afford to spare it, having plenty for all. It was once again an optimistic period when the Government could experiment with such innovative social legislation as Women's Suffrage, and when the principles of Free-Trade were succeeding very nicely for New Zealand. Christchurch could afford to be a proud, contented city in a proud, contented Dominion. Bloomfield considers the characteristics of suburban building development of this time as one of the unique aspects of the New Zealand city. Certainly the disappearance of the verandah on more recent houses would seem one of our unfortunate losses.

Another characteristic was the fence, symbol not only of possession but also of privacy - of an independent and unsocial outlook of the time. A section was a thing to retreat to for the enjoyment of life away from "people". It was also a means of shelter from the weather which prevailed - notably the chilly north east and strong north west winds.

Several of the small communities of this time became populous enough to form themselves into independent boroughs. These grew from an extension of the functions of the early Roads Boards, who had been administering the outlying districts, because the Christchurch City Council repeatedly refused to show interest in extending its jurisdiction beyond the Town Belts. Thus arose the system of fragmented local Government whose descendant problems are still plaguing Christchurch. Thus also arose some of the variations in
subdivisional standards noticed today in areas of this Period outside the old City of Christchurch. Sydenham was the largest and most progressive of these boroughs, coming into existence in 1877 with a population of 7,000 and growing to 12,000 by the time of its amalgamation into Greater Christchurch in 1903. Morrison mentions the efforts of the newly formed Sydenham Borough Council to restore order to roading in the Borough:

"Notices were served on those who had allowed gorse to overgrow streets and footpaths. The widening of narrow roads and lanes already in existence was begun, but the residents often refused to sell land for this purpose, or consented to sell only at exorbitant prices. It was an uphill fight for the Council to have even new streets made 40 feet wide, the minimum on which it had determined for the narrowest streets. ......By 1895 the Council had widened over 5 miles of narrow street, concrete channelled, asphalted and lighted them, forcing all persons subdividing to lay out wide streets, and converted six of the back slum areas into thoroughfares by acquiring outlets."

So it was not all plain sailing outside the city where local body organisation had early on been lacking. Expansion had been by private people often without reference to the needs or rights of others. Thus an early period of decline in standard of construction affected the suburbs until local councils were formed and could rally their authority. This is seen today in the narrow streets of Sydenham and St. Albans. Fortunately other problems of the time such as stagnant water in the streets, swamps into which refuse was dumped, and open ditches into which house drains were running have not survived
to the present. It would seem that beyond the limits of the planned town men were even in those days more concerned with the return from their subdivision than the creation of a fine city, and it was only once councils began insisting on minimum standards that they were adhered to. Thus the spacious norm was not necessarily true of the 1870's and had been developed by the 1890's only as a result of sustained efforts by some of the citizens. It is perhaps ironic that such narrow streets as Merivale Lane and Aikmans Road are today coming to be regarded as better residential environments than some of the wider ones.

Linwood was a third borough of this time, and has today near the junction of Armagh and England streets, near the west end of Linwood Avenue, and near the city end of Buckleys Road, remnants symbolic of the attitudes of the time. Here the wide streets cut unerringly through the old sand dunes with no changes in width, height or curbing. The natural topography is completely ignored, and hardly notices its existence. New Zealand at that time was little concerned with preservation of natural forms other than those too large to change, for the country was seeking to establish a new life in a new land. The pioneer ideal was the taming of the country to fit the pioneers' purpose and it is only 150 years of hindsight at nature lost and ecosystems damaged which has created the concern for things natural which is in favour today. It is a measure of the strength of this pioneer ideal of imposition, that it still remains so strong a part of the New Zealand attitude after 150 years.

Problems of fragmentation of Christchurch local government led to a group of boroughs joining with Christchurch
City in 1903 to form Greater Christchurch, under the Christchurch City Council. Meanwhile a further group of boroughs established themselves further out about the same time - for example Sumner (1891), New Brighton (1896) and Riccarton (1913). The late development of Riccarton is a measure of how slow suburban development was to overcome the barrier of Hagley Park and move west and northwest. From Map 1, the west and north west suburbs will be seen to be suburbs of the third and especially the fourth periods of development. Most of the outlying areas gradually joined the City - for example Beckenham (1907), Opawa (1916), Papanui (1921), New Brighton (1941) and Sumner (1945). Others still remain separate - e.g. Riccarton.

The Victorian-Edwardian Period, then, saw the real eastablishment in the suburbs of the residential standards originally proposed by the planners of the Canterbury Settlement but which had been subjugated for a time by the needs of establishing the city. Cottages of the 1870's were generally smaller and sections more cramped than the 1890's. There were experiments with other forms of housing, such as terrace housing, of which Blackheath (1877) in Durham Street South is a surviving example, and semi detached housing in Chester Street East, but these were not to prove successful. Nor were two storied houses to take on for other than the more affluent. The detached, single storied, wooden house fitted the need of the time for independence and relative cheapness, and could be fitted to any section without expensive planning, and so arose the housing form of the first hey-day of the Christchurch suburbs.
c) **Inter-War Period**

If the Victorian Edwardian Period was the hey day of the grid iron suburbs, the Inter-War Period was to become one of transition. It was a period of continued infilling of the suburbs, when the motor car came to wield its influence, when electricity came into general use, and when sealed roads became the norm in the suburbs and not only in the central city. It was the time when New Zealand began to move out of the British orbit and into the American, when Christchurch was finally replaced by Auckland as New Zealand's most important city, when the full-scale boom of the 1920's led to deep depression in the early 1930's resulting in increased social consciousness and the arrival into power of the first Labour Government. Therefore, during the period begins the Welfare State, and State Housing subdivisions begin to manifest themselves. Also begins an increase of concern for the city environment beyond the individual section, shown in experiments with methods to relieve the sterility of earlier suburbs. New Zealand begins to mature socially from her colonial past.

The motor car was to prove of major consequence to the suburbs, enabling both further spread and also infilling. Once people were not so closely tied to public transport routes the areas between the "spokes" could become convenient places to live. But just as important, the many existing wide grid streets came gradually to serve a function for which they were never intended, as routeways for motor traffic. Traffic noise and danger began, during the Inter-War Period, to cause deterioration of the living environment in the most-used streets. Petrol Stations began to appear, and garages
on private sections, to house the growing number of cars. Many garages at this time were built directly on the road frontage of their sections.

Concern began to be expressed again for the community's welfare, at perhaps a greater level than at any time since the idealistic days of the Pioneer planners of Christchurch. This concern could be taken to have been largely a reaction against the monotony of the grid iron city, which was proving doubly so in Christchurch's flat topography, and Christchurch by the 1930's was also growing big enough for the collective results of individual ownership and detached housing to begin to create its own problems. The two most important of these problems were monotony and motor traffic.

But other social conditions were on the move as well. There had been a great building boom up to the end of 1920's. In the 40 years from 1886 to 1926, the population of Christchurch increased five-fold from 20,000 to 120,000. The central city had been so over provided with commercial floor space that it was to require little more until the 1960's and the face of the inner city was to change little in the 30 years from 1930 to 1960. Secondly, some early housing was deteriorating to the stage of requiring replacement, near the end of its useful life span. Thirdly, families were becoming smaller. The average household in 1921 consisted of 4.28 people, in 1926, 4.17, and in 1936 3.90. Thus demand soon outstripped supply and more housing was urgently required by 1930, when an acute housing shortage had come to exist in New Zealand.

About 1930 the boom broke. It had lasted more or less through the 1890's with refrigerated trade, through the First
World War with its artificial inflation, and through the 1920's. 1930 to 1934 were years of low prices, unemployment and considerable hardship and these deprivations drastically changed New Zealand's outlook.

Firstly, there occurred a change from preference for free trade and enterprise to one of protectionism. Secondly there was a change in political influence from the rural and conservative to more urban and radical. Thirdly was some realisation of the dangers of too-single a concern of an individual for his own interests. Fourthly, and as a result, was a great upsurge in provision for community consciousness, which in its legislated form we have come to call the Welfare State. Fifthly, the financial havoc served as an impetus hastening detachment of the New Zealand imagination from Mother England and moving it to the United States. Bloomfield cites in Auckland the growth of cinemas as indicative of this Americanisation - the influence of Hollywood. Christchurch was probably more conservative than Auckland in this, but the effects surely filtered through as Auckland increasingly became New Zealand's most important city. This influence also shows itself in suburban architecture by a change from the European villa of 1900-1920 to the Californian bungalow of the later 1930's.

Thus the 1930's in some senses, mark a watershed in the building of the suburbs of Christchurch when she ceased enjoying the old methods and began looking for new.

The growth of State Housing is a good example of this new attitude in New Zealand. The Department of Housing Construction was formed late in 1936 as a Government effort to deal with the housing shortage. There had been State
Typical site plan. Hatched portion shows position of living-rooms. Two-thirds of the houses are single units and the remainder are two units; four units are only occasionally used in this case because they adjoin an existing shopping centre.

FIG 7: STATE HOUSING: illustrating principles of the late 1930's and 1940's aimed to improve suburban living environments, and which led to the standard housing of post-war New Zealand. Note street curvature, closure and softening, elimination of front fences, grouping of houses and planting to form spaces, concern for house aspect, controlled location of 1, 2 and multi-unit types, grouping to form communities, orientation to community open space.

Source: Firth and Wilson (1949) State Housing in New Zealand. p. 81
Narrowed, closed, curved and an attempt made to group the houses. Kawaka Street, Riccarton, built during the 1940's.

FIG 8: STATE HOUSE CUL-DE-SAC
lending for house construction since the 1890's but this new phase was more direct and intensive, in that the Government actually undertook themselves to subdivide and build extensive areas of housing. Large amounts of capital were set aside for the purpose. According to Firth (1949) housing now became a citizens right, just like sanitation and roading. Standards were to be more than just the minimum of the time. There was to be no mass production of housing or repetition of the same design. Streets were to be curved and fitted into a hierarchy of main roads between sections of the town, circulating routes for local traffic, and the purely residential. Standards were to vary according to the traffic expected. Widths were as follows:

<table>
<thead>
<tr>
<th>Main Road</th>
<th>Carriageway</th>
<th>Footpath</th>
<th>Verge</th>
</tr>
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<tbody>
<tr>
<td></td>
<td>Up to 40'</td>
<td>Up to 10'</td>
<td>If any, to allow planting of tall trees.</td>
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<tr>
<td>Local Traffic</td>
<td>24-36'</td>
<td>4'6&quot;-8'</td>
<td>4'6&quot;-8'</td>
</tr>
<tr>
<td>Residential Street</td>
<td>20-26'</td>
<td>3'6&quot;-6'</td>
<td>4'6&quot;-6'</td>
</tr>
</tbody>
</table>

Front yards were to be treated as parts of the whole street, fulfilling, therefore a double function as cottage garden and as visual property of the community. Houses were varied in setback, size and accommodation, making for every opportunity of creating communities rather than individual sections.

The Housing Division exemplifies reaction of the time to the grid-iron suburbs and ushers in the period of "intestinal" suburban layout which has been with us since - largely a softening of the rigid lines of the grid layout, with
houses still back to back and facing on to the street. It also illustrates the movement away from the individualism and possession attitude strongly favoured till that time. This movement has continued since, although it should not be regarded as more than subsidiary to the still prime belief in private ownership. Concern for the community showed itself more, possibly, in the 15 years activities of the Housing Division between 1935-1950 than in any other period of development of the New Zealand suburbs, in that it introduced the idea of street design.

Firth has the following to say about the sections themselves (writing in 1949)

"The front garden, although an expression of individual ideas, is not viewed from the cottage garden aspect alone, but as part of a large community garden, each unit being a co-ordinated part of a community whole. While there is obviously some loss of privacy under this system, particularly for those houses where living-rooms face the street, it does tend to give a more unified street picture. The sections are usually divided into two distinct areas. Trellis fences are built between the houses; hedges and chain netting fence are carried round the rest of the section, thus providing a secluded and safe playing space for children."

Besides the new idea of the importance of the street scene, the section is also being conceived more as part of the living area and some small attempt made to design for it. This trend has continued since although much housing is still being built without regard for it.

The very visionary outlook on residential design of the State Housing planners was not sustained during the next period
of suburban development. Many of the principles of the late 1940's are seen in Figure 7, reproduced from Firth's book, and many are still what is needed to day. Much has been lost as well as gained in the run down of Housing Division activities during the 1950's and 1960's. For example, these early State Housing areas achieved a certain unity of design and materials by being designed and built by a single agency. The later practise of letting groups of houses out to private contract has resulted in less harmony within the overall street.

Most of the above comments on State Housing refer to the New Zealand suburb in general, but are equally true for State suburbs in Christchurch. Early extensive State Housing suburbs were in Riccarton, Bryndwr, Dallington and Avonside. In general, however, it is true to say that Housing Division operations were less extensive in Christchurch than in Auckland and Wellington. Also, it should be remembered that while State Housing rose to prominance in the Inter-War Period and during World War II, the most extensive areas were built Post-War, and are thus part of that Period.

d) Post War Period

Since World War II there have been further large increases in the population of the Christchurch urban area, rising by between 50 and 60% in the period 1951-71. It is seen from Map 1 that there has also been a major expansion of the suburban area during this period, to accomodate not only the increases in population, but also further decreases in the average family size, and those people moved out of central areas by expansion of the commercial and industrial zones.
The surplus people from several sources have thus been moving to the suburbs which have expanded into the countryside at a great pace.

Development has been by the infilling of land between existing rural roads such as Waimari, Avonhead, and Sawyers Arms Roads, and much of it has been of the "intestinal" layout which emerged in the 1930's (Fig. 12). The flatness of the land, in not offering any discouragement to such expansion has been one element leading to the suburbs becoming a strong feature of present day Christchurch, and housing development has been a process of fitting subdivisions into the fragmented titles of rural ownership piecemeal as they have become available for sale.

An element acting to encourage suburban spread has been the increased supplanting of public transport by the private car, allowing the city increased freedom to develop away from public transport routes. New Zealand during mid 1950's ranked 2nd in the world to the United States for motor vehicle ownership per head of population and 4th for miles of road according to Ginsburg (1961). Ownership dropped to 4th by 1969, behind the United States, Canada and Australia, but New Zealand remains one of the worlds most motorised nations, and the New Zealand suburb consequently, must be amongst the least-tied to public transport of any developed nations.

The bulk of residential development since the War has been west and north west of the urban area, in the Counties of Waimari and Paparua, and in Riccarton Borough. Good dry land for housing has become scarce in recent years with the imposition of an urban fence which attempts to control suburban
FIG 9: POST WAR HOUSING
State subdivision showing softening, lightening, narrowing and curving since the turn of the century. Distant pines make an effective, if unpremeditated, focus for the street and are typical of the difficult soils of the area.

Eureka Street, Aranui.

FIG 9: POST WAR HOUSING
**FIG 10: LINCOLN VILLAGE ENVIRONMENTAL SURVEY**

**BUILDING MATERIALS BY AGE**

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<tr>
<td><strong>Totals</strong></td>
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<td>44</td>
<td>46</td>
<td>84</td>
<td>69</td>
<td>258</td>
</tr>
</tbody>
</table>

* data categories are approximate only.
* one coloured square represents one house.

Source: Landscape Consulting Service, Lincoln College.
Date: December 1972.
FIG 11: POST WAR HOUSING
Private subdivision, more affluent than in fig. 9. Individually designed houses, fewer fences, underground wiring and street trees. The heart of the intestines.
Pulford Place, Avonhead.

photo: P. Rough
FIG. 2: POST-WAR SUBDIVISION, BRYNDWR
sprawl. Thus, the more difficult low lying, poorly drained and peaty areas such as Bromley and Bexley have lately been covered with housing.

The great need of the 1950's was to provide for a further housing shortage after World War II and this period saw the sacrifice of some of the previous aesthetic standards in this quest. By far the greatest bulk of housing has been built by private enterprise, and State House construction has been in a long period of decline since the Labour Government was replaced in office by National. There has been no overriding authority to co-ordinate the piecemeal pattern of the subdivisional process.

The answer of the building industry to this problem has been to adopt relatively standardised procedures for street size and alignment, section shape, size etc. in order that whenever 2 piecemeal developments abutted, they were likely to fit together. Standardisation also served to keep down costs in such a small-market situation as New Zealand. Public acceptance was another strong confining feature, although it is a moot point as to which tail wagged which dog. However, there was a marked reluctance to build and buy anything but single storied bungalows on sections of 25-32 perches. Standards changed - for instance a lighter form of kerbing became the norm (cf. Figs. 4 and 9) - and there were differences in the patterns, as, for example, with the increased incidence of back sections, but the earlier street-house dichotomy was continued. Since the mid 1960's there have been developments in flats and town housing, and some high rise, but there have been only subsidiary to the single storied bungalows. Still the method of subdivision remained
as in the earliest days - to design a roading pattern and fit the other land uses to it.

The State Advances Corporation have met a stiff public resistance to two storied housing particular to Christchurch, so much so that the Housing Division has stopped building them. The reason would seem to be noise problems, both within the building, from inadequate construction, and from the street. The present writer lived for a time in a two-storied state built unit, one of a group of communally planned units of the 1940's in Riccarton, and would agree that street noise especially at night approached nearer to nuisance levels than in single-storied bungalows experienced. However this can be controlled by locating such uses as bedrooms, requiring quietness, away from the street.

The Post War Period has also seen a trend to decreased section sizes. The old \( \frac{1}{4} \) acre standard (40 perch) had decreased to \( \frac{1}{5} \) acre by 1960 (32 perch) and since to 23-26 perches. Consumer resistance is being felt to sections under 23 perches which suggests that this trend might have reached its limit for detached housing. The present situation is of a public willing to pay higher prices for smaller sections (say 26 perch) than larger (say 32) unless the larger is capable of itself being subdivided. It is not clear whether this is due to unwillingness to maintain the land or to current high land prices calling for every possible economy in purchase. This trend has led in newer suburbs such as Bishopdale to some incongruous results from relatively large middle-class houses being built on very small sections and whole streets have come to take on the crammed appearance
of lines of elephants balanced on sixpences far too small, visually, for comfort. The street becomes out of scale, but also the private land surrounding the houses becomes of decreased use because of its smallness and because it is usually overlooked by a neighbour or two too close to the boundary to avoid seeing over even a six foot fence. Windows inevitably end up facing each other across the fence. This is a far cry from the gracious old homes set in spacious grounds of older suburbs and not as large a step as may be imagined from doing away completely with the private section.

Since World War II a change in preferred building materials has also occurred in the Christchurch suburbs. Permanent materials such as summerhill stone and concrete block have become more used than timber. Brick has latterly almost disappeared due to its unavailability. The trend is illustrated in Figure 10 which is a comparison of building material with age for all housing in Lincoln village about 20 miles from Christchurch, which is assumed to reflect the trends of Christchurch itself. Timber is seen to have declined from being almost the sole material before World War II to be replaced by brick and summerhill stone in the period 1945-1960 and the decline of brick since with summerhill stone and concrete block becoming dominant. Other new materials have also replaced the old-Aluminium tiles or sheeting in preference to clay tiles and the old favourite corrugated iron, and concrete slab or particle board floors in preference to the old floorboards. The absence of verandahs has continued.
A currently popular trend could lead to the replacing of the standard Post War rectangular section with narrow end towards the street, by squarer sections - shallower but with wider street frontage. This arrangement offers greater freedom in house placement and use of the section, in line with another development of the Post War Period originated from the United States, the idea of the section as an extension of the indoor living space. It is also in line with the general desire to align houses for the sun.

The Christchurch City Engineers Department (1971) records a growing popularity of multi-unit dwellings since 1956, often by replacement of older inner city dwellings by groups of 2, 3 or 4 2-bedroom flats (Fig. 13). In suburban areas corner sites have become favoured locations for such units being built at the same time as the surrounding housing. However, the City Council views this as transitional accommodation for two groups without families - firstly, parents whose children have grown up and left home, and secondly, for unmarried people flatting or newly-marrieds as yet family-less. Thus the suburban house is still viewed as the norm, and as the best place to bring up a family with freedom, privacy and outdoor space, but for other groups multi-unit living proves either cheaper or more convenient. Likewise high rise and townhouse development, except that these cater for groups within more limited social levels.

Accompanying these developments, Post War Christchurch has seen increases in overall settlement densities, although these have been relatively small. Figures have increased from about 8.3 persons per acre to 8.9 in 20 odd years, largely
FIG 13: MEDIUM DENSITY HOUSING
An immediate answer to increasing property values, these units fit more people onto the land, but without much charm or efficiency.
Rossall Street, Merivale.

Courtesy ChCh City Engineers Dept

FIG 13: MEDIUM DENSITY HOUSING
This is an outline plan indicating the designated roads comprising the principal road network and the general location of motorways and proposed road improvements which are all subject to survey and detailed design.

Source: Christchurch Regional Planning Authority
by decreases in section size rather than by multi-unit development. Multi-units have tended to replace (say) 2 old family houses, each housing (say) 4 or 5 people, by 4 smaller units each housing only 2 people, and thus similar numbers of people are housed overall.

Since World War II, New Zealand has seen the beginning of attempts to control urban development by town planning legislation. The Town and Country Planning Act 1953 requires all local bodies to prepare schemes for the planning of their districts for the following 20 years. While some problems have thus been solved many others have been created by the form of the legislation and the spirit of its application. For instance, housebuilders have had to conform to rigid standards regarding house location within its section and this has led to the very same type of monotony in the suburbs which housing experiments between the Wars were seeking to cure. The attempts to answer problems of inhospitability the clash of incompatible uses, and monotony have thus not been entirely successful to date in Post War housing. Rather a new suburban monotony has arisen from the continued repetition of the new formulas without sufficient variation or structure.

Attempts to rationalise the city's traffic system have been part of this planning, as seen in Figure 14. It has involved the creation of a road hierarchy on a citywide scale, aimed to channel flows to some roads and leave others more free for other uses. There has been considerable demolition and realignment in some areas such as the Brougham Street area of Sydenham but in general the early rural roads have in the Post War suburbs become the primary roads of this
new network while the later intestinal streets have been of only local significance. The traffic requirements of Christchurch's residents are proving very demanding however, and the traffic system cannot be regarded as having been solved. Traffic is proving itself to be not easily channelled and many residential areas are still affected by nuisance from needless through-traffic.

A closer description of the Post-War street is contained in Section 2 on the Post-War "type" suburb and will not be attempted here.
4. **THE SUBURBAN TYPES**

**Introduction**

The first section of this study was based on the assumption of being able to delineate 4 periods of development of the Christchurch suburbs. It was seen that there was some question as to whether or not there was justification for making this assumption, but that it was taken as being a true enough one for that present purpose.

A second assumption will now be made on the basis of the evidence of the first section. It is that "from the visual point of view two basic types of suburb are found in the Christchurch situation." These are derived from the forms common in each of the two main periods of suburb building, the Victorian-Edwardian and the Post War. It should, therefore, be possible to identify a Victorian and a Post War "type" suburb representative of each. The former would be typical of the grid iron "hey day" - say 1910 and the latter typical of the "intestinal" form which has predominated since World War II. Suburbs dating from other periods are regarded as preparatory or transitional to the main types, from the point of view of their form.

Several flaws are obvious in this assumption:

Firstly, many subgroups become necessary to cater for the range of other variables contributing to the visual forms of their type of suburb - indeed so many as to cause each suburb to seem to fall into an individual relatively unique subgroup. Variations in social class, area in town, local soil conditions, whether early or late in the specified period, later changes in land use which might have occurred,
whether a traffic-artery or residential enclave; these are some variables and many others could doubtless be mooted. However, it suits the present purposes to maintain a more general classification such as above, and ignore such other undoubted contributory factors.

Secondly, boundaries of any type area would prove difficult to draw up accurately because change from one to the other has been more of an evolution than a rebirth, and sharp difference often do not exist. However, the Victorian Edwardian suburb remains very different from the Post-War, whatever grey area might exist between and problems of drawing boundaries can be left to a geographer.

Thirdly, there are many points of similarity between the two types postulated, and it may be that in 100 years time the two will be classified as sub groups of a bygone "low density" or "single storied" suburb. In comparison to the more diverse forms of housing overseas, both the Christchurch types are of a kind - densities, skylines, dominance of the street, relative continuity of extent. Both use the framework of pre existing major roads, both maintain the sacred cow of individual ownership, both seem to be places to travel away from whenever possible.

Fourthly, on driving around the town one would see a vastly greater number of intermediate or indefinite types than good examples of the real types. The "type" is possibly more of a mythical ideal collection of characteristics than a seen thing, but this does not decrease the value of its use.
Fifthly, the resources of the present study have not been sufficient for it to have been possible to support these assumptions with more than the most general observations. Further work may have suggested better forms for comparison.

However, despite these drawbacks, this study will continue to use the concept of two suburban "types", it being convenient and not too inaccurate for the present purposes, and there being no better expedient to hand.

a) The Victorian-Edwardian "Type" Suburb

The Victorian-Edwardian street was partly described in the previous section. Typically of grid layout, wide straight streets run sometimes for considerable distances bisecting each other regularly at right angles, disappearing monotonously into the distance (Fig. 3). The ideal width of 1 chain, carried over from the colonists, was originally a reaction to the crowding of the urban England they were fleeing. It was designed in the days before motor traffic, which makes one wonder what real uses were conceived in the New Zealand context for street of such width. For those which have become traffic arteries, 1 chain is too narrow, while for purely residential streets, it is too wide. For neither of its present groups of uses are the dimensions suitable. To a person on foot, the 1 chain street appears wide and exposed, with high moat-like gutters and power poles which appear larger than life. In a car, as mentioned, it is either wastefully wide in local streets, or disconcertingly narrow on main ones. For children's games these streets are a good size, and provided traffic is sparse enough, may be more used than any parks in the neighbourhood.
All one needs are hardy shins and a broom handle to retrieve his ball from under the gutter bridges. But in general, the size of the Victorian-Edwardian type street is too large for people to feel anything but insignificant. And that is not human.

Nor does the surfacing add any comfort. Most are asphalted full width, have generous cambers, and are lined both sides by deep U-shaped gutters, behind which the footpaths are also likely sealed full width and lined with wooden power and telephone poles. Trees and grass are usually not present within the street, and the whole scene assumes a repulsive hard grey-surfac ed appearance most uncomfortable to anyone in it.

This feeling is heightened in mid summer by the lack of shade and added heat of high-reflective surfaces, which cause an oven-like effect shunned by even the poorest-bred dogs of the area.

A third group of features add to the discomfort of these Victorian-Edwardian streets. The lines are nearly always straight and parallel - property lines at the side, kerb lines, telegraph poles, power lines. One begins to long for a good natural curve. All these straight lines converge into the distance and without anything to catch the eye on the way. It slides down the street into infinity, without any feature to focus or aim at in the distance. This especially is a problem of Christchurch, having completely flat relief. Most other New Zealand cities add the interest of hills to these straight 1 chain lines, but in Christchurch they are unrelieved, and there is less chance
of irregularities occurring, on which to fix the eye.

Fourthly is the effect of the properties lining the street. Frontages are of equal width and drawn up into straight lines like so many soldiers. Pretty poor soldiers though, each one being in different uniform. Fences and gardens are a myriad of different materials, styles sizes and colours - more like mercenaries than Scots Guardsmen. The effect is that, on travelling down the street, there are no objects of greater and lesser significance from which our minds can form some pattern, and all those houses on which so much attention has been lavished fail to create much impression. The feeling of so much display, each competing for attention adds a further distasteful note, and the whole becomes a rather confusing blur. The regularity of power poles strengthen this blur.

Next add the unpleasantness and danger of rumbling smelly vibrating lorries and buses and a further factor is added to make one feel less at home in the street. By virtue of speed and size such vehicles completely dominate pedestrians, while cars may be of equal effect being more numerous but smaller. Much such traffic is only using the residential streets because they are convenient through routes, and so undesirable conflicts of use arise.

It would seem that these streets could not be much less welcoming - they are frighteningly large, repulsively hard, monotonously uneventful, unnaturally regimented, dangerous, aimless, artless, and needlessly competative. In them, one wants to get out. Out of them on shuns having to go in - one factor encouraging use of a car for even small
trips, in that a car interior is a more secure environment than the street.

Furthermore, when seen in their context as part of a large grid system of such streets all similar, the pattern becomes confusing as well, for there are no strong signals to a driver as to which streets are for through traffic and which are not. During any journey he has to make a series of decisions as to which alternative streets to use. And there are several alternatives usually. The consequence is that all streets tend to become used as through traffic routes and the living environment suffers needlessly. The grid-iron system, not designed for today's traffic behaviour, presents insufficient hierarchy of major and minor streets (Fig. 6). Far better to channel onto some, suitably designed and leave others free — not necessarily better for motorists, with more congestion, but better for the living environment.

Likewise, the multitude of right angle intersections at regular and too frequent intervals down such streets have only become a problem since motorisation. There is no blame, or lack of foresight, but changed circumstances, but they constitute a problem no less to both the safety and restfulness of city driving. For example England Street, Linwood crosses at right angles four major roads from the city to the east — Gloucester, Worcester, Hereford and Cashel Streets. On England Street, therefore, a motorist must stop at four compulsory stops in 400 yards. The reader is invited to try this himself for first-hand experience of frustration (Fig. 6).
Another aspect not conducive to a motorist's peace of mind are the bumps he experiences as his car crosses the many badly consolidated trenches and holes sprinkled down the road. Fifty years accumulated digging, added to the fire-plugs and manholes an inch below or above the general road level cause both discomfort and jarring to the traveller and wear and tear on the car.

So, to the person travelling in a car, not only is the Victorian-Edwardian street uninviting and visually uneventful, but the collection of such streets into the Victorian-Edwardian suburb makes his journey confusing, uncomfortable, dangerous and rather alarming. Any journey, far from being enjoyable, becomes rather a trial, holding in store few of the surprises and little of the pleasure of being in places that "feel" right. I suspect that this alienation is a major cause of the aggression so often displayed in city driving - not the only cause of course, but it would seem likely that were the surroundings more restful, so in general would be the motorists reactions.

The motorist may choose to park his car and walk, but even this will cause him difficulty. Firstly, he will have to navigate the little asphalt ramps leading to each gutter crossing (Fig. 4) in search of a stopping place, and secondly, once stopped he will have to fight and struggle to push his door upwards to open it against the steep camber, clambering upwards to get out while having to hold the door up. On the other side his passengers door will have fallen open and dug itself into the high curb. No wonder taxi drivers choose to draw up by gutter crossings rather than on such cambers. Both camber and gutter capacity are more than
needed for Christchurch.

A comment about the suburbs of New Zealand cities in general, but especially relevant to Christchurch, and to the Victorian-Edwardian aged suburbs: they are restless. They contain few spaces which attract one to tarry. Rather, one's eye is continually drawn on, around the next corner. Obviously this partly results from the streets' function as a corridor for movement, but partly it reflects also the generally restless nature of the New Zealand way of life for this is what gives rise to much of the movement. This restlessness in an acceptable characteristic for a traffic street but few of our streets are required to be merely this, and it is possible that there has come in the New Zealand suburb to be too great a discouragement, as a result, to the many other functions which streets perform in other societies - the promenade, the market, the meeting place, sportsfield, creche, workshop. We New Zealanders, pragmatists all, see a street as a corridor for the movement of vehicles, and have tried to make it efficient for that purpose - surfacing, drainage, visibility, parking, traffic lights, turning circles - a whole host of concerns. Streets have become regarded very much as single-use areas and we would strenuously defend our right to travel when and where at will, a right equal in importance in New Zealand to the right of ownership of land. So, with the typical New Zealand conception of things as black or white, the street has become a corridor for the exercise of restlessness. Other possible uses have been strictly segregated. - To play we go to a park, to sleep we go home, to dance we go to a hall, to laugh we get somewhere private. It is not proper for a New Zealander to be born, live or die
in the street, only to hurry, and that efficiently. The Victorian-Edwardian street has been specially vulnerable, being invariably a through street. All the other functions have become subjected to endure the passage of needless through traffic. This was recognised in the 1930's when the first real attempts to create a street hierarchy were made, in answer to traffic increases. The cul-de-sac and local street are examples of this reaction, but the form of the old grid street still reflects the restlessness. The complete dominance of hard, grey surface, the inhuman sized objects such as power poles and lorries, the sheer size, the high gutters, the strict use of straight lines for all boundaries and curb lines, the lack of by-spaces and relief from the general pattern all discourage a person from being at rest. He doesn't feel at home there, and he doesn't feel good. His only alternative is to keep going in hope of finding somewhere.

Which brings us to a further characteristic, not exclusive to the Victorian-Edwardian suburb, but finding perhaps the hey-day of its expression there—possession. People could endure the alienation of the streets because they knew they led to the private sections where they could feel at home. They knew that there was lawn and trees and a fireside chair which they could possess and enjoy. Therefore the street didn't matter. The consequence has been to reinforce the streets physical alienation by another implied one of being unwelcome to cross those lines onto everyones private domains bordering the street. Stern fences maintain this principles, and any unfortunate without a home to go to could be excused for feeling an undesirable. The
importance of each New Zealanders home section should not therefore be overlooked. The result has been a vicious circle, the importance of home being increased because the street is an uncomfortable place, which in turn decreases concern for the street and its capacity to attract.

Possession of land is one of the deepest values in a New Zealanders thinking, along with the profit motive. Its future has been ensured by it being so deeply written into our laws and procedures. Freehold still is one of the criteria entitling a local body vote, and plural voting, while many of the oldest of our laws are to do with trespass, and damage to property etc. For example the doctrine of nuisance protects a landowner from unlawful interference to the use or enjoyment of his land. This is a far cry from the land laws existing in Maori times before European settlement. All land was then owned collectively by a tribe, and although there were rules about its use, no one possessed it to the exclusion of his fellows. Maoris today view our fragmentation of the land with a mixture of sadness and contempt and although they have to join in, it seems to them like so much rape of mother earth. Not that alienation didn't occur when a tribe was defeated in combat, but it was a community alienated, not individuals as today.

The importance of private land has led to a negative attitude to the street in New Zealand. It is a utility, enabling us to transfer from one place of action to another. It is not a place where life is expected to be carried on, but a necessary interlude where life is suspended, as it were, between acts. Thus, life is not sought nor expressed
nor experienced there. The street becomes the land we have the right to walk on, but don't want to acknowledge any responsibility for. It comes to assume connotations of unpleasantness. Rudofsky (1971) calls American streets "the entrails of the American city," certainly a more expressive and probably more correct description than Geddes' "arteries of the city."

It was mentioned that there were experiments with other forms of housing in Christchurch, such as the row of terrace housing in Durham Street South. However the detached wooden bungalow with iron roof and its own section became the norm for the Victorian-Edwardian suburb. There were two reasons. Firstly, and once again, the old demand for independence. Here one could plant the house of one's choice on the section of one's choice, and have some feeling of having an individual result. One could choose one's own builder, or build it himself. Here was the greatest freedom of choice over the greatest possible range of the decisions made in building a house. Secondly, cost. A detached bungalow was the cheapest way for an individual to house himself while acting independently. It required the minimum of planning of the house-section relationship, and for neighbours, sun, wind etc. Merely choose the plan and apply it to the section. "Planning" of the section entailed making the best of the result after it happened, and while the good ones were undoubtedly very gracious and livable, the bad ones were very bleak, Relationship of house to section was often unsympathetic, and the section as a result not fully utilised. The old verandah often saved the situation by providing a sheltered sunny spot as a centre of outdoor life,
unless it happened to have ended up being built facing south. Foundations were usually high - at least a foot, for ventilation, further divorcing indoor space from outdoor.

Outbuildings arose - first the privy, woodshed and washouse, later the garage and specialised buildings - workshops, sleepouts, ham radio shacks and the like. These ¼ acre sections provided ample space for an individual's industriousness - to work on his car, build a boat, operate a ham radio set.

They also provided ample space for nature - trees, and lawn, sunshine and flowers, vegetables and birdbaths. Christchurch became known as "the Garden City" on the strength mainly of people's efforts on their own sections. Within 10 years of settlement trees were beginning to form the skyline of the initially treeless Plains and by the turn of the century not only the suburbs, but also the rural areas were well treed, mainly on private land. The wooded appearance of some suburbs of this age, for example Merivale, is the result of private effort. Thus the relief from the harshness of the streets.

Thus also, growth of the social value of domestic industriousness - be it gardening or washing clothes, mowing lawns, do-it-yourself carpentry, dusting, dressmaking or fixing the car. Here there was the space and privacy to make efforts possible and worthwhile. For a New Zealander it has become preferable to be so occupied than to follow such "lazy" pursuits as a siesta in the sun or playing mah jong. This belief is basic fuel for the national restlessness mentioned previously, although it has probably become a more aimless
or hedonistic pursuit over the last generation, as security has been achieved.

A further result of the section has been growth of the cult of property display - of neighbours competing with each other to have the "nicest" house or garden. Hence gnomes, butterflies and silver balls.

Thus, the principles established for Christchurch by the Victorian - Edwardian suburbs: the right to use a street; an inherited notion that streets were "good" and therefore deserving of certain minimum standards of dimension, surface etc; this notion outweighed by a strong belief in the individuals own sections; therefore, a lack of any real concern for the street as anything more than a utility; the fence as policeman of private ownership; the detached wooden bungalow; private gardens and lawns; the independent family; the right to privacy; power poles; the concept of a compartmentalised life; lack of connection of house to site; space for family life and do-it-yourself industry; enjoyment of the outdoors and fresh air; the housing following the roading in subdivision; display.

A three-fold concept of the suburb seems to have emerged - the suburb itself, the street, and the individual section. In general it is probably fair to say that it was on the level of the individual section that the New Zealand and Christchurch suburb was most successful in uniting social aspiration with the physical setting. This would be true of both "type" suburbs, but especially so for the Victorian-Edwardian one. Most effort went in here, and here were the least conflicts of purpose.
It was claimed early on that the Victorian-Edwardian suburb marked the hey-day of the individual section in New Zealand. This is not to say that individualism is not today still of great importance, but rather that there has been a steady decline in it in New Zealand since the 1880's. This is marked by a steady decline in the proportion of New Zealanders who are self employed or owners of businesses, and increases in the proportion of wage earners. Belief in individual freedom is still important but since the 1930's, community-oriented legislation has come to compete in importance. For instance, the growth of town planning laws. This is the reason for assuming the Victorian-Edwardian period as hey-day of the individual house. Since then it has been eroded from all sides - size, freedom, privacy, the quality able to be afforded. There have been changes of life style, outlook, economic constraints, and the individual section has become modified into several more specialised forms. There has also been an increasing readiness to consider other less-individual forms of living, such as high rise and flats.

b) The Post War "Type" Suburb

It has already been discussed how a different street form arose in the inter-war years in response to some of the problems of the earlier suburban forms, and how the new forms became the standard for subdivision after the 1940's.

However, one basic thing was not changed - the subdivisions still remained road-oriented. By this is meant that the land was cut up by the drawing in of roads, so as to enclose usable parcels of land and meet at the right places, and
then to cut up the parcels for housing sections. Also, the exercise remained a two-dimensional one, where the planning was done on a map, mainly for functionality, and with little attempt to create in the third dimension spaces, enclosures sequences etc. Finally, the process of building on these subdivisions has remained too individual-oriented for much third-dimension design to be considered.

Change in the road form is one of the key factors in the difference between Post-War and Victorian suburbs.

Firstly, the view down the street was closed, by curving the alignment (Figures 9 and 11). It took some experiments before satisfactory curvatures were settled upon, and many streets of the 1950's are now considered rather awkward, their curves being too tight, or the combinations of straight and curve being visually bad. These are relatively well treated now, however.

Secondly arose a policy of consciously designing T intersections rather than cross roads, to reduce driver conflict.

Thirdly a form of road hierarchy was introduced, with major roads usually carrying over from pre-subdivision times, infilled by local residential streets. The former are of course all through-roads while amongst the latter grew the practise of creating blind streets to eliminate through traffic. The engineers learned early on in the 1950's to limit the length of any blind street to that which enabled it to be easily seen from the entry to be blind, because it was found that significant amounts of traffic otherwise turned in by mistake. Thus evolved the cul-de-sac characteristic of the Post-War suburbs. Many of the local residential streets were
retained as through streets because they acted as feeders for the arteries, but the hierarchy was extended to them by building them narrower than the major roads. The latter continued with the 1 chain (66 feet) road reserve of the grid streets, with minimum kerb to kerb width of 42 feet, but any streets which were mainly residential were narrowed to 54 feet boundary to boundary and 42 feet kerb to kerb. These latter were sometimes further narrowed to 48 and 24 feet respectively in early state subdivisions (e.g. Figure 8) but found too narrow and discontinued for through roads, although they are still held satisfactory for shorter cul-de-sac. The criteria for a local roads width in Waimairi County at least was whether or not it was to be used by buses. If so, it was built to arterial road dimensions, if not, to residential ones.

A fourth change in the Post-War streets was that they were considerably softened by the inclusion of grass and planting in the road reserve (Figure 11). This has led to its own new set of problems but the generally softer street which resulted is vastly more agreeable in a residential area than the asphalt deserts of the early grid streets. The effect of the green has varied with the class of road, being least on the widest roads and most on the narrowest, because they all maintain a standard 12 foot footpath width, which is therefore a lesser proportion of the wider roads than narrow ones.

Allied to the softening was an increased locating of services and wires underground in standardized corridors of the road reserve. The road thus was relieved of most of the poles and wires of earlier suburbs (Figure 11).
It must be remembered that many Post-War streets are still endowed with poles and wires - there was, rather, a growing proportion with underground cables, until most are so today.

Treatment of the green space often left much to be desired, however, because of the limitations the services imposed. Only small residue strips were left for street planting, which could only be, therefore, small trees such as prunus or malus. This combined with a tree selection technique which ignores both the soil and microclimate conditions of the particular site, as well as the visual effects required of any trees there have led to rather inadequate street planting in the Post-War suburbs according to Boffa (1973). Certainly the planting has softened the street, and unifies it once grown, but the results are very monotonous with uniform spacings, size, types repeated down the street length. Boffa comments that such planting emphasizes the streets linearity. Also, many trees are unable to thrive in the conditions in which they are located because, for example of a pocket of especially free-draining soil at that point, or because the topsoil was removed during construction. The effect of such struggling trees on the street appearance can never be as effective as it needs to be.

A further softening factor, by no means universal, but
FIG 16: UNDERGROUND SERVICE LAYOUT IN TYPICAL RESIDENTIAL STREET.

TELEPHONE & POWER CABLES - Both sides of street; prefer minimum burial of 1/6" (phone) or 2" (power). Deeper burial of power is function of greater danger if penetrated (eg by spade). Preferable separation of 1/6" for straight alignment in case of safety in later trenching. Phone & power can share a trench if power is less than 250 volts. Grey plastic telefoons mark feeders to individual houses, for telephone.

WATER SUPPLY - 6 - 9" pipe for local street one side only (main), with 2 - 3" sub or either main feeding opposite side. 1/6" burial preferable. Sub main often requires digging up. Cast iron "mushrooms" mark lines to private houses.

GAS MAIN - Located wherever convenient, preferably but not always on the footpath.

TELEVISION CABLE - Not in NZ but space has to be found for them in the footpath in Britain & the United States. Near low tension power cables to the gas main in one British example (Daily, 1972)

STREET TREES - Must therefore be fitted to space between water main & kerb.

DRAINAGE - Storm water & sewage kept separate for health danger otherwise of sewage overflowing after heavy rainfall. Foul sewer centred in carriageway. 8" or 12" pipe. 4 to 6" pipe services each house, with minimum gradient of 1:50 or 90, & minimum burial of 12" at house. If less, must encase the pipe in concrete. Standards vary with type of pipe in use, eg clay or asbestos.
which has grown more common in Post-War years is the absence of a front fence. Home owners seem to have become more flexible than they were in 1900 regarding the need for privacy. Thus greater visual amalgamation of the street and private properties occurs (Figure 11). That this is by no means universal is seen from Figure 9, but at least it is a move in the right direction.

Street engineering has also contributed to the softening process. The disappearance of poles and wires was one thing. But the lightening of the early heavy U-shaped gutters was another, now replaced by the form seen in Figure 9. The earlier cumbersome gutter crossings are thus eliminated, to the benefit of both road users and taxpayers and although flooding may occur with slightly increased frequency, it occurs so seldom and is of so little import as to be no great price to pay. Visually the result is a much more unified, or rather, much less disunified street. Road cambers are another similar factor. Where in the Victorian street these were generous to ensure efficient drainage, often approaching the level of discomfort for motorists, they are in the Post War street lessened to angles between 1 in 24 and 1 in 32, and form both a more comfortable and less divisive street.

A final word should be said on Post War street layouts. It was implied that they are all curving, but a glance at the map will show many straight streets as well, all be it culminating in curves. The pattern includes curves, and is therefore different from the general grid street, but it also includes many straight stretches.

In the private section, the Christchurch suburbs have similarly been considerably modified in the Post War period.
Firstly, sections have grown smaller. The old standard $\frac{1}{4}$ acre, although never universal even in earlier times, has been replaced by $1/5$ and latterly $1/6$ acres since the 1950's.

Secondly, sections are now often of more variable shape than before. Fitted around the curved road pattern, there are fewer right angles, and some of the traditional rectangles are now trapezoid or triangular (cf Figures 6 and 12). There is a current favour for square sections also.

Thirdly, with the more variable street pattern, there has been more call for rear sections served by right-of-ways. These existed earlier, but much less frequently.

House styles were considerably lightened and lowered after the arrival of the Californian bungalow in New Zealand in the 1930's. Cost-cutting has caused the disappearance of many decorations and extras such as verandahs and fret work. Changing availability of materials saw the changing preferences for building materials which was mentioned earlier. Stud heights were lowered to decrease the costs of materials used and heating, layouts were rationalised and pruned to the efficient forms of today, and accommodation became relatively standardized at 3 bedroom, 1 or 2 living rooms, no or a small hallway, etc. Garages were moved back from the street front-age, usually to behind the house or else incorporated into the house. Houses remained, as earlier, mostly single-storied. Windows became larger, chimneys lighter, and wide doors to the outside became more universal, along with terraces and patios. It is, however, debatable whether more outdoor living occurs on them than on the old verandahs of the past. Many patios are ill-sited for their purpose, and are probably
largely intended to be decorative.

Gardening styles have changed with a decrease in favour of bedding plants and annuals requiring a high degree of maintenance. They still exist, but gardens now are more commonly of shrubs than flowers. Large trees are not commonly planted, or rather are removed or butchered once they begin to approach maturity or get within 10 feet of an overhead wire. Planting is usually for screen purposes bordering the property to increase privacy between neighbours and from the street.

The Post War period has seen the advent of town planning legislation, and the first round seems to have resulted in standardization rather than improvement of the environment. Admittedly, much standardization has probably also been due to economic factors, but layouts have typically been influenced by the planning ordinances. These have served to protect residential areas from such so-called undesirable uses as industrial and commercial buildings by weeding out non-conforming back yard enterprises and cottage industries where these might affect neighbours. Similarly, they have served, by setting out minimum yard requirements, to standardize layout of houses on sections, because the minimums have been taken, rather, as the norm as a result. House setbacks are often monotonously unvaried down the street, and houses forced by side yard requirements to orient to the section or street rather than the aspect. The suburban scene has been standardized and increased in monotony in some respects by the town planning controls.

Despite the improved hierarchy of roads, improved street appearance, the advent of planning controls, and improvements
in the houses, the nett result of the Post War suburb in Christchurch is still a rather confusing one, although a different type of confusion from that complained of in the Victorian suburb. The cause is the difficulty an individual finds in orienting himself. Commercial centres exist as suburban nodes to give some focus, and the framework of old pre subdivision roads also give the terms of reference amongst which the "intestines" (Rudofsky (1971) calls them "entrails") are laid. However, the effect of large areas of "intestines" all relatively standardized and with identical houses, allied to the sinuous route a traveller follows, often leads to people losing their sense of direction. Even to someone familiar with a particular area there is a strong lack of signals as to just which suburb he is in, and where it ends and the next begins. Even the shopping centres dont know where they are. One shopping centre in the north west has three shops side by side labelled "Merrin Post Office", "North Avonhead Pharmacy" and "Russley Supermarket". The major roads such as Riccarton, Fendalton and Ferry act in part to divide the suburbs into units, as do major visual divides such as Riccarton Bush. However, Post War planning has been unable to have much effect on definition of the suburbs of Christchurch.

The Post War suburban fabric is thus still too homogeneous and amorphous as in the portion seen in Figure 17. It is in need both of further definitive barriers and boundaries, be they arterial roads, belts of large trees, or etc. and of further definitive nodes to act as central attractants, which are likely to be the shopping centres. These limits and nodes need to be structured into a similar hierarchy to that being
The roofscape of post-war Christchurch, disorganized and uninterrupted save for the trees of an early homestead surviving in the distance. View to south east from Ilam University buildings over Upper Riccarton and Middleton Grange. Open country of the Wigram and Halswell districts beyond.
constructed in Christchurch for the road system, and are further discussed later.
I journeyed to London, to the timekept City,
Where the River flows, with foreign flotations.
There I was told: we have too many churches,
And too few chop-houses. There I was told:
Let the vicars retire. Men do not need the Church
In the place where they work, but where they spend
their Sundays.
In the City, we need no bells:
Let them waken the suburbs.
I journeyed to the suburbs, and there I was told:
We toil for six days, on the seventh we must motor
To Hindhead, or Maidenhead.
If the weather is foul we stay at home and read
the papers.
In industrial districts, there I was told
Of economic laws.
In the pleasant countryside, there it seemed
That the country now is only fit for picnics.
And the Church does not seem to be wanted
In country or in suburb; and in the town
Only for important weddings.
What life have you if you have not life together?  
There is no life that is not in community,  
And no community not lived in praise of GOD.  
Even the anchorite who meditates alone,  
For whom the days and nights repeat the praise of GOD,  
Prays for the Church, the Body of Christ incarnate.  
And now you live dispersed on ribbon roads,  
And no man knows or cares who is his neighbour  
Unless his neighbour makes too much disturbance,  
But all dash to and fro in motor cars,  
Familiar with the roads and settled nowhere.  
Nor does the family even move about together,  
But every son would have his motor cycle,  
And daughters ride away on casual pillions.
We build in vain unless the LORD build with us.
Can you keep the City that the LORD keeps not with you?

A thousand policemen directing the traffic
Cannot tell you why you come or where you go.
A colony of cavies or a horde of active marmots
Build better than they that build without the LORD.

Shall we lift up our feet among perpetual ruins?

I have loved the beauty of Thy House, the peace of Thy sanctuary,
I have swept the floors and garnished the altars.
Where there is no temple there shall be no homes,
Though you have shelters and institutions,
Precarious lodgings while the rent is paid,
Subsiding basements where the rat breeds
Or sanitary dwellings with numbered doors
Or a house a little better than your neighbour's;

When the Stranger says: 'What is the meaning of this city?
Do you huddle close together because you love each other?

What will you answer? "We all dwell together
To make money from each other'? or 'This is a community'?

And the Stranger will depart and return to the desert.
O my soul, be prepared for the coming of the Stranger,
Be prepared for him who knows how to ask questions.

T.S. Eliot - chorises from "The Rock" (1934).
MAP 1:
CHRISTCHURCH URBAN AREA:
GROWTH

Built-up area, 1866 (pop. 12,000)
- - - 1886 - 20,000)
- - - 1926 - 120,000)
- - - 1946 (est. 160,000)
- - - 1966 - 250,000)

Styx Mill Study Area.

SCALE: 1 mile to an inch
NORTH: vertical
SOURCES:
a) City of ChCh Residential Urban Renewal Report.
BASEMAP: ChCh Regional Planning Authority.
MAP 2:

CHRISTCHURCH URBAN AREA:

RECONSTRUCTION OF
GROUND CONDITIONS
OF THE 1850's

Sandhills
Swamp
Riverbed
Native Forest
Styx Mill Study Area

SCALE: 1 mile to an inch
NORTH: vertical
SOURCE: early maps, courtesy Dept. of Lands & Survey, ChCh.
BASEMAP: ChCh Regional Planning Authority

note: all boundaries are approximate only.
information suspected incomplete for Riccarton area.
MAP 3:
CHRISTCHURCH URBAN AREA:
SOILS

S  |  Te Salwyn
T  |  W Te Kahahi
W  |  K Waimakariri
K  |  Ti Kaiapoi
Ti |  W Taipu
W  |  Waimairi
W  |  Templeton
K  |  Eyre
T  |  Wakari
E  |  Tema
M  |  Kir Waimairi
K  |  Kaiapoi
R  |  Karaka
K  |  Waikuku
A  |  Aranui Complex
W  |  Malutaramu
M  |  Horolane
H  |  Hill Soils

AREA:
1. Sand
2. Loamy sand
3. Sandy loam
4. Fine sandy loam
5. Silt loam
6. Heavy silt loam
7. Peaty loam

SCALE:  1 mile to an inch
NORTH:  vertical
SOURCE:  Soil Map of ChCh, 1965, Rennie &
         Rennie, unpublished map by Soil
         Bureau, D.S.I.R.
BASEMAP:  ChCh Regional Planning Authority
DRAWN:  G.H. Demo, October 1973

note: this map is conceptual only, and subject to
      refinement by the authors.
5. DIRECTIONS FOR THE FUTURE

The material covered thus far has been mainly descriptive of the Christchurch suburban scene - not especially visual, but seeking to mix the physical attributes, human values, history etc. which make up our reaction to the suburbs at the present time.

The aim now is to attempt to derive directions for future designs according to those values and needs noted which are deemed valid, in order to improve the visual scene. The discussion will continue to use the three levels of suburban scene already established - the individual section, the street and the whole suburb.

a) The Individual Section

It was said earlier that the Christchurch suburb had been most successful at this level, providing the freedom and individuality demanded by the residents. However, several inadequacies are still obvious:

lack of privacy of both sight and sound within the section

poor wedding of house to site

inefficient utilization of section.

Privacy is lacking firstly from the section being open to outside view. It was commented earlier in connection with state housing, that street gardens should be open in order that they become part of the street. While this is desirable, it must be balanced against the need for privacy, and a decision made for one or the other. If other areas behind the house can
fulfil the private living requirement then the street side should be designed as open space for public benefit, and houses designed to suit. However, if a private garden on the street side is necessary then privacy should be maximised by high fencing. Areas used for outdoor living should not be exposed to public gaze, and while the high board fence common in housing of all ages in Christchurch has provided tolerably well for this requirement some areas are almost devoid of both inside and outside visual privacy on the section. In some of the state housing areas such as Aranui privacy is non-existent for this reason and in other privately developed areas such as Bishopdale it is often severely intruded on because neighbouring houses overlook the yard. This is a direct result of the smaller size of sections and of houses close to boundaries having not been designed with windows in suitable places. Lack of adequate walling constrains the range of outdoor activities the resident feels free to indulge in, while too much divorces the sections from the street.

One solution to this problem is to completely wall the back yards and keep the front open. Both areas then fulfill their functions well, and scope is left for variation to the pattern. (see Figure 18, over).

Lack of privacy from noise is a worse problem, for even with a 6 foot fence suburban house construction and placement is such that little damping occurs. Much neighbours noise is transmitted to adjacent houses and sections. Wooden floors above the ground act as sounding boxes and transmit thumping through the ground, while windows and thin walls facing each other only 10 or 15 feet apart allow direct transmission of conversations, music, bathroom sounds and the like.
Such a policy would also tend to decrease the inevitable staring across into neighbours windows which results when houses face each other across the fence. Indoor eye-level is usually higher than even a 6 foot fence top and awkward moments can arise when we absent-mindedly stare out the window and into the eyes of the neighbour suspiciously watching. Increased use of lower, concrete slab floors would lessen this last problem as well as the sounding-box thumping.

Poor wedding of house to site is often necessitated by the section itself if little alternative building orientation and location is left between yard requirements and section size and shape. There may be little chance to create sheltered, attractive or useful spaces on oblong-shaped sections, for instance, where the width within the sideyards is little more than the width of the house being built. Some sub-dividers or builders also contribute to such problems also by preferring a geometrical or section-aligned location, rather than one aligned for sun, wind or neighbours windows.

The common high foundations and timber floors also act against the wedding of indoors and out—not making it impossible, but rather, less likely to occur without being planned. The break between floor and ground requires definite designing for proper integration. Hence one of the reasons why the disappearance of verandahs on more recent housing can be considered a loss. They provided an ideal "half-way house" between the in and out of doors. Concrete slab floors enable an easier relationship of house to section, being lower to the ground.

These are not new ideas. Figure 20 illustrates the point from a New Zealand publication of 1947, and some of the
Noise can be controlled by two means—screening, e.g., thicker and windowless walls between adjoining neighbours, and channelling, e.g., with projecting ends to lessen sideways transmission:

**FIG 18: PRIVACY ON SECTION FROM WALLING**

from Simonds Landscape Architecture pp 97-100.

**FIG 19: NOISE CONTROL BY SCREENING & CHANNELLING**
Victorian era houses did indeed sit nicely on their sections. However the problem has increased with the decrease in section size which has occurred this century.

Utilisation of sections is inefficient partly because of their shape, partly because of poor house design for its location and partly because of unplanned section layout. At least one of the side yards is commonly waste space, often a deadend visited only for lawnmowing and children's hide and seek. They are perpetuated by the regulations and are quite needless in many cases were we willing to design for a specific situation. For instance, even the standard present-day houses could often abut quite satisfactorily along common brick or concrete block sidewalls. More use of skylights might need to be made, but one of three following benefits could accrue:

The larger space left on the other side of the section could be more useful;

a larger house could be fitted to the same section;
sections could be narrower with little loss of utility and possibly enabling more sections per road frontage.

A higher degree of prior design would be required to ensure the relationship between neighbouring buildings, and while this would be quite possible for group builders under even the present system, it could also be achieved by council ordinances acquiring common walls and specifying building envelopes. If envelopes are drawn up for each section, within which the owner can build, and if his house is required to have a common wall on a given side, and have no windows that side, houses could still be erected independently, but with possibly more regard for each other, and certainly with more economy of
FIG 20: INTEGRATION OF SUBURBAN HOUSE AND SITE, 1947:

illustration of principles by E. A. Plishke, architect. An example of the period of interest in suburban environment in New Zealand before and immediately after the Second World War.

Source: E. A. Plishke (1947) Design and Living. p. 41
The section shape in Christchurch has traditionally been rectangular, with the road frontage on the short dimension. A recent trend towards squarer sections has begun to manifest itself. More roading is required to service a given number of sections, but within the sections themselves greater freedom results to vary the design, orientation and location of the building thereon. This is expected to be a popular trend although it is to be hoped that it is followed in combination with other shapes of section as well, so that a variety is offered.

The suburban house in Christchurch has been strongly tied to a single level, probably because construction is cheaper while the houses can be more convenient without stairs. This has been possible with cheap housing land freely available but may change to a degree from now on. No longer is land cheap or freely available. Also 1973 has seen the passing of the Unit Titles Act which provides for secure ownership of multilevels on the same area of land. Perceptually, it is seen as an extremely important change in the Christchurch...
suburban scene to add the variety of living on more than one level, and the greater enclosure of outdoor spaces by taller buildings, to the monotonously flat city fabric. Story-and-a-half, two, two-and-a-half and even three storied housing could fit quite well to the suburban scene in appropriate places. This will be discussed further in the section following, on the street. Here it is sufficient to encourage houses to be built more commonly of more than one story, giving variety of outlook both out of and within the house. Design is required, of course, to minimise intrusion into neighbours privacy, which would be more with two stories, but it should be possible at least in theory to design windows not to overlook side boundaries, or to screen sideways views by various methods.

Besides monotony of levels, it is also suggested that there exists an unnoticed problem of monotony of spaces both inside and outside. Housing since the 1930's has had relatively standard stud heights, and room size continually being honed for economy. Suburban homes have come as a result to offer little variety in the spaces experienced. In daily life suburbanites have come to expect few strong emotions of awe or containment at unfathomably misty heights or solid pressing ceilings. Our space containment is extremely predictable and although it means we don't anymore have to stoop under low beams or bang our heads on steep stairways, it is also an area of interest and variety removed from suburban life. Similarly, outside spaces lack variety, be they back yards or streets. All are relatively similar and predictable.

It is interesting to speculate whether or not a general lack of imagination, perception, reaction and flexibility results
in people who become tied to the perceptual habits of suburban spaces, for it would seem highly likely than the long term result on the community's vitality will be to dull it. Emotions will only be expressed where they are felt, and only be felt where the senses perceive their surroundings strongly. Anyone who has lived long enough in any non-suburban form of housing such as a student hostel to consider it as home will surely feel the significance of this point.

Other points regarding the suburban section bear little more than mention.

One is the problem of maintenance. Once it was a matter of pride to keep a tidy section, but the multitude of calls one experiences on one's time today has served for many people to make gardening more of a burden than in the past. Indeed smaller sections of 23 or 25 perches are selling easier at the moment in Christchurch than "larger" 28 or 30 perch ones, presumably for this reason. It has also led to the popularity of such "easy care" devices as pebble gardens, sawdust or concrete surfaces, and more natural styles of planting e.g. the shrub in preference to the bedding plant.

Also could be mentioned the general naivety and lack of subtly about the decoration and display of some sections, e.g. with the oft-decried butterfly and silver ball, rainbow colours amongst the block work etc. These give a good appreciation of one level of aesthetic taste in Christchurch.

Because of its independence and versatility the detached house and independent section is likely to remain a popular form of housing for many years to come, and one difficult to surpass for a family bringing up children. It is not realistic
to assume that Christchurch a generation from now, won't be spread over a much greater area than at present, nor that almost all of this spread will be anything other than low density detached or semi detached housing akin to present forms. What needs investigating is firstly ways to improve the functioning and appearance of the coming suburban housing; secondly, ways to diversify the forms of housing available so that those groups of the population not wanting or needing the land around a suburban house can still enjoy a homely living environment with less wastage of the city's resources; thirdly, and beyond the scope of this study, the distribution of these forms throughout the city.

The first step is to list the advantages of the existing suburban house and section both real and imagined, for no alternative forms can hope to be acceptable without providing for some of these:

**Private ownership:** allows people to own their own home and be independent of the vagaries and financial connotations of landlord and paying rent.

**Planning and building:** people can choose the details of the design and construction of their homes, its location etc. An important feeling of independence is gained, although it is debateable just how much, considering the scope of choice available. It would be an interesting exercise to determine just what proportion of new houses are built, finished and sold on spec.

**Garden:** enjoyment of the industry and fulfilment of planning and tending it - enjoyment of one's own private
piece of nature around the living space i.e. green grass, trees, and a very important if perhaps misunderstood feeling of being in contact with the land.
- production of household needs e.g. by vegetable garden, grape vine.
- amelioration of the climate around the house e.g. shade and moisture in summer heat, drainage.
- introduces the child to his own private world of nature study. Beetles, bees, flowers, leaves, worms, insects, birds, plants and soil are all observed and experimented with in the course of his play, often the most meaningful contact he will have in his lifetime, without the social pressure of other children.
- an area available to set up as ones own private display to the street.

**Open air:** enjoyment of a private space to get out of doors and breathe fresh air.
- use for children's playspace, being enclosed and suitable for less supervision than a public area
- sandpits, lawn, trees to climb, playhouse, paddling pool and hose.
- private outdoor recreation - sunbathing, putting green, barbeque, swimming pool, tennis court, parties.
- natural drying and airing of clothes, bedding etc.
- a chance to sleep outside during summer nights etc.
- i.e. as a change from the house.

**Space:** Such do-it-yourself pursuits as car repairs, glasshouse, carpentry, boat building, radio "ham", bonfires, compost heaps can be carried on without interference.
- Pets can be kept e.g. goats, guinea pigs, hens, sheep, rabbits.
- Possessions can be stored or sheltered e.g. garage for car, sheds for bicycle, rubbish bins, gardening tools, general junk, caravans, boats, trailers.
- Allows for greater flexibility of accommodation with space for tents or caravans when the house is full.

Privacy: is implied in most of the other categories mentioned. Theoretically we are protected in sight, sound and access from neighbours and strangers (fences) and other members of the family (e.g. outdoor "dens").

Street: property owner has the choice of creating outlook to or separation from the street and passers by.

In other societies many of these functions are provided for and carried on quite satisfactorily in public places, but New Zealanders are closely attuned to a dependance on privacy as one of their rights, and are unable to be comfortable without recourse to it at times. Thus it is not reasonable to propose housing which does not cater generously for privacy in Christchurch. Socially, it would not work. Therefore this need has to be balanced against the community's need to economise on space, and the crux of any design solutions in housing lies in the successfulness and subtly of the mix of these two.

Thus, the following proposals are put forward for the individual section:

1) To design house and section as a unit, and at the same time
2) To increase use of the verandah once more
3) To increase the practise of building up to side or rear
boundaries, and sometimes front boundaries, with necessary standards of common wall construction.

4) To develop better relationship between neighbouring buildings in the visual and spatial sense, through new forms of size, location and type controls on subdivision and construction.

5) Encouragement of 1½, 2 2½ and 3 storied suburban housing.

6) More use of more substantial walling, to improve privacy.

7) To encourage the giving over of front gardens visually to street use.

8) To increase outdoor space by the use of flat roofs for suitable purpose, such as drying, sunbathing, growing small plants.
Several forms of housing fitting the Christchurch suburbs in terms of the principles outlined, will now be described. Each fits the principles to varying degrees and therefore offers solutions at varying time scales, some immediate, others long term, although more attention will be paid to the former. It should be emphasised that none of these are mooted to replace the suburban houses as dominant, but to fit in with them, improve on some of the problems and offer a greater variety of housing types and thus suburban life styles.

The housing will be grouped into three types which for want of better words are named as follows:

A: **Independent**: each unit independent from its neighbour both structurally and functionally, and occupying its own area of land. Needs little effort to plan as control of design by neighbours is minimal. Proposals in this group are the closest to the present situation.

B: **Group**: each unit is still an independent living unit from its neighbours, but they are related by some common features such as partition walls or uniform architecture. There is thus a higher degree of visual relationship between independent units. Each unit has its own area of land, e.g. row housing.

C: **Structural**: units become part of a common structure and may to varying degrees share facilities. They are often divorced from the ground by "stacking" in multi-storied buildings, and access is often only by foot along corridors. Apart from balconies, outdoor space is likely to be communal. The highest density forms
of housing belong to this group, and they are the most removed from the present suburb, although could have important application at suburban nodal points. Will only be dealt with in passing.
A: **Independent housing:**

Independent houses, but with their sections designed and enclosed as private outdoor living space.

Immediately applicable to suburbs and already occur there (Figure 23). Requires greater investment in site design and walling, but might be offset by savings in land and improvement in housing environment.

Mainly inward-looking, although can be designed for outlook onto street, to benefit of streetscape. (see Figure 22b over).
Benefits: greater privacy
          greater shelter/shade
          house design can be chosen by owner.

Problems: greater cost of site development
          neighbours must agree on walling design/
          cost etc.
Christchurch vernacular white blocks and steep roof. High wall ensures privacy and shelter for outdoor living spaces. More expensive than normal section treatment, and despite offering an unapologetic blank face to the street, does not fail to please. Pentlow Place, Fendalton.
ii Independent house on walled section but foregoing some sideyards so wall becomes part of the roofed living structure:

Subdivision could include construction of all common walls to load-bearing standards so that owner buys section plus walls and adds flooring, partitions and roofing in desired form and location (See Figure 25).

Benefits:-privacy

-sheer/stage

-allows both independence of individual home builder and minimal interference his neighbours by his efforts

-more effective outdoor spaces provided, or alternatively, requires less section area

-control of street facade relatively more easy

-less rigid town planning ordinances necessary, at least with single-storied buildings
- roofed space can be expanded or reduced relatively simply, as the need arises.
- possible reduced building costs.
- reduced heat loss through common walls.

Problems:
- greater initial site outlay
- would require changes in town planning regulations
- overshadowing of neighbours if more than single-storied development.
- possible loss of privacy from any neighbours house more than single storied
- still requires some design of overall street patterns
- houses can ignore the street
- would require increased use of skylights some rooms.
FIG 25:
SUBDIVISION TO INCLUDE
CONSTRUCTION OF
LOAD-BEARING COMMON WALLS
SITE: 90 x 50 feet  
( = approx. 1/10 acre)

HOUSE: 2,200 sq. feet  
brick and concrete  
floor, with basement  
garage under

FIG 26:
HOUSE, SOUTH YARRA, VICTORIA
(Source: Home and Building 1/3/69)
FIG 27: SQUATTER SETTLEMENT, LIMA, PERU.

Construction of walls precedes roofs in this rain-free area. Compounds are thus relatively independent of their neighbours unless more than single storied. Street design needs attention.

(Source: Caminos et al (1967): Urban Dwelling Environments)
Courtyard housing:

iii Dwellings inward looking to central courtyard in manner of Roman house. House outer walls thus have effectively become the section walls of the previous two alternatives.

Benefits:
- save land
- house interior better related to outside in a variety of weather and light conditions, times of the day etc.
- outdoor privacy
- individual can choose his design
- can expand house according to means or needs
- houses can be built as single units
**Problems:** - inefficient house layout

- central space would be more of a single use area than some New Zealanders would want, not catering sufficiently for their outdoor industriousness.

- would require changes in town planning ordinances.

- introspective, and would do little to enliven its street.

- could lead, en mass, to street monotony.
FIG 29: COURTYARD HOUSING, TAPIOLA, FINLAND

Source: von Hertzen et al (1971)
Finland's New Garden City:
Tapiola
FIG 30:
COURTYARD HOUSING PROPOSAL
PRESTONS ROAD CHRISTCHURCH
GENERAL VIEW
(courtesy Davie, Lovell-Smith and Partners)
FIG 30 (cont): COURTYARD HOUSING PROPOSAL, PRESTONS ROAD, CHRISTCHURCH
individual unit can be expanded within its walls according to individual requirements.
(Courtesy Davie, Lovell-Smith & Partners)
B: Group housing:

i. **Terrace or Row Housing.** Individual units of related visual and structural design, usually more than single-storied, and separated by common walls. Each unit has its own street entrance and section of private land, this last characteristically surrounded by a high wall.
Benefits: - economy of land
  - serves living requirements well
  - economy of heating through decreased heat loss in common walls
  - economy of roading because sections likely to be long and with narrow street frontage.
  - can be variety behind the height and bulk requirements.

Problems: - requires overall planning of the street
  - could be noise problems from streets and between buildings
  - street would carry more traffic and parking from increased density of settlement.

There is ample scope for variety in the spaces, heights, levels etc., with use of sloping roofs, attics, sub-basements etc. Units can also be of varied size, and so therefore should the sections be, perhaps by varying their width within a common depth. Variety can be heightened by the incorporation of small attic or basement flats with their own entries and outdoor spaces (e.g. on rooftops for attic flats) vehicle storage, proper sound insulation from the main house and with controlled outlook over the private house outdoor spaces. Such units could increase the financial return from his section of any owner willing to include it when he builds.

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**FIG 32:** INCORPORATION OF SUBSIDIARY FLAT INTO TERRACE HOUSE
FIG 33: MEDIUM DENSITY HOUSING
The near units are architect-designed for their site and display considerably greater charm than the rubber-stamp units beyond. Two stories with individual entry and garage, some private outdoor space, and in the Christchurch vernacular, such units form a visually satisfactory solution to the need to increase suburban densities. Rossall Street, Merivale.
Conversion of existing shop. Illustrates varied and interesting treatment of in and outdoor spaces in a medium-density situation.

FIG 34: TERRACE HOUSE, PADDINGTON, N.S.W.

FIG 35: PAIR OF HOUSES, NORTH ADELAIDE

Two couples built a house each on a single lot, of area less than the Council's minimum requirement of 3,960 sq. feet each. Special approval was obtained by observing certain minimum standards of accommodation and by building together. The lot was subdivided after completion of the houses. Note the small private outdoor spaces, the privacy, easy maintenance and external access to rear gardens by a shared alleyway between the houses. This is bridged over at first floor level and forms the storage areas for each main bedroom.

contin ...
FIG 35 cont

site: 6,000 sq. ft (1/7 acre)

coverage: 36% excluding walkway

density: 29 persons per acre

dimensions: each block 30 x 23 ft
            alley 3 ft wide

areas:  ground floor (each) 690 sq. ft
        first floor (each) 720 sq. ft

    total (each unit) 1,410 sq. ft

(Source: Home and Building, 1/3/69)
Comprehensive Developments. Closely related to the independent housing types in that the units are relatively discrete. However, are included here because the units are usually all planned and built by a single designer or agency with related appearance and usually much tighter use of land — i.e. each unit may be on as little as 11 or 12 perches, and as far as there is a designed relationship between them, so they are considered as part of a group rather than independent. The procedure is that not only is the land subdivided by the initial agency, but the houses are also built before the lots are sold. Because of the greater control possible the layout more often departs from the simple street and section dichotomy than in previous forms by use of grouped entry courts, access lanes and the like.

This is the housing form illustrated by the Christchurch City Residential Urban Renewal Report (1971) for housing reclamation areas. It can be considered for such a purpose because a single agency will be undertaking design and construction.
FIG 36: RAEKURA PLACE, REDCLIFFS, CHRISTCHURCH: Private comprehensive development of twenty townhouses on approx. 2½ acres (including road). Average lot size 14.7 perches. All houses 1323 sq. feet, built by developer to four alternative architects' designs.
C: Structural housing:

These forms of housing will not be detailed here, being more the forms of the inner city rather than the suburbs. Such as tower and high rise blocks are included. In the short term they would find most suburban application in the larger nodes and although in the long term some adaptations could be useful suburban housing forms, this study will concentrate on the two groups already detailed.
b) **The Street**

If it is true, as was said earlier, that the individual section is the most successful level of the suburban triumvirate, it is probably also true that the street, is the least successful part of the three. Somehow our section-oriented attitudes have led to neglect of the street, not only its maintenance and use, but also its conception and planning. This has shown up in the visual form which the suburban street has come to take.

Some inadequacies of the street are:

- lack of enclosure
- lack of focus
- often unsuitable scale for its use
- lack of "serial vision" - i.e. of variety of the spaces down the length of the street
- dominance of linearity
- alienation of the street from its surroundings
- invariable subordination of all uses to the traffic function
- conflicts in the materials, shapes, colours and scale of the visual components
- unsuitable street planting
- visual dominance of the surroundings by the road
- harsh surfaces.

Lack of enclosure results from the general low height of the single storied suburban houses in comparison to the generous width of the normal street. The New Zealander typically prefers wide open spaces, and this has led to the same assumption here as in some countries overseas that the more spacious a layout, the better it is. Simonds (1961) writes
the following on the subject:

"A common error in our city planning and our zoning ordinances is the assumption that the more space there is between buildings and the greater is the setback from the street, the better. Thus by regulation, is foreordained a city that resembles a sieve - open, vacuous, where most outdoor activity is visible from the streets, and where walled outdoor privacy is often not even permitted. Most of the city's myriad side-yard or buffer spaces might better be consolidated for some significant use. Air, sunlight, and open space are highly desirable features, but their distribution and treatment are as important as their extensity.

People enjoy compression. Georgetown in Washington D.C., surely one of the most delightful residential areas of our country, has narrow brick structures set wall to wall along its narrow, shaded streets.....In this compact community, where space is at such a premium, the open areas are artfully enclosed by fences, walls or building wings to give privacy and to create a cool and pleasant well of garden space into which the whole house opens.

....The author (Simonds), in working long with public housing, has discovered that the very openness of a project is at first the thing that has most appeal to families who move in from older neighbourhoods or from the cramped and aching slums. But soon they become dissatisfied with the severe buildings, the wide grass areas, and the play equipment set out on flat sheets of pavement.

....Private or community "living spaces" become a reality only if they and the life within them are kept within the scale of pleasurable human response and sympathetic understanding" (pp 197-199).

While space is all very well in its place the result in the suburbs is generally that the enclosing elements become so far separated across the street, relative to their height, as to lose their enclosing effect. Thus, to the person in the
street the houses fail to contain space to any significant extent.

It is not only their physical separation which leads to this failure, but also the small size of the houses relative to that separation. Houses of the typical suburban size need to be located closer to the road than they are in order to contain better the space between. Or alternatively, at existing road widths, the houses need to be bigger - say 2 or 3 storied.

We all like at times to feel enclosed and insulated from the world, to have shields around us, for instance when as children we built play houses from boxes and packing cases. Dr Freud would have said we like the security of our mothers womb. At other times we like to feel the freedom of boundless open spaces, empty to the horizon, where we can feel free and unconstricted. Our surroundings should ideally provide both feelings at different times so that we don't periodically have to get away and seek them out in the country or the seaside.

The suburban street, however, fails to provide either feeling very strongly for two reasons. One is the already mentioned lack of size of the houses relative to street widths, - lack of enclosure. The other is that because of the repetative nature of the buildings in their size and setback, they do not provide any variety of enclosure down the length of the street, from strongly enclosed to open space. Thus, enclosure is typically both weak and monotonous, and hence our appreciation of the occasional large trees which add variety to the scene. Hence also the greater interest of streets in a hilly city such as Wellington, because there the
surveyors had to adapt their subdivisions to the terrain, varying the line and width of the streets, size and shape of sections, etc. How much more interesting are these streets where people had to be adventurous in building, where high cuttings give way to open views and the whole is a pattern of enclosure and openness, up and down, and interesting winding in and out. One minute the houses are roofs viewed from above, the next, high basements perched above. It is not that any more conscious design has gone into the Wellington street than the Christchurch one, but rather that in adapting to nature's pattern of gulleys and hillsides, the Wellington one comes out with both pattern (from nature) and variety whereas the Christchurch one results only in lack of pattern and monotony. In Christchurch, therefore, it must never be forgotten that special conditions prevail, and if interesting lively streets are wanted, they will have to be consciously designed, unlike Wellington where they can more easily "happen". Variety of line and enclosure will be two of the most important tools of this design.

The two points of lack of enclosure and lack of its variety are well illustrated by Papanui Road.

Firstly, the buildings, as for example between Holly and Innes Roads, are mostly large old two-storied houses, built for rich people but now largely divided into flats, boarding houses and the like (Figure 37). Because of their larger bulk Papanui Road gives a much more satisfying feeling of being "in" the street than does, say, Cranford Street, its equivalent to the east. Yet both are the same width. It is the size of the houses that makes the difference and the trees.

Also, enclosure varies down the length of Papanui Road
FIG 37: SUBURBAN ARTERIAL ROAD
Similar traffic standards to fig 40, but enclosure considerably improved by larger buildings and trees. Papanui Road.

FIG 37: SUBURBAN ARTERIAL ROAD
FIG 38: PAPANUI ROAD, SERIAL VISION.

Road length is pleasantly varied in enclosure, size, type of its spaces. Several major visual events add interest. Note that strong enclosure at the nodes coincides with the end of each straight, creating the correct visual emphasis according to the principles of fig 46.

The former is usually much stronger.

LEGEND

- BUILDINGS
  strong enclosure
  medium
  light
  isolated enclosive bldg
  other building

- TREES
  major visual significance
  major tree, view under

- MAJOR VISUAL EVENT
- MAJOR SUBURBAN NODE
- OPEN VISTAS
  clear ground
  over rooftops

LOCATION OF FIG 37

SCALE: APPRX. 16 CHAINS TO AN INCH
NORTHERN SHOWN
DRAWN: GH. DENISEM 18/10/73
Leaving Bealey Avenue, the traveller is well enclosed by shops and a hotel. He then emerges into a short stretch of single-storied houses which allow the eye to (metaphorically) range wider towards empty sky to the east. Then there is the long stretch of two-storied houses already mentioned, channelling the eye again and followed by the even tighter enclosure at the St Albans shopping centre, as shops and verandahs come close to the street. Turning the slight bend, the traveller emerges to more two-storied houses and then beyond Innes Road, to the open fields of St Andrews College where the eye once again ranges wide before re-entering suburban housing.

The trip down Papanui Road is rather like a piece of music. The spaces swell from low to high, wide to narrow, long to short. Together, they form a tune, and to anyones ears any tune is preferable to a single monotonous drone note. So too, then, with the spaces of a suburban street, the monotonously even spaces become a sort of visual drone and like the tune we come to long for wide and narrow, high and low, long and short.

It was mentioned earlier that trees go to the creation of a streets enclosure also. Some of what are often regarded as the "best" streets in Christchurch get much of their atmosphere from their large trees. For example Helmores Lane, or the part of Clyde Road in Figure 39. These streets are little different from any in Christchurch other than their trees giving a softening and enclosing effect to the street - usually from trees on private sections. Hence the difference between Fendalton, where trees grow well, and Sydenham where they have not been so favoured. And hence the problems of Aranui and
Large trees dating from early settlement completely transform this otherwise typical street scene and make a lasting impression on the mind. Clyde Road, Fendalton.
FIG 40: SUBURBAN ARTERIAL ROAD
Post-war streets can still be wide, linear and uninviting when traffic considerations are allowed to dominate. Compare the lack of enclosure with figs 37 and 39, although the relative immaturity of this scene should be remembered. Avonhead Road.
FIG 41: MEDIUM DENSITY HOUSING
Larger two and three-storied flats considerably enhance the enclosure of this street scene, although they could potentially overload it with parked cars. Newbridge Place, Ilam.

FIG 41: MEDIUM DENSITY HOUSING
FIG 42: OLD WORLD ENCLOSURE

the extreme north west suburbs, where problem soils demand special trees for the conditions, which is seldom taken account of in planting. Aranui is very sandy and the north west often very free draining and droughty. See also Figures 40 and 41.

The answers to the enclosure problem are simple in theory - narrower streets; buildings larger or closer together and grouped to create positive spaces rather than negative corridors; large trees. However, to see these done in practice would involve concessions in some of the New Zealanders most basic tenets, such as the right to build and plant trees wherever he wants to, and the goodness of open space, so it will need to be a quiet, diplomatically executed change to the streets. The benefits of enclosure gained - and they surely are real - must be carefully weighed against the costs of other suburban characteristics which could be lost.

A second group of problems of the suburban street are concerned with their lack of focus. The early grid streets were particularly bad in this respect, as was seen earlier in this study, and although the problem has been lessened in more recent subdivisions, it is by no means fully dealt with. The realisation that a physical "end" to a street made it feel much more of a comprehensible space (Figure 43) led to efforts since the State Housing period to curve streets, thus closing the view. The result has been the curving street pattern, light heartedly referred to as "intestinal", which has marked subdivision since the Second World War. The individual street is markedly improved by such a procedure although suburb-wide a lack of focus still exists through repetition of this newfound standard pattern.
The linearity of this street is relieved by the interest of the hillside scene it is aimed at, although this is not in this case guaranteed to promote driver attentiveness.
Selwyn Street, Spreydon.
FIG 44
FITTING OF LARGE TREES TO STREET CORRIDOR

Small trees such as one planted now combine well with large street trees although planting needs to be borne in mind.
The problem of street focus is difficult to solve within the confines of public property. Large buildings or trees to "aim" at are usually private and occur haphazardly, although sometimes none the less effectively. Also, placement of such focus buildings as tower blocks or suburban shopping centres is dictated by other rigidly enforced criteria than visual ones, and few chances to influence their placement can be expected under the present system. Many suburban planners have experienced virtual blackmail by large shopping chains insisting "there and only there" for their supermarkets, and the process of suburban development is not geared to resist these pressures in New Zealand. One method can be the use of council protection orders to establish and retain important groups of large trees where they may be seen to be necessary. However the fact remains that on many of the small sections of today the taking of such space would prove a major imposition on the owner. It might be possible to manage initial street design to provide bulges, recesses and left-over corners in the street corridor to provide room on public property for a few major trees (Figure 44). It might also be possible to persuade councils to accept some such parcels of land as reserve contribution.

In general, it best suits a streets pattern of enclosure and focus when the buildings are closest to the street and larger near the corners. The areas of greatest visual event (= enclosure) thus come to coincide with those of greatest functional event, with relaxation of both in between.
The second alternative is a much weaker visual form in comparison. Also, it sets aside spaces which are much less useful for any street functions other than traffic. A road safety benefit should result from the first alternative in that driver interest and therefore alertness should be greatest at the intersections, where they are most needed. The second alternative on the other hand, would lead to relaxation near the intersections as the spaces widen. It is the form most favoured at present because of sight-line requirements for traffic, and while it is not being said that these should not be catered for, it must be remembered that to worry only about sight lines will results in the negative of the best visual street pattern. Ideally this should be a series of spaces, where suburban life can be carried on, narrowing to confined interest points for drivers at the intersections.

These principles point up other problems of the suburban street. Standardised widths of reserve, carriageway, berms, and house setbacks down the length of the street, with uniform heights of buildings, uniform tree plantings, all laid onto the flat topography, leads to an unpleasant dominance of linearity in the street - even of curved streets. They become corridors rather than a series of spaces, and such unvaried spaces cause a journey to become the monstrous "drone" mentioned...
in the earlier comparison to music. This is perhaps not necessarily detrimental to the traffic function, although it is suggested that it leads to decreased driver attentiveness and therefore problems of his reactions and of road safety, but it becomes very depressing visually, while also detracting from other possible functions of the road for pedestrian and inhabitants use. Certainly if enjoyment of a journey is counted as part of the traffic function, monotony from corridor-like spaces becomes a disfunctional element. Add this to the fact that few street users other than motor traffic require such linearity, and are rather alienated by it, and the claims for some breaking up of streets into spaces become very strong.

The visual problem is created by the eye continually being drawn down the street and seldom coming to rest, so that streets become restless, vaguely uncomfortable places, not conducive to feelings of ease for anyone who is not moving. It is not clear whether this alienation is consequent to or the cause of our negative attitudes to the street as against our private sections. Obviously each reinforces the other in a cycle of what the sociologists call "circular cumulative causation", but the visual results to the street can be considered directly related to the restlessness of the New Zealand outlook, which was previously commented on. The nervous state of always wanting to be somewhere else, and the thoughtless rushing here and there is translated to the ground in the streets.

The solution of this problem lies in the creation of the road as a series of spaces rather than as a corridor. Not until the individual can feel at home can the street begin to
become a positive part of city life. It is possible through purely visual means to make an individual feel so uncomfortable when travelling in a car that he desires to stop, for relief. Large trees or buildings crowding in, of fine texture and strong colour, or manipulation of the carriageway so it becomes awkward or uncomfortable or dangerous. These are all ways to make a travelling person want to stop. Such a street would be the opposite of the present street where the stationary person feels so uncomfortable that he is stirred into movement. Rather, the individual is being hounded into stillness in this newly hypothesised street.

Obviously, this is not a technique for all streets. Those which are important arteries must be efficient and pleasant to use, and thus broken up into spaces within the confines of traffic requirements, to create a pleasant journey. Those which are purely residential streets, on the other hand could be treated with such "anti-movement" techniques, and such others as being made blind so as to eliminate through traffic, and designed to create spaces suitable for people on foot, for living in. The intermediate classes of feeder roads require elements of both, and care must be taken not to make either function unpleasant. At present only the traffic function is considered seriously in such streets.

Creation of a series of spaces down the road is once again relatively simple in theory, but more difficult in practise, because it involves control of peoples right to "freedom". House setbacks and sizes, and tree groupings could be managed so as to advance and recede, rise and fall in height according to the principles of Figures 38 and 45. Early
State house layouts attempted to do this (Figure 7).

But, some might say, in a linear street we are creating a beautiful avenue (Figure 47). The answer is, in short, rubbish. Firstly, a successful avenue requires large trees meeting or at least approaching each other overhead. Secondly, the concept of an avenue is much less valid for the New Zealand lifestyle than it was for (say) the France of Le Notre. Those people then admired the grandiose and enjoyed the excitement of moving down an avenue by carriage at a time when it was relatively out of the ordinary not to have to walk. An avenue was something special, fitting for that time. Today in New Zealand we shun the grandiose and admire the casual. Traffic goes much faster, and it is humdrum to be in a vehicle — indeed, it is unusual for us to be on the street any other way. Also, the spaces available for an avenue in the New Zealand city are much smaller than those in Royalist France. Paris had been a formless, torturous maize of alleys and lanes. The need was for broad straight lines, and led to wholesale demolition of housing to form the grand boulevards and squares for which Paris is known today — a process akin to the creation of a motorway today, but likely much more ruthless. Paris
The hardness and width of this 1920's street are lessened by its plane trees, which thus justify their existence. However, their uniform size and spacing and their linearity emphasize the existing linearity problem of the street, while their small size does little to relieve the suburban scale. Location of trees within the carriageway seems to have dropped from favour today, but is very effective in some streets e.g. Symonds Street in Auckland. Rocker Street, Spreydon.
FIG 48: STREET ARCH, ITALIAN VILLAGE

frames the view, divides the houses into readily identified precincts, and protects either side from undesirable elements in the other.

Source: De Wolfe (1966) The Italian Townscape p. 55
was formless and needed straight streets. It was confined and needed broad spaces. In Christchurch the whole city is linear in its street form, and the need is for more restful spaces not more corridors. Nor is the need generally for wider streets. The point is, that with some possible exceptions, the avenue concept does not fit today's suburbs of Christchurch. They could work for special streets such as Memorial Avenue, were we willing to design and plant them specially, but not for residential streets. The New Zealander wants to be informal and natural near his home, in keeping with his general life preferences, and the suburban street can best fill this role as a series of spaces, not as an avenue.

Linearity is also decreased by curving the road alignment to close the view. This process has already been discussed and although insufficient on its own, has already been applied to the Christchurch suburbs since the State Housing era. However, even the curved street can be linear in character, all be it curved lines. What is really at issue is the difference between the dynamic, which results from lines, be they straight or curved, and leads to restlessness, and the static, which results from spaces and leads to restfulness and finiteness. Applied to the suburban street, therefore, there is too much of the dynamic line, which should be decreased somewhat in favour of the static space, to make the street more restful.

One way that this occurs in an Italian town is seen in the archway of Figure 48. The street becomes a separate identity, definite and easily comprehended as "here" and "there" - i.e. you are either in it or out of it. Such a situation is vastly more restful than always knowing there are more streets
leading on round the next corner. The suburban cul-de-sac in New Zealand begins to provide for this need.

A third element serving to emphasise the linearity of the suburban street is what might be termed the street engineering - kerbs, channels, footpaths, poles and wires - all the devices held necessary for the functioning of the street and its housing. These are commonly laid in set, regular corridors and spacings, and act to divide the street into long strips rather than spaces. Sometimes, as in the case of underground services, although not themselves emphasising linearity, these engineering elements exert strong linear constrictions on other street functions, such as street trees. This study does not hold that it is necessary, desirable, or even possible to change this situation in all cases, but rather that it is desirable in part to soften or dispense with some engineering elements sufficiently to make the street more liveable for pedestrians. For instance, some post-war residential streets in the Auckland suburb of Papakura have no concrete kerb and channel, but merely a grass berm shaped to perform similar functions.

![Cross-section of residential street](image)

**FIG 49**: CROSS-SECTION OF RESIDENTIAL STREET IN THE AUCKLAND SUBURB OF PAPAKURA (DIAGRAMMATIC)
Drainage is evidently no great problem in this area with twice the rainfall of Christchurch, admittedly probably aided by more relief (although some streets are flat for long distances). Also, the grass surface would probably be less able to survive a Christchurch summer. But the point is firstly that it is possible to be more flexible with street engineering, and secondly that the visual effect of these particular streets described in Papakura is a vastly softer one, and much different to what many people hold as absolute minimum engineering standards for the suburbs. There are surely many areas of low density and low speed vehicle use (i.e. local streets) where considerable amounts of money could be saved by not wasting needless engineering furnishings. At the same time, the streets could look better, and function just as well. The main problem would be that a few designers might have to think a little in the process of their work.

It is also possible within present production technology to vary the street engineering if it is still held to be necessary. Figure 50 illustrates four complimentary kerb and channel types, and their use.

FIG 50: VARIATION OF KERB TYPES WITHIN A CUL-DE-SAC
Kerb type 1 and 4 give linearity where that is needed - for example on the corners where orientation needs to be given. Types 2 and 3 are softer forms for use both where visually suitable and where greater freedom of vehicle and pedestrian use is not undesirable. Thus, cars are channelled on entering the cul-de-sac of Figure 50, and separated for safety from pedestrians. But, near the head of the cul-de-sac there is greater freedom for them to pull up onto the footpath at slow speeds in order to turn, or pull off onto the verge to park. Thus the carriageway can be kept narrower and the traffic function less obtrusive, as befits a local residential street.

Street planting has typically emphasised the linearity of the street. Figure 47 shows a similar lack of event as results from the regular spacing of houses. Probably half the number of trees in the photo could create the same effect with intelligent grouping, and there could thus be more space left for other uses. In addition, the eventfulness which trees add to a street come more from the very large ones than from many small ones - compare Figures 37, 39 and 47. While the smaller trees obviously soften the street somewhat, and are not therefore without worth, they have little effect on its form or linearity.

The problems of sizeable trees in the street can be considerable because of their root damage to underground services, kerbing and interference with overhead wires and the like. Bealey Avenue is a good example of their effect on the road formation itself. Even small trees are traditionally limited in their location by the regularity of underground service corridors which leave only small spaces free for
trees. The concept of the street as a service corridor is a real problem for creating more liveable streets, because the traditional agreement of service authorities to minimise interference with each other by sticking within agreed corridors in the road reserve makes good sense, and has solved their needs. But it has constricted both location and size of street trees to cause the linearity previously mentioned, and puts a real barrier in the way of departures from this tradition. The main conclusion on this subject which emerged from a meeting to discuss street trees held by the Waimari County Council in July 1973 was that departures from this pattern were quite possible, but would cost more. The service authority spokesmen stated that although they would not readily accept change, they could not refuse it, but would of course have to pass costs on to the subdivider. The conclusion was that sufficiently flexible visual street patterns could result from all parties being sufficiently interested in each others concerns and sitting down together early in the design process to plan the street layout to mutual satisfaction.

Some trenches can be shared. Alignments can be varied sufficiently down the street length to achieve the desired results. Small trees and shrubs can be located over cables so long as someone is willing to bear the cost of lifting them if cable maintenance is necessary. Tub trees and shrubs could be used if necessary, possibly with the tubs "planted" to ground level, to be lifted when necessary. This would serve to protect the plant at such times, and also the cable from plant roots.

Another tool which could be used in association with these methods is to plant deep rooted trees where possible.
These will cause less disruption of kerbing and services on or near the surface. Some such deep rooted trees are oak, horse chestnut, plane and most conifers.

More long term solutions could be achieved by the stacking of services in underground ducts, expensive, but providing accessibility to service crews without excavation and if constructed heavily enough for the purpose, able to protect the cables or pipes from tree root damage.

FIG 51    SERVICE DUCTS

It could also be mentioned that overseas a further cable must be catered for in the corridor, for television, which is commonly distributed by cable rather than transmission and antennae. It is not known if this could be introduced in New
Incorrect scale is a major visual problem of the suburban street. By correctness is implied suitability for the function it fulfills. Scale in architecture is defined by Haggar (1962) as "a harmonious relationship of the parts to the whole, and of the whole to its surroundings and to the human figure". The same writer defines human scale as "The design of buildings so that all the details are related to the needs of man". Thus, what is meant by incorrect scale of the suburban street is that the collection of houses, trees, front-yards, fences, footpaths, gutters, roadways, lamp posts etc. are not of either related or correct dimensions to feel "right" for the users.

Not that the demands for "rightness" are simple, with such a wide range of users, from the toddler investigating his first gutter to the schoolboy on his bicycle, the businessman in his car and the commuter in his bus. Very different sized objects are required to feel right for a person travelling at 30 miles per hour in a car and for a person walking at 3 miles per hour. The former needs things to be larger to make the same impression on his senses. At 10 times the pedestrian speed an object will therefore require 10 times the bulk to make the same mark on the traveller at 30 miles per hour as it did on the pedestrian at 3 miles per hour.

To a motor-borne observer, the suburban street is a confusing blurr of too-small objects, out of scale for his needs, and his only possible response is to "turn off" his awareness somewhat and try to pick out the occasional more prominent larger building or tree etc. All the finer detail is missed in the blurr. The pedestrian, at 1/10 the speed
takes 10 times longer to pass each object in the street, giving him that much more time to take in many more of the details of that street, which may appear much more in scale for him. However, to him the passing motor traffic is out of his scale by being faster and larger and noisier than him, so that the traffic part of the road, becomes "foreign territory". The busier the road, the more foreign it becomes. How then to cater for the scale needs if not only a wide range of people, but also people walking and in cars?

One solution would be a policy of locating the larger multi-unit types of housing on the busier roads. Their bulks are more in keeping with the scale required by moving traffic and would seem more "right" from the car. Other larger buildings such as public halls, supermarkets, hotels, factories likewise fit best the scale of the larger suburban roads. This point is well illustrated by Blenheim Road, one of the major arteries of Christchurch which has large factories on one side in much better scale with the heavy traffic than the suburban housing on the other side. It also explains the better "feel" of Papanui Road, mentioned earlier with regard to enclosure. The larger houses lining the road are much more in scale than are those of Cranford Street.

A policy of locating multi-unit and transient forms of housing on the more major roads would appear to be in keeping with the preferences noted in Palmerston North by Dickson (1969). People owning their own properties there showed a preference for living in the quieter more community-like atmosphere of the cul-de-sac, whereas people renting their accommodation showed a dislike for these sites, presumably being more willing therefore to tolerate the heavier traffic
conditions of through and major roads. Certainly, it would be in best keeping with the residential scale requirements to omit as much through traffic as possible from the streets, which would suggest the desirability of cul-de-sac wherever possible.

A second solution to incorrect scale therefore would be to control traffic. Blind streets would eliminate unnecessary traffic if properly labelled, and the detached residential buildings then need relate only to their local, slow speed traffic and pedestrian activities with which they are relatively well in scale. What is called for is a controlled road hierarchy to protect residential areas from traffic encroachment, even at the expense of some inconvenience to traffic. It does after all, require little effort to have to drive an extra 100 yards in ones car. If such a road system were supplemented by frequent walk and cycle ways and alleyways, many local journeys would become more convenient by foot or cycle than by car, thus further decreasing some unnecessary "lazy" traffic.

A third solution to the problem of incorrect road scale is to group the roadside features – e.g. houses and trees – to form larger units more capable of creating an impact on the vehicle-borne observer. This, therefore, is a technique for the more busy traffic streets. The street then becomes a series of groups rather than a blurr of individual houses. This policy would reinforce the need to decrease linearity which was outlined earlier (see over):
The presence of large expanses of hard surfacing constitutes a further visual problem of the suburban street. It was worst in the old Victorian-Edwardian streets which were wide expanses of unrelieved seal. The problem has been lessened since by the introduction of grass and street trees, and the inclusion of more front gardens into the street scene, although a trend of the recent affluence has led to some reversal of this softening by a penchant for turning large areas of private sections into "easy care" hard surfacing.

Hard surfacing has come to be equated in many minds with "development", and development with the town. Thus has come the association of concrete with town and grass with country. The popular current favour of country over town has been translated into favour of green plants over hard surfacing by some people, possibly a physical manifestation of concern at the pressures of urban living. Thus the presence of extensive areas of hard surface have come to be regarded as a "problem". Its solution lies firstly in the general preference for as much "green" as possible in street design, a policy which will probably find most application in detailing and secondly, by
careful design of changes in hard surfacing to create the spaces needed.

A further criticism of the visual aspects of the street is for the confusion of materials, shapes, sizes and colours of the houses, fences, planting, each resulting from some persons decisions on building and decorating. This is opposite to the drab uniformity of English terrace housing, and results in an uncontrolled random miscellany without pattern or beauty, except by chance. It is perhaps strange in a city where people take so much pride in building their homes and tending their gardens that the overall effect, far from being one of endless interest and excitement, is rather, confusion and monotony. Interest does exist on the level of the individual section but just as any pop song becomes humdrum after a couple of weeks over-exposure on the radio, so too do even the better sections. Few units, however good in themselves stand up well to patternless repetition. Furthermore, there are in the flat streets of Christchurch few useful means of controlling the patterns and nuances of housing and planting on private properties. The existing town planning ordinances don't help, serving rather to perpetuate the repetition of standard units.

The solution for the miscellany of the Christchurch suburban street lies in overall design to give patterns of colour, texture, shape and size. This is a very doubtfully applicable policy is the general climate of opinion however. The best results have in the past occurred where there has been a single overall developer, be he private or a public institution. Early State Housing streets are some of the most unified in Christchurch, from similar but not repetative
architecture, and a general relationship of planted trees. Other more recent comprehensive developments also. Areas of group housing have the potential for some greater unity, if only the challenge were grasped by the designers. The worst streets are those in the more affluent areas, where exists the highest proportion of people choosing their own individual designs or doing it themselves.

Major social consequences have resulted from our preference in New Zealand of giving the streets over largely to vehicular functions. The carriageway has come to dominate the road which has as a result decreased in its conduciveness to foster alternative activities. For example, the holding of a spontaneous neighbourhood cricket match on the road would be frowned upon. Also, the traffic function has come to decrease the standard of environment of the individual houses. The suburban street is a sad story of alienation, repulsiveness and restlessness. We disown the streets and do not feel at home there unless surrounded by our car for protection. Social contact is not fostered, experienced or expected and anyone not conforming is immediately held in suspicion of being a pervert or of sinister intention. Many people would rather hurry home to the safety of their own four walls and T.V. than risk the effort of the "dangers" of social contact.

Visually this schism is represented in the distinction between street and section, as for example when a resident declines to mow the grass on the street outside his property because "it doesn't belong to him". On the other hand, books are full of the delights of Italian streets, and it is tempting to want to try a recreate these here. However, in the words of Rudofsky (1969): "A town is not the result of a design
programme; it is the reflection of a way of life". And in
the words of Lewis Mumford "A city does not exist by the
accretion of houses, but by the association of human beings".
Thus the streets of Christchurch reflect us, the people of
Christchurch. This study will not attempt to design perfect
streets, therefore, because we would not be at home in them,
It will, rather, attempt some improvements, and hope that
perhaps people might begin to think beyond the points raised
here, that perhaps ultimately what we really think and value
in our streets may be crystallised and recognised. At
present the community's thinking on this topic is muddled
and riddled with inconsistencies, to say the least.

c) The Suburb

On the level of the whole suburb - that is, the collection
of many streets and other facilities as well - several visual
and conceptual problems exist. Some have been touched on
already.

One of the main problems is the lack of a clear identity
of many parts of the suburban mass. Extensive areas of un-
relieved single storied housing continue the suburban fabric
for considerable distances, creating not only relative monotony,
but also a relative lack of personality variation in any
particular area. A given post-war street could be in any one
of three dozen parts of the city and not look very different.
The effect on people, which is after all the basic criterion
for judgement of a suburb's worth, is that it causes greater
confusion, uncertainty and misunderstanding of their surroundings,
and as a result defensiveness, than would be the case for areas
with a stronger sense of identity. Defensiveness is a very negative social outlook. The example has already been mentioned of the shopping centre with three adjacent shops labelled "Merrin Post Office", "North Avonhead Pharmacy" and "Russley Supermarket". People need to know readily where they live and where they are, and it is held in this study to be one of the main problems of the Christchurch suburbs that the definition of individual suburban units is so grossly inadequate. This problem is at its greatest proportions in suburbs on flat topography, such as Christchurch's are, although it must exist more or less in most New Zealand cities. Like the third dimension of street design and because of Christchurch's special situation, special steps need to be taken to consciously design for what the topography provides in some other cities. A view of a portion of the Christchurch suburban fabric is seen in Figure 17.

This view also provides a clue to one of the solutions to this problem, in the plantation of large trees in the middle distance. These mark one of the original homesteads of the area, in this case Middleton Grange in Upper Riccarton. The point about these trees is that they grew while land was still available to support them and have been significant enough to survive subdivision of the surrounding land. Relatively few such parcels of land have been so significant in the growth of Christchurch, which has been the reason for the formation of such relatively continuous areas of suburban housing. There needs to be developed some method for indentifying and retaining strategic land for area definition during subdivision, or buying it back afterwards if necessary. An important defining
area already in existence for example, is Riccarton Bush. Some existing parks could come to double in this function with major planting. The important thing is that a strong contrast be offered to break up the continuity of the suburban housing. Open spaces such as Jellie Park could do it, but the effect is much more strongly created by trees large enough to dominate the suburban scale, and in extensive enough belts to influence the senses unmistakably. They must provide a definite break between one functional suburb and the next.

What is envisaged is a city divided into a series of well-defined units or cells, each forming a functional suburban unit relatively independent of its neighbours, and likely centred on a shopping centre. A local road and path network would lead from all parts of the cell to its node, while regional roads would connect cells to each other and the town centre. It is not claimed that this would be achieved by planting alone, because there are a wide range of other factors also involved. There is a hierarchy of existing suburban shopping centres already well documented in Christchurch planning circles, and which form the basis of many suburban activities. Other planning is into units of sufficient size to be served by a primary school. The Christchurch regional road network, at present partially established, is another of the contributory features. This is not a new idea, having been in use for some time overseas. Spark and Gawn (1969) mention the planning of such units in Harlow New Town, and Buchanan (1964) traces the concept back to Radbourne, New Jersey, designed in 1928. In the Christchurch situation, the concern of this present study is the visual demarkation of the functional units using as a basis existing major plantings,
such as Middleton Grange, Riccarton Bush and Hagley Park. The concept is illustrated in Figure 53, although it is emphasised that this is no more than a first sketch of the concept.

Areas containing major plantings should not be of single use. They may be parts of public parks, as for example, Little Hagley Park, or they may be the sites of large institutions such as Rannerdale War Veterans Home or the Middleton Grange School. Or they could provide sites for alternative forms of housing such as larger houses for the affluent, communes, hostels. They could well be the locations for a system of walk and cycle ways removed from vehicle traffic, crossing under major roads, linking various cells and the city centre. What is important is that the use be such as respects the land as different to the normal suburban fabric, and not to be "urbanised" in the way the suburbs have in general. The other important point is that because of the flatness of Christchurch, special efforts are required to break-up this fabric into definable physical and functional units. Large trees are suggested as a major visual tool in this process.

A second part of the suburban fabric which could be improved on is the difference between different areas. It was described early on how various ground conditions caused initial selection of areas which were and were not built on, but how in the long run, a homogenous suburban layer covered everything. This development took no account of varying soils, and much inappropriate planting took place, as is described in a later section. The result has been for much and
FIG 53: CONCEPT OF SUBURBAN IDENTITY AREAS Major roads and plantings and the hierarchy of suburban shopping centres used to divide the suburban fabric into visually and functionally discrete cells.
FIG 53: CONCEPT OF SUBURBAN IDENTITY AREAS

Major roads and plantings and the hierarchy of suburban shopping centres used to divide the suburban fabric into visually and functionally discrete cells.
few-treed suburbs to emerge e.g. Fendalton compared to Aranui, largely a result, it is supposed, of soil differences. It is now suggested that different suburban units could capitalise on such different conditions to create identities of their own. The Central city and Fendalton are obviously areas for English trees, as are other wet areas such as St Albans, Riccarton, Opawa, St Martins, although New Zealand natives could perhaps be emphasised in some. Aranui and the sandy areas of east Christchurch, in keeping with their problem conditions, could emphasise pines or conifers, or contraversially, no trees. The dry, gravel areas of the north west such as Russley, could emphasise dry-regime trees such as Eucalypts and Acacias and hardier deciduous such as walnut, chestnut etc. It seems fairly certain that the English atmosphere traditional to Central Christchurch is not properly capable of extension to the problem areas east and west and so different suburban characters are mooted for them.

Having land available for housing in the suburban edge belts suggested earlier to define suburban boundaries would solve another problem of the Christchurch suburbs - that of lack of variety in the accommodation available for citizens. There are at present few alternatives to the 32 perch section, while demand for alternatives is illustrated by the popularity of 5, 10 and 20 acre residential farmlets surrounding the city. These are considered a social evil by many for taking up productive farmland, and the real motive is interpreted to be hope of future profit on subdivision. While this is undoubtedly so for some, many others genuinely want the more spacious, or non-urban life. Others favour communal living.
Such people as these could utilise land in the edge belts for their housing, with the understanding properly formulated, that theirs were multiple-use areas, and the large trees stayed. Religious and social communities, hostels, transient accommodation, rooming houses would all fit the areas suitably. Many of these have been housed till now in the large old houses of past years. Few are being built now, and as those existing disappear with age there is going to be a strong need to cater elsewhere for those sections of the community not wanting or needing to be housed in suburban bungalows. The setting of large trees is suitable for high-rise buildings also, as seen on the perimeter of Hagley Park, because they act as a visual foil and backdrop, and are in scale with such buildings.

Also, by attempting to consolidate the suburban nodes, it may become possible by providing a system of local walkways for some journeys - e.g. shopping, to school - to decrease the number of unnecessary vehicle journeys which at present occur. If such local journeys thus became safer more traffic reduction would ensue, because many parents at present prefer to drive their children to school, play etc. to ensure their safety on the roads. With a better rationalised local walkway system it might be possible to decrease dependence on the car, which many people think is necessary without doing much about it. It may also act to consolidate the nodes, from which public transport can feed the central city.

A benefit of making available more variety of section sizes in the suburbs would be a move in public attitude away from the strong street - house fixation which many people seem to regard as the only two "normal" land uses for the suburbs.
Land for any other purposes is regarded as "lost" to housing and profit, and is often only grudgingly obtainable - e.g. for public parks and green spaces. The New Zealand concept of the suburban section tightly fitted into the pattern of surrounding houses is in strong contrast to that, for example of Scandinavia, where houses seem to be more readily located amongst free and natural spaces. Admittedly many different ecological and social circumstances prevail, but the point is that few citizens of Christchurch have probably ever thought about much alternative to the tight suburban subdivisions they know. Walk and playways do exist, as for example the delightful grouping of Royds Street and Dacesbury Park at the head of Harakeke Street, Fendalton. However, were these common they could come to exert a beneficial influence on suburban life by freeing it from the motor car - television dichotomy which at present seems to prevail. This could be one physical way to encourage social expression in the suburbs beyond the home.

The problem of the location of many buildings of inappropriate type on streets of inappropriate scale has already been mentioned. The solution must lie in suburb and city wide levels of planning by directing different types of land use into similar groups suitably located, and different forms of housing similarly. This is already done to an extent by the land use zones of the district planning schemes, which create for example commercial and industrial nodes. However these are ordered more for function than appearance at present, and in this study concern is also mainly with housing forms. It was said in an earlier section that visually it was preferable to locate larger scale housing on the larger
roads, and individual homes on the smallest scale. Thus, primary roads such as Riccarton, Greers and Ferry Roads are more suitable places for multi-unit and multi-storied housing. This is similar to what arose spontaneously in the past on Papanui Road and causes its scale to be superior to most primary roads in Christchurch. It is not likely that there will be large proportions of housing over 2-stories in Christchurch for a long time, so on most primary roads would therefore be multi-unit type housing, likely single-storied, but even so of slightly greater bulk overall than detached housing. There are also two functional reasons for this - such units, by housing more people, generate more traffic movements as also do the generally more active lifestyles of the inhabitants, coming and going with less family ties. These are far more transient communities than are groups of detached houses in a cul-de-sac.

A further popular suburban dichotemy will be questioned in passing. It is the division of home and work in most peoples minds. Most people live away from their places of work so that the suburbs tend to become dormitories which fill and empty through the working day, causing large proportions of the population to have to travel and others to be left alone all day. For some there is possibly more change in surroundings than necessary, for others not enough. The benefit of this procedure is in centralised business and industry but the suggestion is here that some of this could be carried on as well from the suburb - either the home or suburban nodes and by telephone - keeping families more together, decreasing both peak transport problems, and the wastage of having to provide two lots of space for a particular person. It could also
FIG 54: HOUSING ABOVE SHOPS: Some form of multiple use such as shown above would increase viability of life in suburban nodes and improve the economy of suburban land use, while the tightened enclosure would relate visual form to the more concentrated land use of a nodal point. Three stories would suit Christchurch better than the five or six shown here.

Source: Colin Buchanan (1963) Traffic in Towns p.191
serve to keep overheads down in some types of business. For example, a return to the old idea of shopowners living over their business, but in attractive buildings (Figures 54, 55) or, a landscape architect running business from home. It may mean he has to babysit a little more, while mother does the shopping, but the result would be both stronger family ties and less travel. However, this is not to suggest such a trend be taken to extremes. The Central Business District is an important unit of the city's functioning and it is not suggested that suburban homes could replace it merely that some of its functions could be conducted from home to the mutual benefit of people and the city. Also consolidated suburban nodes would be suitable for some businesses. For example the Riccarton Town Centre could even now be a suitable enough location, and considerably cheaper, for some reputable professional firms.

![Image](image-url)

**FIG 55:** LIVING ABOVE SHOPS. FIFTEEN THREE BEDROOM UNITS ABOVE FOURTEEN SHOPS. SHOPKEEPERS HAVE FIRST CHOICE OF ACCOMMODATION. HEMEL HEMPSTEAD NEW TOWN, HERTFORDSHIRE. (Copied from The Development of Hemel Hempstead, 1982.)
In conclusion it should be stated that criticisms and solutions of the Christchurch suburbs on the suburban-wide level are necessary more vague and generalised than the two levels previously discussed, because very little visual planning is at present possible on this wide level. Even the functional oriented town planning controls are only now evolving from their rudimentary beginnings to be more sophisticated, and few New Zealanders would hold the visual to be more important than the functional, although a case could indeed be made for this. Visual controls on the wide scale are, however, non-existent, as is much investigation of the needs, and so the proposals discussed in this final section are of necessity long term and tentative, depending on a wider body of investigation beyond the resources of this present study.
III: STYX MILL - THE STUDY AREA

6. THE REGIONAL SETTING

The purpose of the study to date has been examination of the cultural and historical background to the Christchurch suburbs. The task now is to turn to the chosen site and use this background in the preparation of a proposal for a new suburban area. Therefore, this section will now direct the material of the previous section towards the Styx area in general. The following section will then deal specifically with Styx Mill Study Area itself.

a) Physical

The location within the Christchurch region of the Styx Mill Study Area is seen in Figure 56. It lies within that triangle of semi-rural and rural land between the Waimakariri River in the west, the sea in the east and the northern most suburbs of Christchurch immediately to the south. The land is generally flat, in keeping with most of Christchurch and across it flows the Styx River, a local stream, entrenched in a shallow valley rather unique in the Christchurch landscape. The site lies 5 miles from the Coast, and behind both the dune formations which line the coast and the peaty area of the Marshlands swamp imprisoned behind the dunes. Thus although not too distant from the coast the physiography is definitely river-derived and not coastal.

The Waimakariri River is large, its headwaters alone draining a catchment of 900 square miles. These are the steep
FIG 56: LOCATION OF STYX MILL STUDY AREA WITHIN CHRISTCHURCH REGION

(basemap: Christchurch Regional Planning Authority)
View west from Main North Road showing lane-like enclosure and southern boundary of study area on right. Note large poplars left of carriageway.
mountainland interior of the eastern South Island, and so the Waimakariri is one of the three "big" rivers of the Canterbury Plains fed from the mountains behind. Flows are thus more affected by weather in the mountains than in the Christchurch area, and can amount to 180,000 cusecs in flood. At times of normal flow however it meanders in braided channels across a bed of rounded greywacke stones and gravels. At its present nearest point, the river lies between 2 and 3 miles from the Styx Mill Site, although until a new more northerly course was cut during the floods of 1868 it was perhaps half a mile closer than that.

The soil pattern of the region is of gravel-based river-derived series trending north west to south east and meeting sandy and swampy coastal series trending approximately north south. The Styx Mill Site lies on the former (Maps 2 and 3).

The regional soil pattern was seen earlier to have influenced the development of the Christchurch urban area, drier areas being preferred to wetter. However, this influence was only in timing, and the type of development which has occurred on either has not differed. Today it is difficult to identify former wet and dry areas in suburban Christchurch with such undifferentiated development, and most wet areas having been drained.

Lack of recognition of the varying soils has led to several problems:

Firstly, foundation problems as houses settled on swampy soils over the years. This is common, for instance, in St Albans.

Secondly, problems with plant and tree growth where
unsuitable trees for the conditions are planted. People have relied heavily, according to Jackman and Mulligan (1971), on extending use of the traditional English deciduous trees of the City centre throughout the suburbs, when in fact different trees should have been used for wet and dry, sandy and peaty soils. The result has been either a high mortality rate or else stunted, struggling specimens incapable of thriving in the conditions. However attractive these trees may be as healthy specimens, it would seem far better to use trees which in themselves would appear less attractive, but which because they can thrive in their location will actually give a better appearance than a struggling misfit.

Thirdly, the blanket application of tree species has contributed to the suburban monotony, and a golden opportunity has been missed for creating the varied suburban identities mentioned earlier as desirable. Obviously, some suburbs have emerged more treed than others, Fendalton compared with Aranui being two cases in point, and while a variety of factors would have contributed, soil must surely have been one of the most important. Aranui is so sandy that most plants require careful nursing whereas in Fendalton they almost can't help but grow. Identity based on soils could have made a significantly more interesting suburban pattern, with for example, the north west being the eucalypt suburb, Marshlands the poplars, Fendalton the English, the Groynes near Belfast willows and so on.

The significance of this to Styx Mill will be expanded in the following section, and it is sufficient to say here that the variable soils over the site will require the whole gamut of planting from English to gums to willows.
The likelihood of flooding in the Styx River is debatable. The river rises in the two or so miles above the mill through numerous springs, where water from the uppermost aquiferous which underlie all of Christchurch and provide her water supply, upwell through an extremely porous subsoil. The water source in normal times is thus fairly regular, and similar to the Avon. The source of these aquifers is soakage into the bed of the Waimakariri. However, the Waimakariri in flood traditionally used to overflow into the catchments of the Avon and Styx, causing serious flooding of settled areas. The worst recorded incidence on the Avon was in February 1868 when the water level extended up Worcester Street from the river to the west end of Cathedral Square. The worst occurrence in the Styx appears to have been 1905 when the Waimakariri burst the railway embankment at Chaney's and flowed down an old channel to the Styx, two lives being lost. It is doubtful if the Styx Mill area is affected so much as downstream, but Belfast has been several times threatened and Kaiapoi regularly inundated up to 5 feet 6 inches deep in some streets.

Before human settlement, but in the very recent geological past, the Waimakariri used to find its sea outlet in various different places to the present. One is said to have been Lake Ellesmere, another the Avon Estuary, so various parts of the Christchurch region must have been inundated from time to time. Old river channels still lace Christchurch. Since 1900 massive protection works have been constructed and the likelihood of further such flooding in either the Avon or Styx Rivers can be considered remote. Obviously it cannot be considered as impossible, because one cannot rule out the 1000 or
10,000 year flood, but nothing would save the whole region from such. For all practical purposes it will be assumed that any flooding of the Styx River is likely to be local and therefore confined within its valley.

b) Cultural

It will be seen from Figure 56 and Map 4 that the Styx Mill Study Area lies strategically placed regarding many regional development features as well as the physical ones just mentioned.

Firstly, the Main North Road out of Christchurch, which is in this stretch also State Highway 1, borders the east side of the property.

Secondly, the Addington - Picton (Main North) Railway Line, an important freight route to the North Island via the Cook Strait Rail Ferries, crosses the Main North Road 10 chains south of, and passes to the east of, the study area. The Main Road crosses the railway by an overhead bridge well known to most Christchurch people.

Thirdly, it lies adjacent to and immediately outside the Christchurch urban fence, so that it epitomises the controversy of those rural areas likely to experience pressures for urban development in the not too distant future.

Fourthly, it lies in an area of countryside whose very existence can be considered as significant, lying as it does between the Christchurch urban boundary and the subsidiary but separate built up area of Belfast. This is in fact, the first green space encountered when travelling out of the city.

Fifthly, Styx Mill Road is strategically located to carry traffic from a significant catchment area to the Main Road,
should urbanisation occur.

The following is proposed for the Main North Road.

From Figure 56 it is seen that it leads onto the Christchurch Northern Motorway two miles north of the Site, and that Johns Road, the city bypass, rejoins the Main Road within a mile, thus channelling off some potential traffic past Styx Mill. From Johns Road to the Motorway the Main North Road is currently being upgraded to 4 lanes but not limited access status. The work is almost completed. South of the Styx Mill Rail overbridge the road was upgraded to 4 lanes sometime ago, as far as Cranford Street. The proposal is to eventually join these two sections of 4-lane road, probably by constructing a second rail overbridge alongside the existing and widening the road past the Study Area at Styx Mill. This road will then act as an intermediate city outlet until completion of the full Northern Motorway further east at some time more than 20 years away. Timing of works on the Main Road is difficult to predict, but the Ministry of Works suggest hesitantly that it wont begin within the next 3 years, and probably not within the next 5. The work will create a 4-lane, divided carriageway, limited access road adjacent to the study area, and involve the taking of some land at present within the site for road widening. The extent of such a requirement is seen on the Proposed District Planning Map (Map 4).

Existing traffic volumes in the area are seen over the page:
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Styx Mill Road at present has a strong character rather unique in Christchurch. Its width is less than normal, at \( \frac{1}{2} \) a chain, and with gorse hedges lining both sides, it is much more strongly enclosed than most other rural roads near Christchurch (Figure 58). The Proposed District Scheme requires its widening to normal width which will necessitate removal of all hedging and unless the Council is particularly determined otherwise, also of two groups of poplar trees on the south verge of the road, seen on the site survey map. It could be possible to ease the carriageway around them, but specific effort would be required in this direction. Loss of the tight character of Styx Mill Road is seen as inevitable in the event of urban development as gorse hedging is not likely to survive such an event, even were the road not to be widened.

The place of the study area in the regional road pattern is shown in Figure 14. It is encircled by the following
arterial roads - Main North, Northcote, Harewood and Johns, with a new arterial road being proposed from Johns Road to the future motorway, passing south of Belfast township and within 5 chains of the study area's northern boundary to run on the line of the existing Radcliffe Road. The land enclosed by this ring is cut approximately in half north-south by a primary road on Highsted Road, west of the design site. Styx Mill Road, classified a secondary road in the Proposed Scheme, terminates at Highsted Road. Thus in traffic terms the study area can be counted as part of that area of land encircled by Main South, Styx Mill and Highsted Road, and the unnamed link between Johns and Radcliffe Roads.

Lying just outside the urban fence, the study area is zoned rural, which allows minimum subdivision of 20 acres with a frontage of 660 feet. However, besides the suburban fringe a few chains south the residential unit of Belfast should be noted within $\frac{1}{4}$ mile of the study area's northern boundary. Belfast is an early township centred on a large freezing works near the railway, and has lately grown as a residential area for Christchurch as well. Current population is 1805 (1966). Immediately north of Belfast lies the Christchurch Northern Motorway and the Waimakariri River beyond which are the rapidly growing dormitory towns of Kaiapoi (3528) and Rangiora (4117).

The study area thus currently lies in a "green belt" about $\frac{1}{2}$ mile wide between the City and Belfast, and which as already pointed out, forms an important event in the journey into and out of Christchurch.

Immediately north of the site lie 3 orchards which sell their produce in roadside stalls and add a further distinction
FIG 59: MAIN NORTH ROAD
View north from approach to the railway overbridge. Styx Mill Road intersection, left foreground, Styx River bridge at bend with the study area and important planting of exotics behind.

FIG 59: MAIN NORTH ROAD
View to south, of highway entry to Christchurch, showing eastern boundary of study area on the right, and the impact of the exotic planting near the southern farmhouse.

FIG 60: MAIN NORTH ROAD
FIG 61: STYX RIVER
View northeastwards across the Main North Road. The wet lowlands in the foreground form part of the regional reserve proposed by the Waimari County Council. River is entrenched at left - possibly the site of the original Styx Mill.
General view towards south-west of site from northern scarp. Shows dairying, river cut and the trees typical of the wetlands.
to the character of the area (Frontpiece).

Within the suburban fringe Papanui is the nearest main suburban focus and Styx should be considered in its orbit for more specialised shopping facilities, although the Christchurch Central Business District would also be important. A local shopping centre also lies on the junction of Prestons and Main North Road some 30 chains south of the study area, at what might be termed Redwood. A large new tavern is also under construction at this point. However, to use this shopping centre from the study area entails crossing both the Styx overbridge, which at present has no pedestrian provision, and also the Main Road.

Existence of the railway has been mentioned. It creates a strong visual, functional and conceptual division of the study area from suburban land to the south, even although rail traffic is not especially heavy. Styx Station lies north of the track within 5 chains of the Study Area but across the Main Road. It is a small station of only local importance. An enclave of houses has also established itself north of the line, on top of the southern escarpment of the Styx River, east of the Main Road. These are zoned urban and have a pleasant sunny outlook over the Styx valley and State Highway 1 to the north, and also present a strong but not unpleasant picture for traffic entering the city.

After crossing the overbridge, traffic on the Main North Road drops through a small cutting to cross the Styx River on a slight embankment and soon after climbs easily again to regain the original Plains surface (Figures 59, 60, 61). The whole of this episode is straddled by the study area which begins at the cutting and ends on the Belfast surface and thus, bordering
the site is one of the most eventful stretches of the road out of Christchurch, both in being rural, and in its interest. The traveller experiences a strong, positive event, and because the area is in addition rather unique in topography and history (Styx Mill) it should be capitalised on in any future development.

The Proposed Scheme shows 100 acres zoned Industrial, south of Styx Mill Road and facing the study area. This land is owned by the New Zealand Railways Department and is part of the route of the proposed Sockburn-Styx Loop Railway. Railway development would not necessarily be expected on the Styx Mill Road frontage, and indeed the land might not be taken up for any industrial use, but under the terms of the proposed zoning, such effects as noise, smoke, smell, effluent, vibration, dust, glare or what the Scheme calls "other objectionable elements" could not be ruled out.

The proposed Sockburn-Styx Loop Railway is located in Map 4. It was originally proposed to reroute the Addington-Styx Section of the Main North Line to run outside the City, rather than as at present through several of the suburbs. The old line would be closed and turned over for other uses, and Styx would be the point where the new route rejoined the old. The new line would carry all rail traffic to and from the north. It is not at all clear whether or not this line will in fact be built, but although many doubts exist, there is no reason at present to suppose it will not be.

Its effect on the study area would be largely peripheral, causing distant noise and also disruption of the land area to which at present it contributes as part of a functional catchment. Much of the area to the south west would be cut off
and orientated in other directions functionally, causing the part of the Study Area near Styx Mill Road to become a rather isolated enclave. This would be heightened by the development of an industrial area to the south of Styx Mill Road.

A large part of the study area is zoned as a General Recreation Reserve, covering the whole valley floor extending for a mile above the Main North Road and including land already purchased for the purpose upstream from the study area. No land within the study area has been bought as yet. The reserve when created will be a regional one comparable in size to Hagley Park, and thus one of the largest in the city. Furthermore, only a half mile separates it from the large expanse of open space of the Waimakariri River bed including the existing reserve at the Groynes. A similar distance separates it from Harewood Park, a proposed, but smaller sports park to the west. Considerable areas of open space will thus exist in the Styx region in the years to come and it, with surrounding districts lining the Waimakariri, can be expected to become an extremely important recreation outlet for Christchurch. This fact, plus the uniqueness to Christchurch of the Styx River topography, makes being a public reserve an appropriate use for Styx Mill, and so inclusion of about a third of the study area in such is welcomed in this study. Presence of a regional reserve would enhance the standard of environment in the surrounding neighbourhoods.

The Waimari County Council have prepared a tentative development plan for the reserve, which includes sports fields in the wide part of the valley floor, a heavily planted natural area at the narrowest point plus walks and drives and a small lake between. Adjacent housing development will attempt to
fit in with this pattern or suggest any desirable variation of it.

There are proposals for a retirement village on the study area in Styx Mill Road, on the South terrace of the Styx Valley. An early application to the County Council was declined, but another is currently being considered and may well be successful this time. This study will not attempt to cater for the village in preparing a final design, not because it is held undesirable, or unlikely, but in order that a free hand may be held in design of the area. Housing for the elderly will be provided within the community created.

The District Planning Maps show the horizontal approach surface for Christchurch International Airport as covering the southernmost part of the site. The airport is about 4 miles distant and any height restriction will be very minimal, so for practical purposes will be ignored. In normal weather conditions aircraft operations do not affect the study area, although aircraft are seen low over the Waimakariri fairly continuously. It is suspected that in nor-west weather they would pass close to the site, but because this would constitute no more of a problem here than for most of northern and western Christchurch so affected, it is not considered an especially important nuisance.

An attempt needs to be made to predict what suburban development will occur in the vicinity of the study area. Given lack of planning controls, it would be safe to assume that most of the land between Christchurch, the Waimakariri and Belfast would become built up in the next 10 to 15 years, and that the study area would become part of a Styx suburban area. However, this will probably not be the case for a
variety of reasons, and while the urban limit will be pushed outwards in parts, the existing green belt will be retained substantially intact. Belfast will probably always be a separate identity, and of course the Waimakariri will always remain as an open area. Much of the farmland at present remaining is first rate land, and this, coupled with the current need and readiness to apply the green belt principle to Christchurch by both planners and public, may be sufficient reason for much of the area to be permanently withheld from urbanisation. In short, the urban area will probably encroach on but not engulf the Styx-Johns Road area, and some legal means will probably be implemented to preserve much of it for all time as green space, although possibly still in private ownership. This would be well in keeping with the policy of the Christchurch Regional Planning Authority. There are sufficient other places for the predicted population increases of Christchurch to be absorbed, and although currently a controversial topic, three can be mentioned:

i) South west of Christchurch. Existing towns in the belt Tai Tapu - Lincoln - Springfield - Burnham be allowed to expand and more or less coalesce to form a new loosely connected series of cities in a ring, separated from Christchurch proper by a green belt in the vicinity Halswell - Prebbleton - Templetont - Yaldhurst.

ii) West of Christchurch. A new town with a single focus with the object of becoming a twin city for Christchurch. West Melton is often mooted. Currently an often publicised alternative, but probably the least likely of the three.
iii) North of the Waimakariri. Development on the same principles as in i) between Kaiapoi - Woodend - Rangiora. Styx would be part of the Waimakariri green belt.

Other areas will also expand - e.g. Governors Bay and the hill suburbs - but not on the scale of the above, where the bulk of the increases will be absorbed.

Thus, the pressures on the Styx area need not lead to urbanisation. There are reasons for retaining it in green, there are the means to retain it legally, and there are alternative places where urbanisation can logically occur. Probably, therefore, the study site will in reality continue to be farmed for town supply for at least another generation, and after that may become more of a recreation area, as densities increase within Christchurch - certainly a more multi-use area than at present. This study however, while acknowledging this reality, will now proceed to hypothesised the Styx area covered in suburban housing, and a suburban fabric and density relatively like the present suburbs, surrounding the regional park on the Styx River. This is because the design to be undertaken is intended to be illustrative of suburban possibilities in general, rather than to encourage the development of any particular piece of land. The land is the vehicle, and while its physical conditions must be acknowledged and incorporated in the design - i.e. while it is physically realistic - it is also acknowledged that the proposals are not likely to be realised on the chosen site.
7. THE SITE

Introduction.

The study area is a site of 190 acres immediately north of the Christchurch urban fence (Figure 56). At present it is owned in two titles by the Church of England and leased to a private company for farming. Present use is town supply dairying.

a) Relief

Relief is more varied than is usual for Christchurch, the site containing the valley of the Styx River, a small stream, but of some local significance. The flat-bottomed valley lies generally 10 to 15 feet below the level of the surrounding land and is separated from it by the relatively steep escarpment seen on the contour plan. The river, extends for some miles above and below the site, which is about 5 miles from the coast.

The site is a microcism of the surrounding region, straddling the regional valley and including parts of both the Redwood and Belfast suburban surfaces. It will have to be decided whether its best function is to emphasise the divide between these two or to aid their integration.

b) Soils

The soils on Map 3 are derived from Kear and Rennie (1965). Naming is according to this source although descriptions are in part transposed from the equivalent classifications of Kear, Gibbs and Miller (1967), which are included in brackets.
Kaiapoi Silt Loam (= Morven Silt Loam)

Highly fertile but of slow to medium drainage. Likely to be waterlogged in winter, and remain moist in summer, with watertable at about 3 feet. A widespread soil of the lower river flood plains north of Christchurch.

Waimakariri Fine Sandy Loam

Waimakariri Sandy Loam (Waimakariri Sandy Loam)

These two are not differentiated by Kear, Gibbs and Miller. Of medium to high fertility, they are light and very free draining and therefore liable to summer drying. They are recent soils, of Greywacke gravels with loess veneer, widespread near present and former river courses on the Canterbury Plains.

Te Kakahu very Shallow Sandy Loam (Waimakariri very stony Sandy Loam)

A recent soil consisting of loam over gravels. Very rapid through drainage and subject to severe seasonal droughtiness, but with strong water regime on site, owing to emergence of underground flow in times of high water table. Liable to gley. Can be considered as approaching the status of swamp soils in this site.

Responses: For planting, the Kaiapoi soils are the most permissive, being suitable for most deciduous and European trees. Productively they give high yields from intensive cropping.

Waimakariri are the next most permissive, being limited productively to deep roofing crops capable of utilising reserves of soil moisture at times of slow water tables. Trees should be limited to more wind tolerant species.
Deciduous trees will not do well in general, being limited in spring and autumn by nor-west buffeting and in summer, their main growing season, by water shortage. Wind tolerant species such as Ulmus, Castanea and Juglans are suitable. Otherwise the traditional "dry" trees such as Eucalypts should be used.

Te Kakahu soils are the most limited, being suited only to water regime trees such as the Poplar and Salix hybrids. Productively they are suitable only for extensive grazing.

Regarding buildings, the Waimak Soils should present no problems, nor the Kaiapoi, although the latter may require some extra foundation measures to prevent long term settling. Structurally the Te Kakahu series are capable of supporting buildings adequately but careful consideration would need be given to water emergence on any particular site before building.

c) Hydrology

As has been stated, the site has a relative abundance of water in comparison with the general Christchurch situation.

The Styx River is probably closest compared to the Avon in size, flows, water type, tributary area etc. and the two rivers were often mentioned together in early reports of Christchurch.

Soil moisture varies across the site. The present farmer regards the north west and valley portions as "wet" and the middle ridge and southern area near the Styx Mill Road as "light". Such differentiation correlates with soil types.
d) **Climate**

Weather records are seen in Figure 63 and the Survey Map and are for the nearest similar station for which data is available. Christchurch Airport is approximately 4 miles distant, and Rangiora 11 miles.

Temperatures are equable, being warm in summer but seldom oppressive, and cool but not harsh in winter. Grass growth is checked during the coldest 2 or 3 months and frosts are common, but soil temperatures remain above freezing as do mean daily air temperatures. In summer, temperatures are seldom hot enough to scorch plants, but water sources are rapidly dried up and drought conditions often occur.

Rainfall is relatively light and effectiveness greatly decreased by summer temperatures, humidity and winds (see evapotranspiration figures on Figure 63).

Wind frequencies are shown on the survey map. The nor-easter is typically a summer sea breeze, relatively gentle, but serving to decrease the pleasantness of many summer afternoons. The sou-wester is the "weather" wind, bringing cold wet conditions, sometimes as a strong gale, and occurring all year round, especially winter. Most of Canterbury's rain arrives from this quarter. The nor-wester is a blustery, hot föhn wind, often gale force, common about the equinoxes, raises temperatures into the 70's and 80°'s, and serves to decrease rainfall efficiency markedly by dessicating the countryside.

Buildings traditionally turn their backs on the sou-wester, while screens are often erected to shield outdoor spaces from the nor-easter, but there seems to be little reaction in
MEAN DAILY TEMPERATURES

MEAN MONTHLY RAINFALL

Annual rainfall:
24.5 in
62.2 cm

FIG 63: CLIMATE RECORDS, CHRISTCHURCH AIRPORT

Christchurch in terms of buildings, to the nor-wester.

In human terms winter is a time for largely indoor activities and anything outdoor requires shelter or suitable clothing. However, it should not be forgotten that pleasant sunny days often follow the overnight frosts, and small, warm sheltered spots can be most enjoyable at such times. In summer, shade and fresh air are the needs, with easterly wind shelter and protection from the odd cooler night.

e) Farming

Present use of the property for town supply dairying would seem appropriate for the land, although a few uncertainties over-shadow operations at present.

One is the future of the lease, for it is possible that the land will be taken for housing on expiry of the lease in 1977, and it is not worth investing capital in a lease showing prospects of termination.

Another is the pending requirements of parts of the land for other purposes. Map 4 shows approximately $\frac{1}{3}$ of the site to be removed for the regional reserve, while another proposal if implemented will remove approximately 14 acres at the south for the Old Peoples Village. Loss of this land, especially the former (valley) land, would severely restrict farming operations which depend heavily on the wet valley for summer production and the running off of dry stock. At present a good blend of wet and dry land exists to carry production in most weather conditions - moist in the north, dry in the middle and wet in the valley. Loss of any of these would require either a drop in production quotas or more preferably the taking in
of neighbouring land to the west. Another possibility would be to buy 40 acres or so elsewhere - for instance Oxford or Rangiora, for running off dry stock.

Without clarification of these problems the tenant is understandably wary of committing the substantial investment which is necessary to retain the property in production. Otherwise the time will arrive when tightening hygiene requirements force the property out of town supply.

f) Buildings and constructions

Buildings on the site are noted on the Survey Plan. Both these and fencing suffer from a lack of attention, undoubtedly due to the uncertainty of the future of the site.

Power lines and sewers are also seen on the Plan. It is noteworthy that Styx Mill Road is at present completely free from lines and cables of any sort.

g) Legal

No easements or limitations were registered on either of the two titles on September 11th, 1973. The owners of both are the Church Property Trustees - i.e. the Church of England, and the leasees of both are Inanga Farms Ltd. The lease was a seven year one, taken out on May 1st, 1969, and therefore expiring on April 30th, 1977. The occupier of the land is a sharemilker.

The main legal limitations on site use will therefore be town planning ones, from the Waimairi County Proposed District Scheme, which was outlined in an earlier section.
FIG 64: NORTH-WEST OF STUDY AREA
General view to north west over Kaiapoi soils to northern boundary. State of fencing and drain in foreground indicative of the uncertain future of farming on this property at present.
h) **Visual and neighbouring influences**

Several views into, from, and within the site are noted on the Site Survey Plan.

Noise should also be noted. In the eastern half of the site a continual rumble of traffic can be heard passing down the Main Road at speeds approaching those of the open road. This noise could be obtrusive for any urban development close to the road. Well onto the site, for example near the main farm house and westwards, the noise dwindles to insignificance. It is also lessened by the road dropping into the Styx Valley, the intervening bank acting as an effective noise baffle for this stretch of road. A solution for traffic noise overall is thus desirable.

Railway noise is heard all over the site, and would be a nuisance at any point to future inhabitants predisposed to think it so, even although it is of more occasional occurrence than road noise. It would, in addition, probably be increased if the Styx Loop Line were ever built, as trains would then pass close to the south as well as the east of the site. However, rail noise will not be considered a constraint to development because many existing houses in Christchurch lie much closer to the line than any on this site will, and people seem to accept the noise — even becoming to some a local characteristic viewed almost with affection.
MAP 4:

STYX VICINITY:

WAIMAIRI DISTRICT
PLANNING SCHEME

ZONES

Rural
Residential
Commercial
Industrial

DESIGNATIONS

Existing Recreation Reserve
Proposed "

ROADS

Existing
Proposed
Widening
Limited Access

Styx Mill Study Area

SCALE: 20 chains to an inch
NORTH: vertical
SOURCE: Waimairi County Proposed District Planning Maps
DRAWN: as at September 1973
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DESIGN PHILOSOPHY

The underlying motive of this proposal is design of the physical means in which improved human communities can grow in the Christchurch suburbs. It is held that desirable improvements in suburban behaviour will occur if surroundings are more attractive, convenient, varied, secure, safe, rich and peaceful than those built to date. Other desirable improvements are married into these as well - for example (and controversially) attempts at greater economy of suburban land use.

It is acknowledged to be an arrogant thing to determine what is and is not desirable for other people's lives, but nevertheless this is weighed against the need to improve what was clearly seen to be inadequate in the main study. The inevitable arrogance is hopefully for reasons of honest concern rather than cynical detachment, or self elevation. Likewise the seeming presumption of a landscape architect assuming to design across the whole range of professional concerns, surveying, town planning, architecture and engineering, must be weighed against the brief and resources for this proposal, and the need for presenting a coherent "landscape" contribution to the suburban mix that will hopefully emerge for Christchurch.

The means of achieving some realistic form of improvement is seen to be a balance of two things. Firstly to design a proposal familiar enough both for people to feel at home in and not to have to change their life style too abruptly, and also to be capable of construction by existing agencies. Secondly, to design it different enough that progress is made towards the better community held up as the goal.

Traffic management is held as one key manipulation factor - the car is of prime importance, but ensuring that some pleasant areas are saved from its influence. It is to be kept in its place as a tool for life, not life itself. The spine of the proposal, therefore, is a single linear traffic spine, onto which vehicles feed. It is without the normal
degree of circulation if the Christchurch suburbs in order that some land is kept free from it. In areas which traffic and other activities must share, such as a cul-de-sac where children are likely to play, the traffic standards are decreased in order that the play standards can be increased. Some local car journeys are discouraged by making them more indirect, while direct pedestrian ways are provided.

Housing is to be more varied than at present with blocks of flats, terrace and courtyard housing, some larger type housing, some with spacious lots, and some layer semi rural lots in the detached southern portion of the site, which must of necessity be a car-oriented area. A tight rural "village" is also located here. The range of transient, childless, family, and old people's needs should thus be better catered for than in existing suburbs.

The various housing types are located in some form of structure, with the higher densities and larger building on the major roads or alternatively emphasising the prominent ridge in the south east of the site, grading to substantial areas of "normal" suburban housing in the west. An attempt is made to define the suburb into physical units by means of large trees. Strong efforts are made to provide spaces for large trees, which are seen as a major foil for the monotony of suburban housing. The housing pattern is potentially extendable onto land west and north of the site, as this comes up for subdivision.

A community focus and shopping area is located for both vehicle and non-vehicle convenience, a compromise in this case, for both have valid claims to its use.

The importance of the Main North Road is acknowledged both to its effect on the site and the site's effect on it. Physical setback, substantial walling and some mounding are intended to lessen traffic noise in the houses while improved appearance for motorists is by setback, housing (which lines the ridge) skyline planting and mass planting near the road. A single entry to the Subdivision is provided, and at that point, for reasons of traffic safety on the Main North Road.
The regional park within the site is regarded as an asset, providing extensive "wild" open space as a foil for the relatively more dense housing areas proposed. The two are inseparable in the life of the inhabitants, and attempts made to merge them physically.

Horse owners will sacrifice a degree of individuality being variously required to conform to envelope, height, common wall, and common material stipulations. In some areas houses will be required to be of (say) 2 or 2½ stories, to achieve the more enclosed street scene desired. While many will be common-walled. It is intended that better environment and economy will compensate for this concession from individualists probably leading therefore to higher resale and market prices for properties. House owners can still design/build their own units, but within these stipulations. Houses are to be allowed higher than normal site coverage and variety in accommodation they provide, from small flats to spacious "villas". Third generation housing (eg. unit for widowed grandmother) encouraged in independant flats on family properties.

The importance of privacy, land ownership proximity to land/garden/lawn, vehicle storage, vehicle access, sunny aspect and some outlook are encouraged, but with the intention that houses will be largely inward looking on such flat sites. Houses on the shoulders overlooking the park and Main Road and those near Styx Mill Road which look out to the mountains are exceptions to this rule. Courtyard houses are one suggestion for privacy.

Provision is made for one street to house elderly people closer within the general society - near the community centre, and with a pedestrian way bisecting it. These Units are to be held in ownership of occupiers, or rented normally as wished, but with age stipulations (eg. only owned/occupied by those eligible for pensions).

Streets providing planting nooks and tree focus at streets ends. They provide in general the land for the major trees which are held to be essential to the softening of the constructed suburb, and will compliment the expected smallish scale planting in private sections. Street planting is in
groups to create spaces, and lines to create avenues. Serious attempts have been made to free streets of their rigid service, wire and pipe function to effect this planting and expensive concrete ducts are located under the denser housing, where they would prove economical. Otherwise in vulnerable places normal cables are located in polythene pipes to protect them from roots and enable them to be slid out rather than dug up, for maintenance.

Street enclosure is heightened by some narrowing of carriageways and corridors, but mainly by the larger size and greater continuity of the houses bordering the street. Greater coherance of the street should occur from construction controls issued as stipulations of contract on sale of the land.

The present character of Styx Mill Road is not seen as able to survive urbanisation, being dependant on a noxious weed (gorse) and what is regarded, by the County Council at least, as insufficient width. The solution is to create a new, strong character suited to the new role, with large trees bordering the road close in meeting over the top and separating footpaths, houses and factories behind from the traffic.