THE CHANGING TREESCAPE OF CAHIR TOWN AND ENVIRONS 1842-1986

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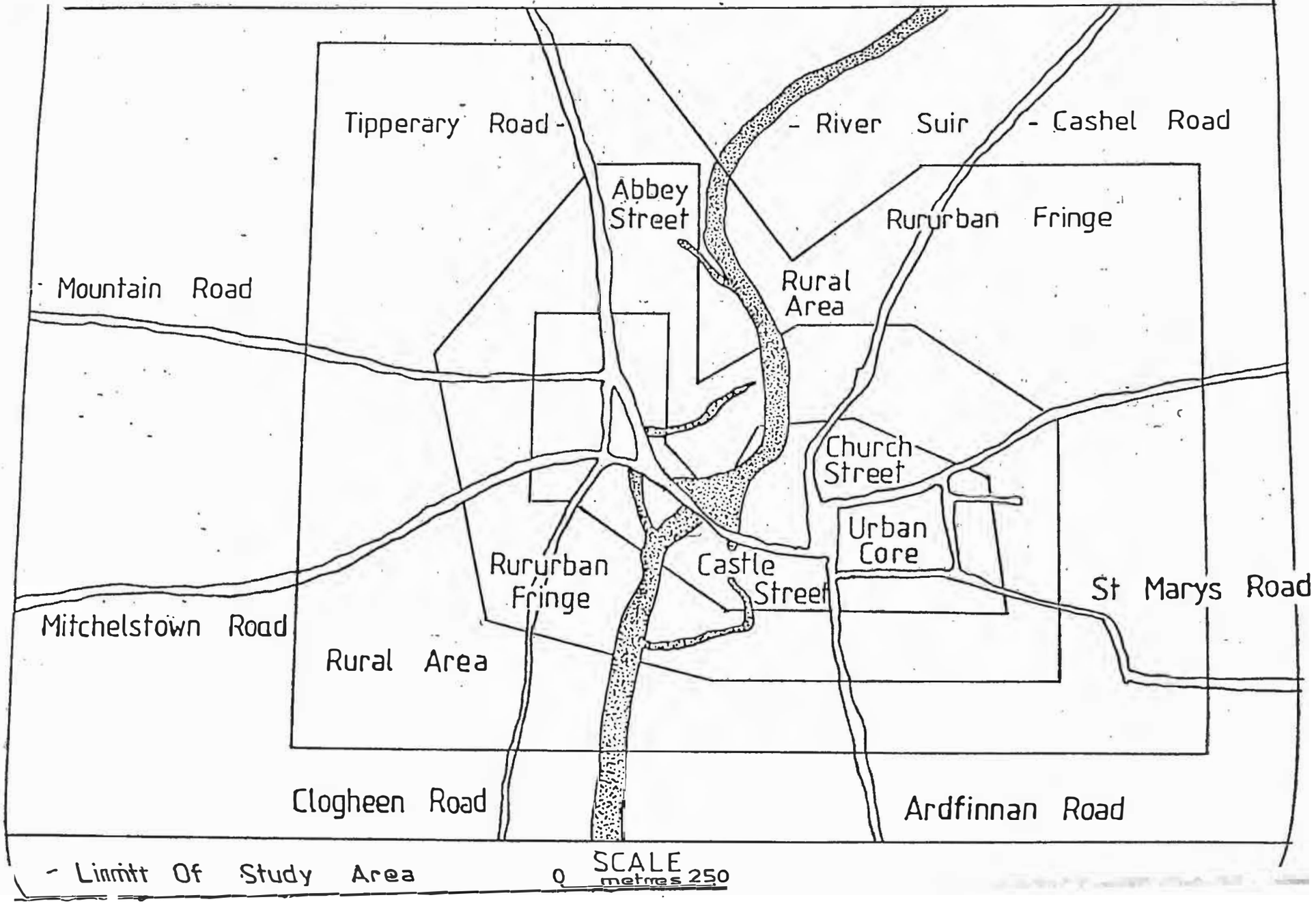
Treescape and all aspects of urban vegetation comprise an important component of the urban landscape, whether it is in a small town or a large city. Until recently this was an area somewhat neglected by research. However, this has changed in the last few decades partly due to the devastating effects of Dutch Elm Disease in many cities and towns throughout Europe and North America and partly because of a growing awareness worldwide of all things environmental. There is still a dearth of literature on many aspects of urban vegetation, particularly on small urban areas. Some research, however, has been carried out on Dutch Elm Disease, the relationship between pollution and vegetation, urban landscape planning, urban trees and their management, biogeography and paleoecology.

Very little work has been done in the area of assessing urban tree compositions or vegetation in general. Brown (1975) briefly describes some aspects of the tree composition of Birmingham city. Kunich (1982) compares the flora of nine cities of the European lowlands and shows that variations in flora over this area are reflected in the composition of urban floras. Some work has been done in this area in Ireland. Jackson (1982) outlines the results of the survey of natural vegetation in Dublin city which took three years to complete. The survey provides a comprehensive catalogue of the natural vegetation of Dublin city. Rush (1983) completed a study on the changing tree composition of Cork city island from 1100 A.D. to the present and concludes by advocating a city wide survey.

It is within this context that this article has emerged based on a research project carried out in 1986, the aim of which was to outline in detail the changing pattern of treescape in Cahir town from 1842 to 1986. To do this the changing number of the three major types of trees, deciduous, coniferous and cultivated and their locations were examined in a effort to procure some indication of the dynamics of change of Cahir town's treescape since 1842 (Fig. 1).

The data used for the analysis were taken from the 1842 6" scale O.S. map of the Cahir town area, the subsequent revision of this map in 1905 and my own survey carried out in 1986. The definition of a tree used in the analysis was that it was any piece of vegetation, which was free standing and greater than 6 feet in height and it can be either

Figure 1 MAP OF CAHIR TOWN SHOWING STUDY AREA



single or multi-stemmed (Forey, 1984). For the sake of study, the trees were analysed as clusters. A cluster being a group of trees displaying some unifying characteristics, for example, a group of trees in a garden or along by a wall. The analysis of the treescape of Cahir town was carried out at this cluster level.

When an analysis of the clusters began it became apparent that most clusters fell into distinctive categories based upon their shape (Fig. 2). These categories consisted of regular clusters which were subdivided into two, linear and complex and irregular clusters which also were subdivided into two, random and uniform. It was then possible to relate the four sub-categories of tree cluster to particular functions (Fig. 3). Linear clusters and complex clusters were found to be either for boundary delimitation, or screening. Interestingly, the screening function was limited to coniferous trees only. The random clusters were found to be ornamental in function whilst the uniform clusters were found to be commercial or semi-commercial in function.

The survey area was divided into three areas based upon the level of urbanisation in each. The urban core consisted of an area where urban land uses dominated. The rururban fringe consisted of an area where neither urban nor rural land uses dominated. The rural area consisted of an area where agricultural land uses dominated. The tree clusters were then classified in these three areas. This was further broken down by relating the morphology and function of each cluster to its respective area. This gave change through time of cluster morphology and function and spatial change as one progressed from an urban to a rural context. Survival of trees through time was also examined. The final stage in the analysis was to establish whether any broad patterns were occurring either spatially or historically and to determine the reasons for any exceptions to these. This would give some indications of the dynamics of treescape change in Cahir town and environs from 1842 to 1986.

Deciduous Trees These can be defined as trees which lose all their leaves in autumn. Deciduous trees are the most important component of the treescape of Cahir town and environs. In 1842 deciduous trees occur 447 times which represents 52.6% of the total tree cover (Table 1). These 447 trees occur in 57 clusters of which there are 18 linear and 17 complex clusters, all of which serve boundary functions. The 22

Figure 2 Examples Of Each Subcategory Of Tree Clusters.

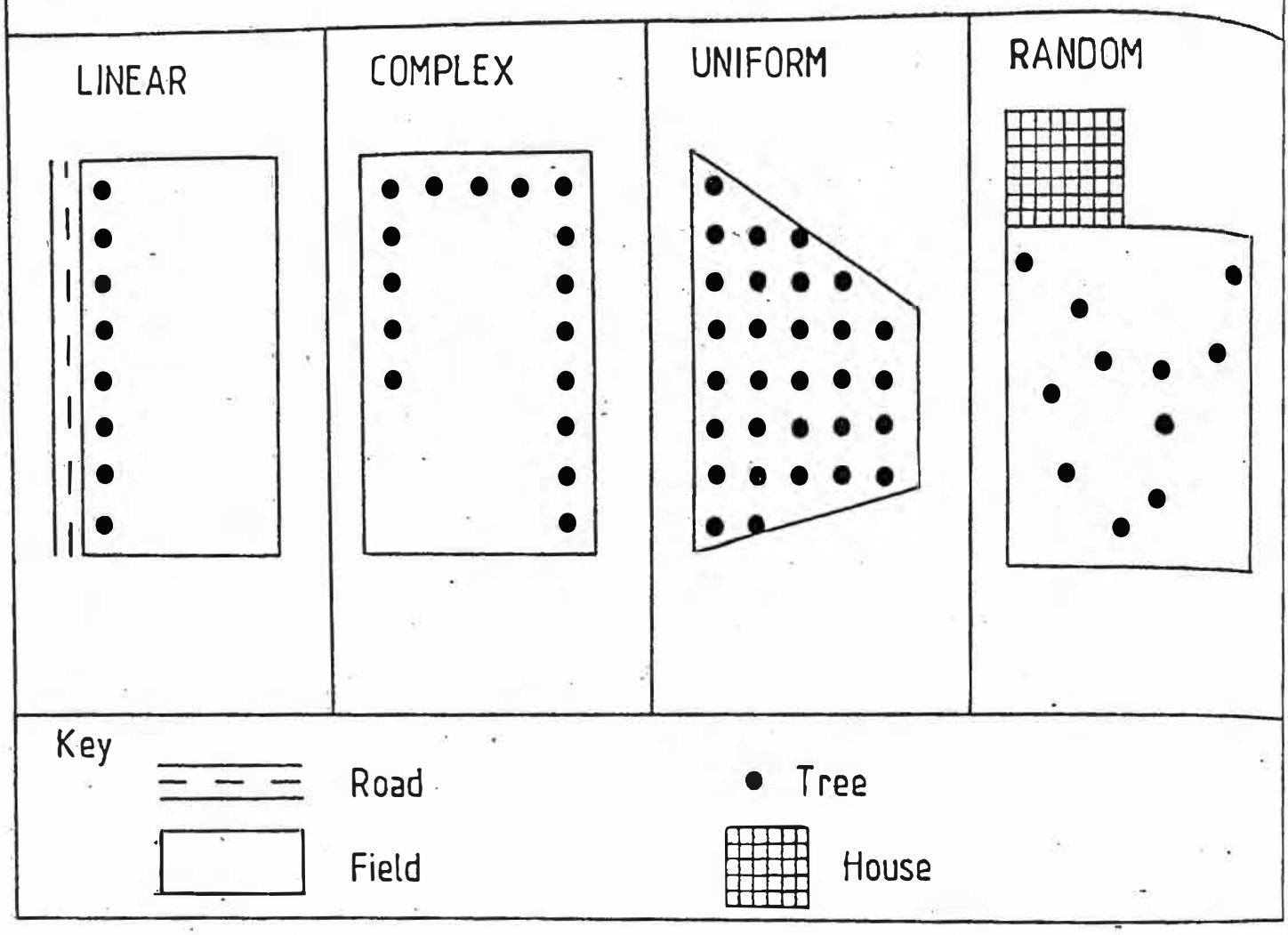
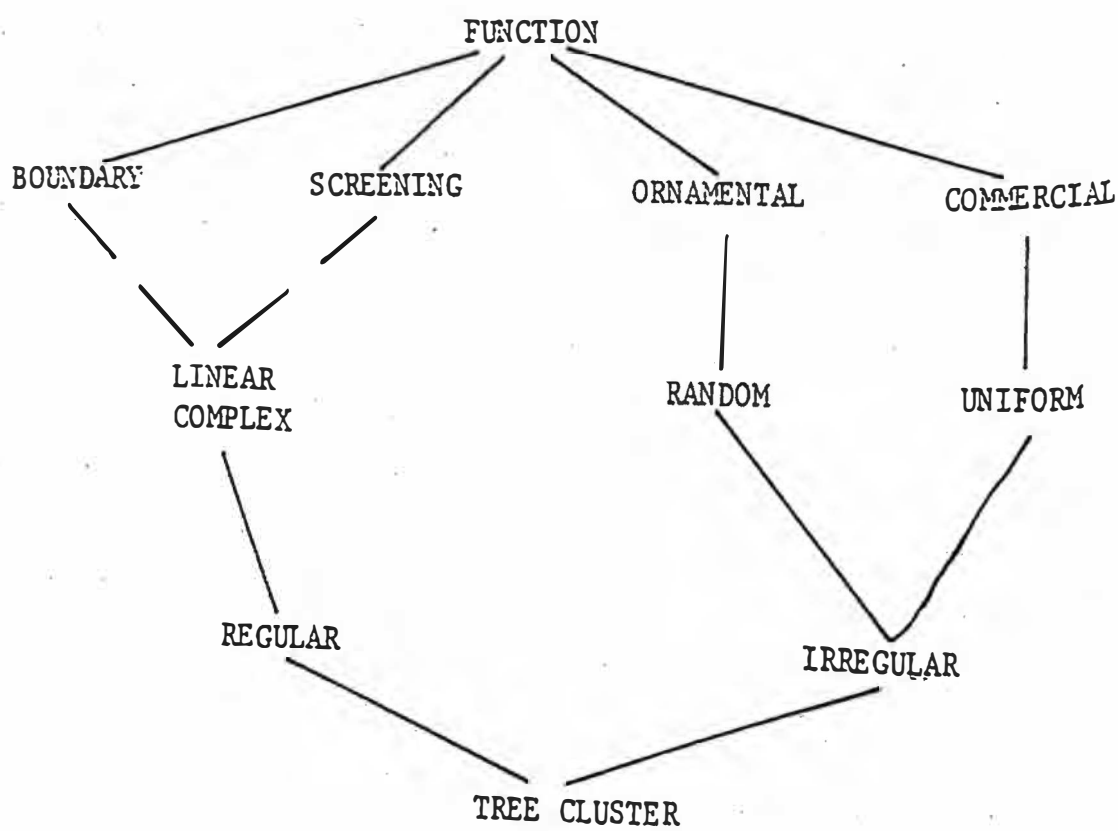


Figure 3 Function of Tree Clusters Related to Morphology



random clusters which occur are ornamental or aesthetic in function whether they occur in landscaped parkland or in a back garden. In terms of distribution, linear and random cluster numbers increase with rurality whereas complex clusters peak in the rururban fringe. In 1905 deciduous trees declined marginally to 445 trees. However, this represents a percentage increase to 89.4% of the total tree cover. These 445 trees occur again in 57 clusters of which 29 are linear, 24 are random and 24 are complex. Spatially this represents an increase of boundary functions with rurality, however, the ornamental function of trees also increases with rurality but not as sharply. From 1842 to 1905 only 79 deciduous trees survived. Of these survivors, 52 occurred in part of a large estate consisting of an ornamental garden and extensively landscaped parkland which is located in the rururban fringe and rural area.

By 1986 deciduous tree numbers rose substantially to 1,665 which represents 59.4% of the total tree population. These 1,665 trees occur in 130 clusters of which 63 are linear and 28 are complex. These 91 clusters all serve boundary functions. The remainder of the clusters are random in shape and ornamental in function. Random clusters dominate in the urban core which shows the aesthetic importance of trees. Boundary function becomes dominant in the rururban fringe. This trend continues in the rural area, although again there is some increase in ornamental tree uses. From 1905 to 1986 there are 195 deciduous survivors which constitutes a 39.2% survival rate. Spatially most of the survivors occur in the rururban fringe and rural area. Between 1842 and 1986 only 53 trees survived. Of these trees, 31 occur in the rururban fringe and 19 in the rural area. The rururban fringe seems to be the optimum area for tree survival which is surprising considering that this is a most dynamic area where land-use and land-ownership are subject to constant and regular change.

Coniferous Trees These can be defined as trees which produce cones as fruit and stay evergreen throughout the year. The coniferous tree population of Cahir town is in a state of continuous change throughout the survey period (Table 2). In 1842 coniferous trees occurred 117 times which constituted 13.8% of the total tree cover. These occurred in 18 clusters, 8 of which are irregular random in shape and were ornamental in function. Of these, 5 clusters occur in part of Lord Cahir's estate also known as the Earl of Glengall, the local landlord.

Table 1. DECIDUOUS TREE NUMBERS AS A PERCENTAGE OF TOTAL TREE NUMBERS AND INTER-TEMPORAL SURVIVAL RATES

	Deciduous Tree Numbers	Total Tree Numbers	% Deciduous	Inter-temporal Survival	Inter-temporal % Survival
1842	447	850	52.6%	1842	1842
				79	17.7%
1905	445	498	89.4%	1905 50	1905 11.2%
				195	39.2%
1986	1,665	2,805	59.4%	1986	1986

Table 2 CONIFEROUS TREE NUMBERS AS A PERCENTAGE OF TOTAL TREE NUMBERS AND INTER-TEMPORAL SURVIVAL RATES

	Coniferous Tree Numbers	Total Tree Numbers	% Coniferous	Inter-temporal Survival	Inter-temporal % Survival
1842	117	850	13.8%	1842	1842
				4	3.4%
1905	24	498	4.8%	1905 1	1905 .8%
				6	25%
1986	1,050	2,805	37.4%	1986	1986

Table 3 CULTIVATED TREE NUMBERS AS A PERCENTAGE OF TOTAL TREE NUMBERS AND INTERTEMPORAL SURVIVAL RATES

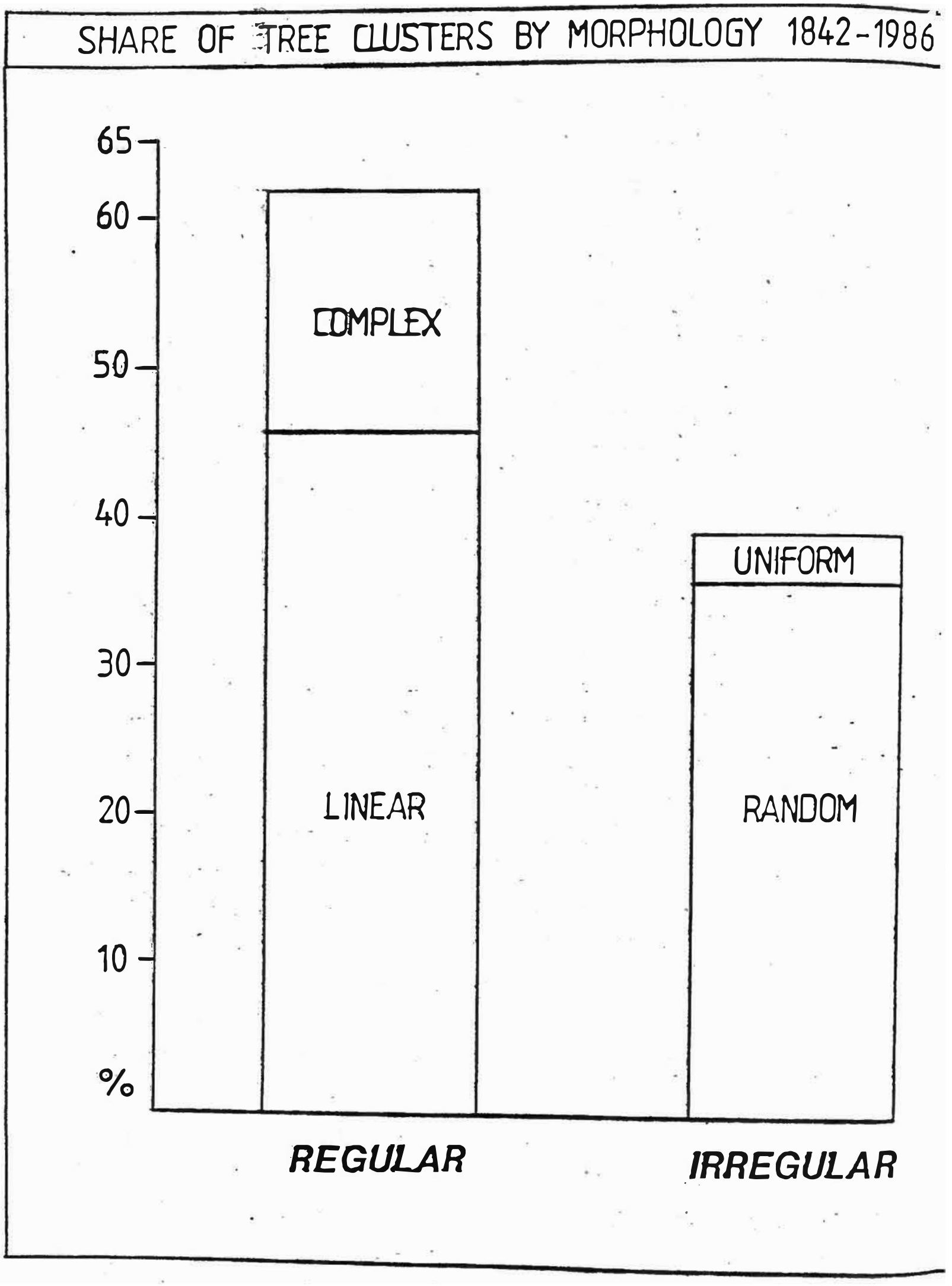
	Cultivated Tree Numbers	Total Tree Numbers	% Cultivated	Inter-temporal Survival	Inter-temporal % Survival
1842	286	850	33.6%	1842	1842
				29	10.1%
1905	29	498	5.8%	1905 0	1905 0%
				0	0%
1986	88	2,805	3.1%	1986	1986

This estate was extensively planted and landscaped from 1800 to 1810. Of the remaining 10 clusters, 8 are regular linear and function as boundaries. The final 2 clusters are most adequately categorised as complex clusters. Locationally, 63% of the coniferous trees occur in the rural area. By 1905 coniferous tree numbers had declined to only 24 (in 7 clusters) which constituted only 4.8% of the total. Spatially all bar one of the clusters occurred in the rural area. Of the 7 clusters, one each is complex linear, regular linear with a screening function, regular linear with a boundary function. The remaining clusters are irregular random or ornamental in function. In terms of inter-temporal survival, only 4 trees survived from 1842 to 1905, a survival rate of 3.4%. All 4 survivors were ornamental in function and occurred in the rural area.

By 1986, coniferous tree numbers had jumped dramatically to 1,050. This represented 37.4% of the total tree cover. These 1,050 trees occurred in 61 clusters, of which 38 were regular linear in morphology or boundary in function, 6 were regular complex or boundary in function also with the possible exception of cluster (1) 1986, which is in a shape and consists of 605 trees. This cluster contained 57.6% of all the coniferous trees in 1985. Functionally it can be seen to be both boundary and screening as it shields an estate house from the local Catholic graveyard, but also delimits the extent of the estate in that direction. The remaining 17 clusters are irregular random or boundary in function, many of which occur in landscaped parkland. Locationally, the numbers of coniferous trees rise with rurality. Functionally, there is a balance between boundary and screening tree uses in the urban core. In the rururban fringe, boundary tree uses become more important. This increases in the rural area with boundary tree uses predominating although some element of ornamental tree use remains. Only 6 trees survived from 1905 to 1986 which represents a 25% survival rate. Of these, 5 trees occur in the rural area. Over the whole of the survey period, from 1842 to 1986, only 1 tree survived which gives an 0.8% survival rate. This tree is located in the rural area.

Cultivated Trees These can be defined as trees which are planted for the sole purpose of yielding a crop, usually fruit. In 1842 cultivated trees occurred 286 times which represents 33.6% of the total (Table 3). Even though absolute tree numbers increased from 29 to 88 (7 clusters) between 1905 and 1986, this represented a percentage decline from 5.8%

Figure 4


SHARE OF TREE CLUSTERS BY MORPHOLOGY 1842-1986
65
60
50
40
30
20
10
%
COMPLEX
LINEAR
UNIFORM
RANDOM
REGULAR
IRREGULAR

to 3.1%. In 1842 all the seven clusters were irregular-uniform in morphology, and were semi-commercial in function. In terms of location, half of the clusters occurred in the rururban fringe, 2 in the urban core and 1½ in the rural area.

By 1905 only 1 cluster had survived. This was composed of 29 trees. This was all that remained of a larger cluster of 103 trees in 1842. This cluster occurred in the rural area. In 1986 88 cultivated trees occurred in 11 clusters. These consisted of a number of large and small clusters, the large clusters being irregular-uniform or semi-commercial in function. The smaller ones, not having enough trees to be commercial, were random in morphology. The harvest from these trees were for home use only. Spatially again most clusters (including all of the commercial clusters) occurred in the rururban fringe. While 10.1% of cultivated trees survived from 1842 to 1905, there were no survivors from 1905 to 1986.

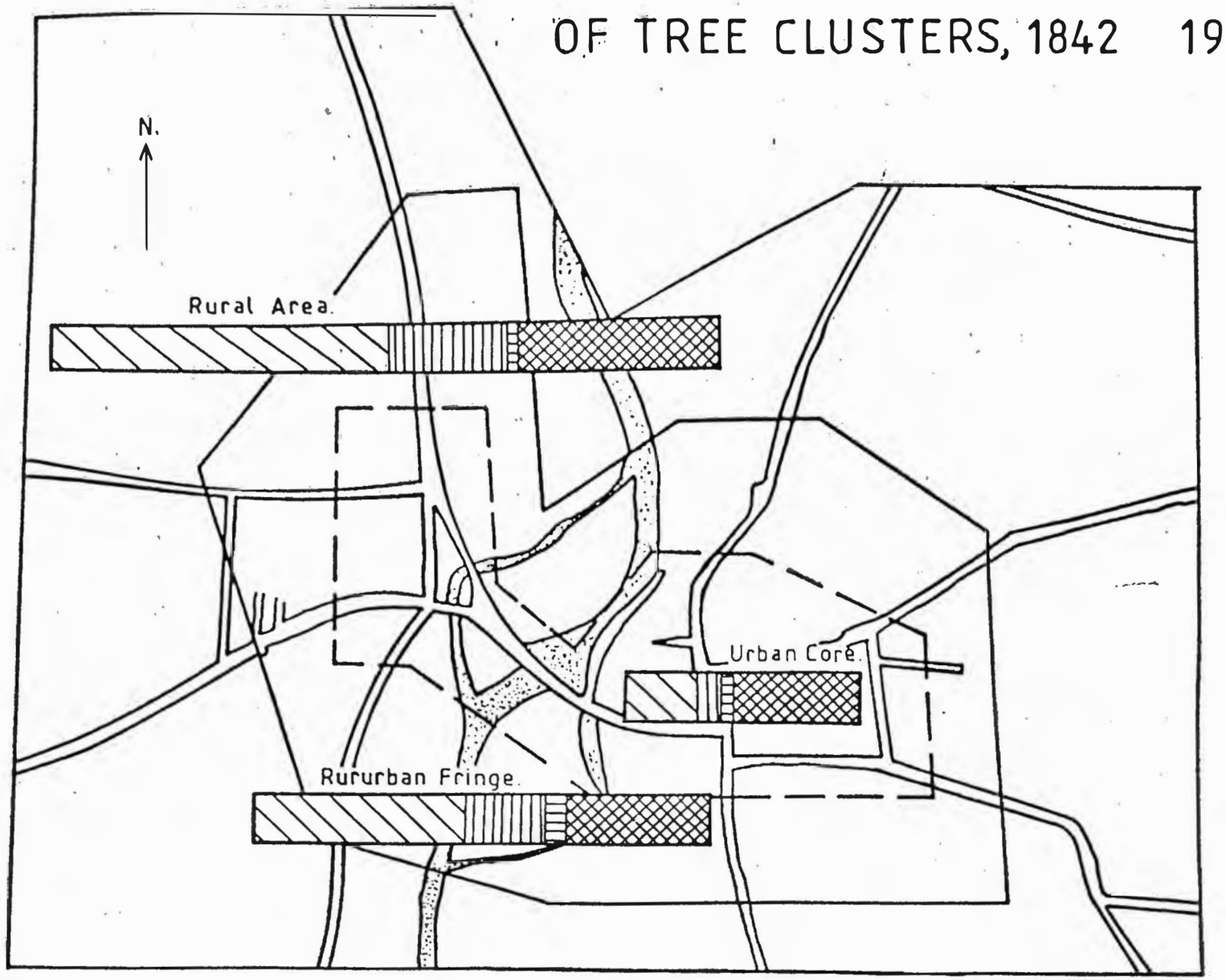
Patterns and Trends A strong indication of the changing dynamics of treescape in Cahir town and environs from 1842 to 1986 can be gained by examining the overall patterns of change and the various trends that comprise these patterns. Firstly, cluster size was examined. From 1842 to 1905 cluster size declines from 10.33 trees per cluster (on average) to 2.55. In 1986 cluster size has again increased to 13.88 trees per cluster. Both coniferous and deciduous tree trends follow this pattern while the cultivated tree trend shows a continuous decline in cluster size. This is primarily due, it could be argued, to their changing function from semi-commercial to supplying domestic needs only.

In the study in total, there were 349 clusters of trees (Fig. 4). In terms of shape, 158 clusters were linear, 122 were random, 58 were complex and 11 were uniform. When this is converted into tree use or function, boundary functions predominate with 204 clusters followed by the ornamental function (122 clusters), commercial function (11 clusters) and finally, screening function (2 clusters).

The next area of analysis was the relationship between the shape of tree clusters and where they occur (Fig. 5). The overall pattern was that of a rising number of clusters as one ventured from the urban core to the rural fringe. The linear, complex and random categories of clusters show the same trend. Uniform clusters, however, peak in the

Figure 5

RELATIONSHIP BETWEEN LOCATION AND MORPHOLOGY OF TREE CLUSTERS, 1842 1986.



rururban fringe where there is room for large gardens and plenty of trees.

As regards the historical change of tree types (Fig. 6) related to the shape of the clusters, complex, uniform and random clusters all exhibit the same overall pattern of decline from 1842 to 1905 followed by an increase by 1986. Linear clusters, however, show a pattern of continuous increase, possibly due to the break-up of some of the old large estates and the creation of many smaller holdings.

When these overall patterns are broken down by tree type, some interesting trends emerge. Cultivated trees only occur in random and uniform clusters, throughout the survey period. The bulk of the cultivated trees occur in uniform clusters (Fig. 7). The linear clusters made up of coniferous trees show a decline from 1842 to 1905 and then an increase by 1986. This, however, is not typical of the overall linear cluster pattern which is one of continuous increase. The probable cause of this is the removal of many coniferous trees between 1842 and 1905. The coniferous complex clusters and coniferous random clusters show trends typical of the overall complex and random patterns. As for deciduous trees and the shape of their clusters, linear and complex trends followed those of their respective overall patterns, whereas the random deciduous trend does not.

The location of different types of clusters was examined next (Figs. 8, 9, 10). The pattern that emerged indicated that linear, complex and random clusters increased in frequency as one progressed from an urban to a rural area. The uniform pattern peaks in the rururban fringe. The cultivated uniform trend follows the overall uniform pattern whereas the cultivated random trend does not by peaking in the rururban fringe. The coniferous linear, complex and random trends follow their respective overall pattern, that of continuous increase with rurality, as do the deciduous linear, complex and uniform trends and patterns.

In the study area there is a reasonable level of survival of trees between one time period and another, enough to establish some patterns and trends. From 1842 to 1905 112 trees survived which is a survival rate of 13.1%. Of these 112 trees survived which is a survival rate of 13.1%. Of these 112 trees, 29 were cultivated, 4 were coniferous and 79 were deciduous, showing the dominance of deciduous trees as survivors. From 1905 to 1986 there were 201 surviving trees out of a possible 498 which is a 40.36% survival rate, a significant increase on

Figure 6

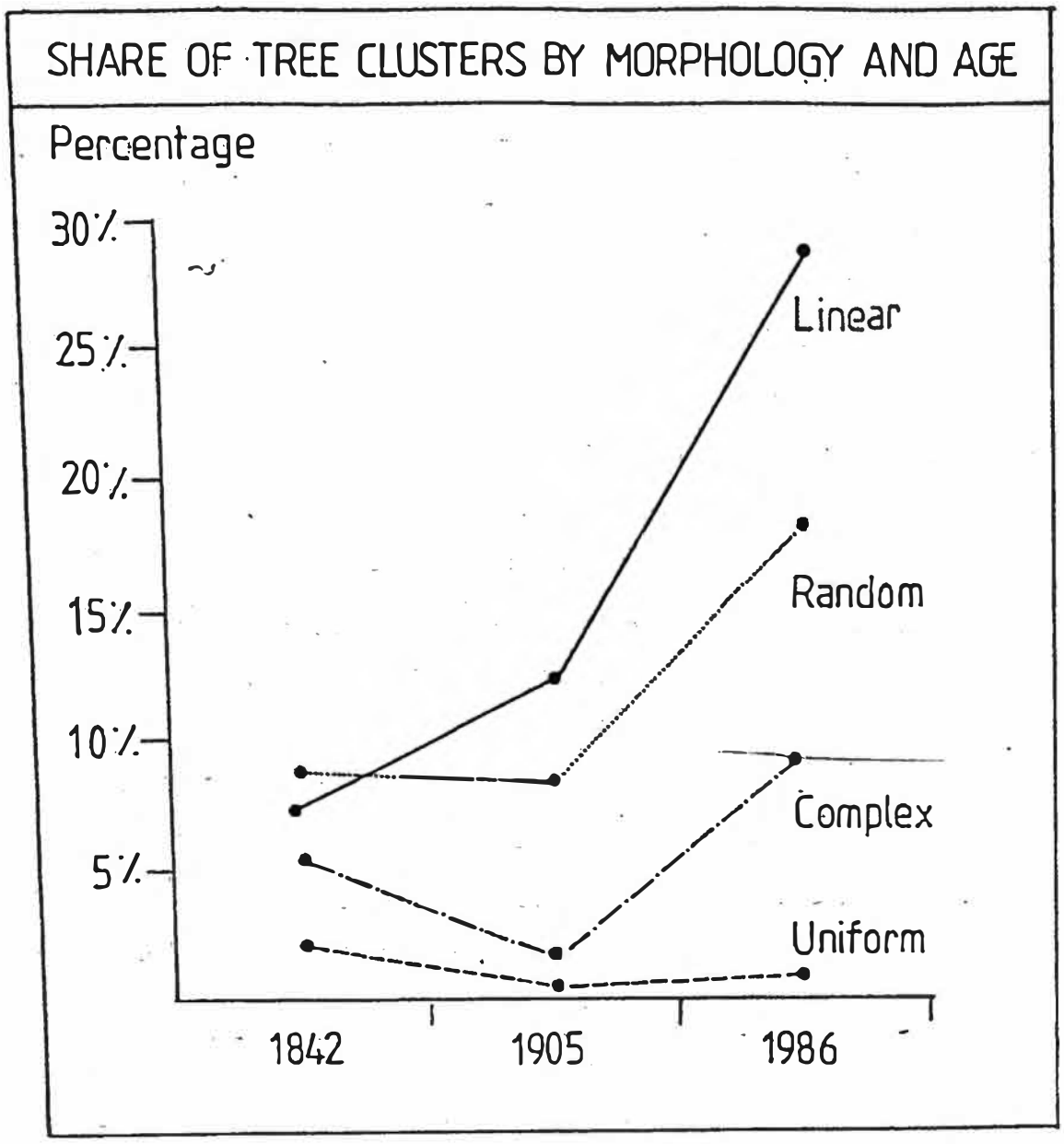


Figure 7 SHARE OF CLUSTERS BY MORPHOLOGY AND TREE TYPE 1842 to 1986

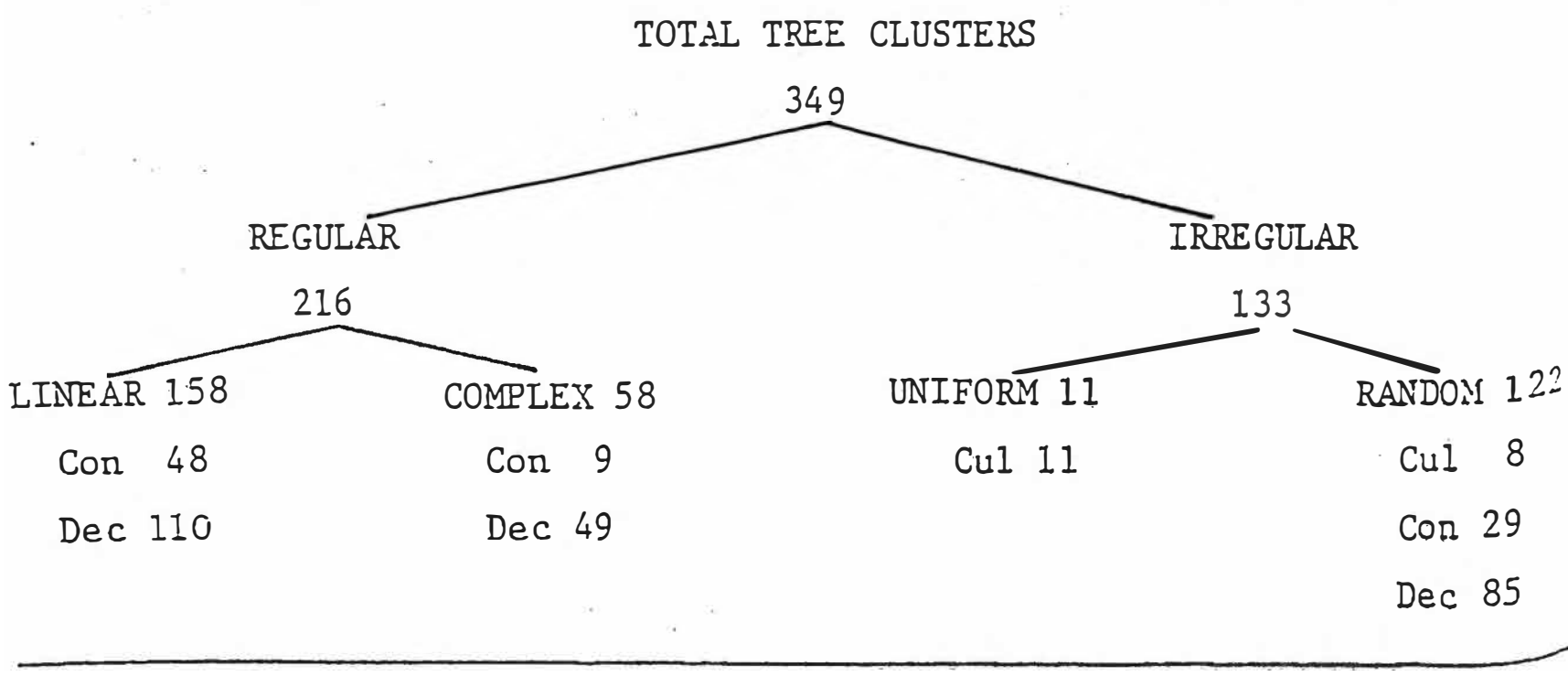
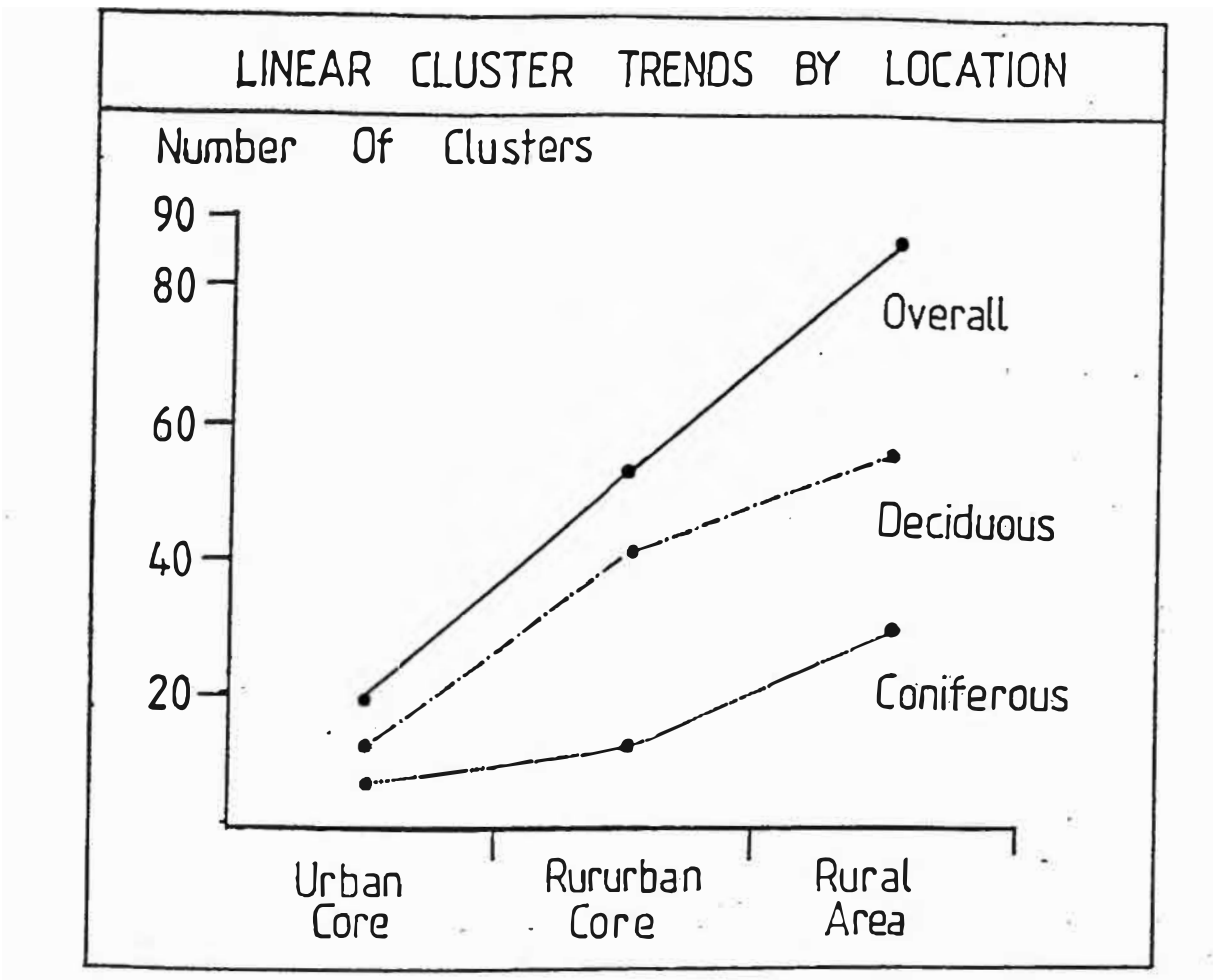


Figure 8


LINEAR CLUSTER TRENDS BY LOCATION
Number Of Clusters
90
80
60
40
20
Overall
Deciduous
Coniferous
Urban Core
Rururban Core
Rural Area

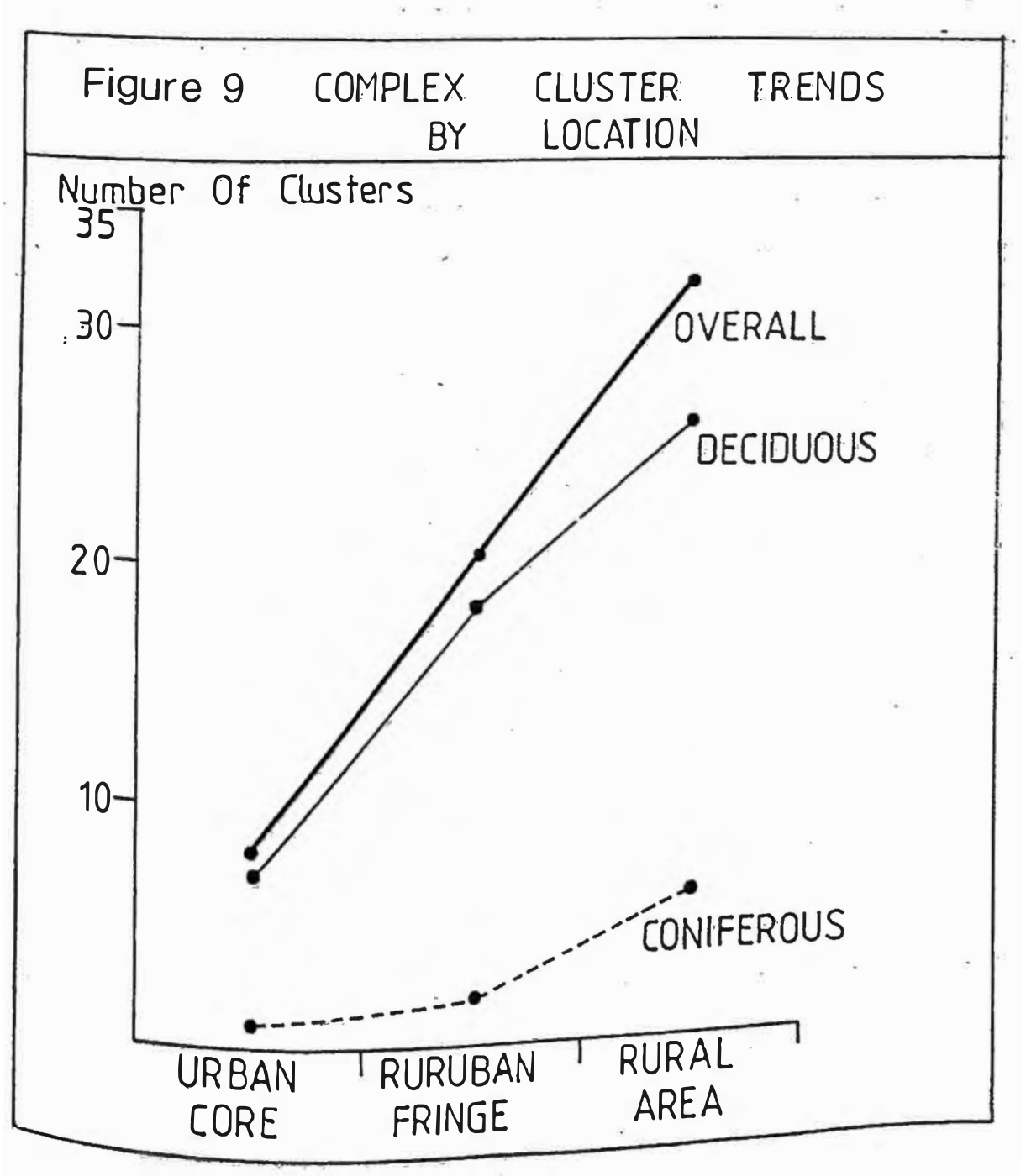


Figure 9 COMPLEX CLUSTER TRENDS BY LOCATION
Number Of Clusters
35
30
20
10
OVERALL
DECIDUOUS
CONIFEROUS
URBAN CORE
RURUBAN FRINGE
RURAL AREA

the 1842 to 1905 rate. Of these 201 survivors, again deciduous dominated with 195 and coniferous with 6. Overall, from 1842 to 1986 there were 51 survivors of which 50 were deciduous, the other being coniferous.

The location of these surviving trees shows a distinctive pattern. From 1842 to 1986 there is an increase of survivors with rurality. Of the 112 survivors from 1842 to 1905, 4 occur in the urban core, 38 in the rururban fringe and 70 in the rural area, probably the most stable environment of all three. The situation is different with the survivors from 1905 to 1986 with 23 occurring in the urban core, 90 in the rururban fringe and 88 in the rural area, here the rururban fringe is most important but only just. From 1842 to 1986 the 51 survivors occur in two areas, 31 in the rururban fringe and 20 in the rural area. Over the whole of the survey period from 1842 to 1986, again most survivors occur in the rururban fringe, which is surprising in that this represents the area of most land-use and land ownership change, but possible not the area of most boundary change.

Most of the surviving trees, however, occur in parts of the two estates around Cahir town throughout the survey period (Fig. 11). Both these estates consist of planted parkland and very little change as regards treescape has occurred in these since the early 1800's. From 1842 to 1905, 57.1% of surviving trees occurred in these two estates. This rises to 81.6% of surviving trees between 1905 and 1986. In terms of overall survival between 1842 and 1986, these two estates are even more dominant with 96% of the survivors occurring in the estates.

Conclusion A continuously changing pattern of tree occurrence has been established for Cahir town and its environs from 1842 to 1986. While tree numbers declined from 1842 to 1905, this was followed by a massive increase by 1986. The composition of the tree types changes considerably, but deciduous trees remain dominant throughout. Interesting patterns emerge when the trees are grouped into clusters. Four types of clusters are found within the survey area with linear clusters most frequent followed by random, complex and uniform in that order. The clusters were examined in terms of tree type. Deciduous and coniferous trees occurred in linear, complex and random clusters, whereas cultivated trees occur in uniform and random clusters. In terms of spatial distribution there is a rising number of clusters with rurality..

Figure 10 RANDOM CLUSTER TRENDS BY LOCATION

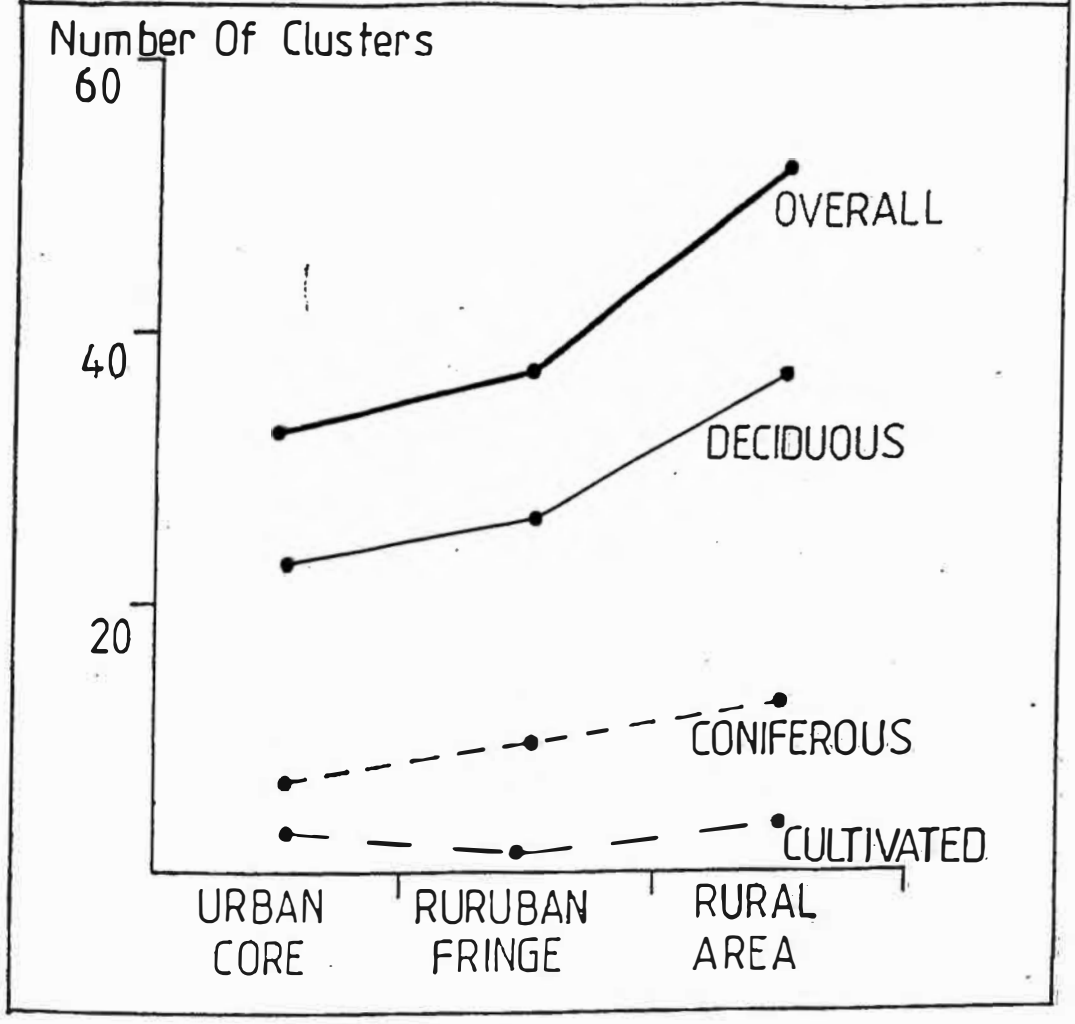
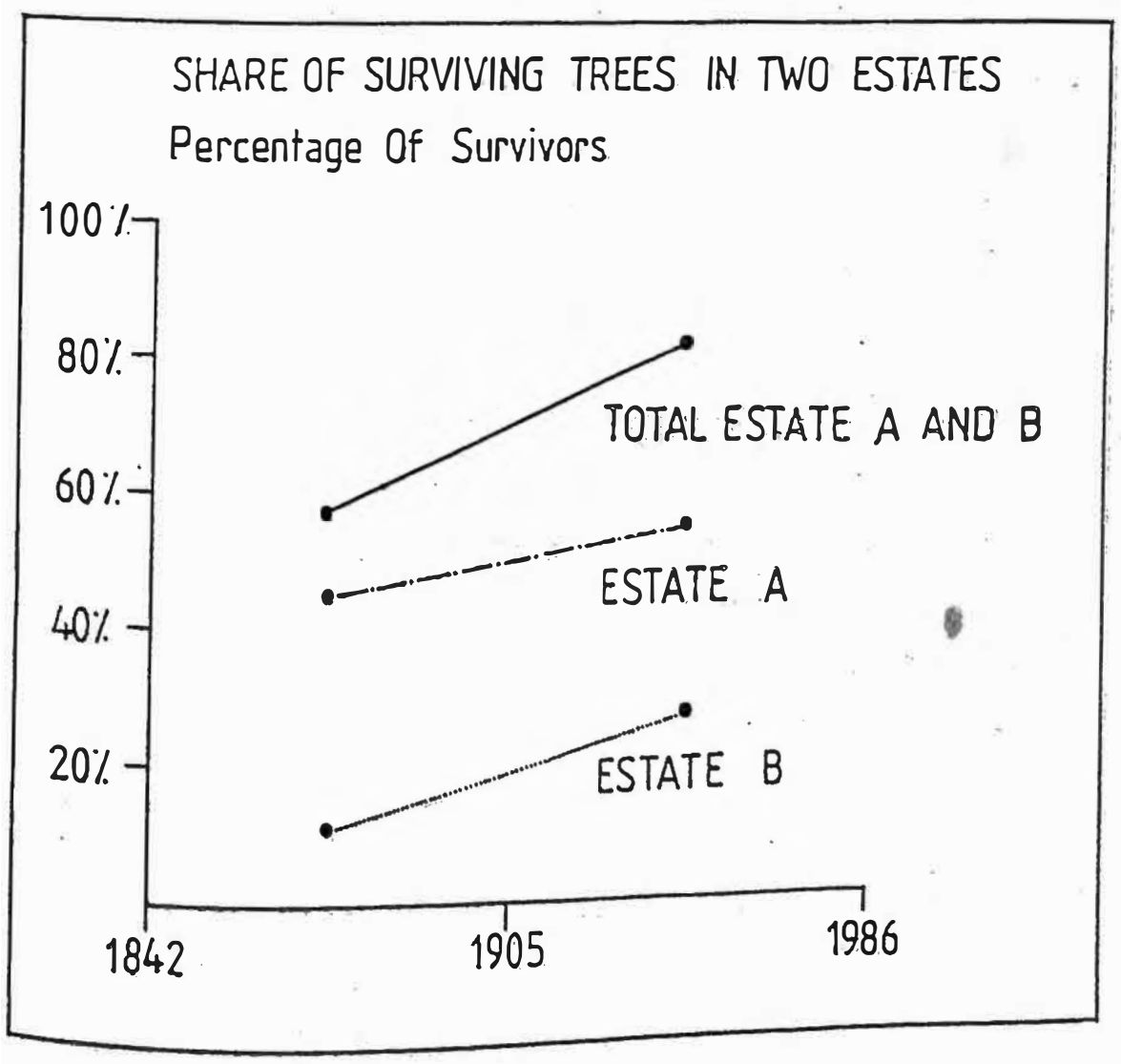


Figure 11



The clusters were also examined historically with overall declining numbers of clusters from 1842 to 1905 followed by an increase by 1986. In terms of tree type, temporally the linear coniferous cluster trend follows this overall pattern while the linear deciduous cluster trend shows a continuous increase. The morphology of tree clusters can also be related to the function of tree clusters. Functionally, linear, and complex clusters can have a boundary or a screening function. Random clusters have an ornamental function whereas cultivated trees can have either a commercial or ornamental function. Overall boundary functions are most important in the survey area followed by ornamental, commercial and screening respectively. Boundary functions of trees occur mostly in the rural area, whereas ornamental functions are distributed fairly evenly over the whole of the study area. Inter-temporal survival of trees was also examined. Deciduous trees are the most frequent survivors whereas the optimum area for tree survival is the rururban fringe, particularly in old estate parklands.

In conclusion, it can be stated that a very complex pattern of change in the treescape has emerged from this study of the distribution of trees in Cahir town and environs from 1842 to 1986.

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