G R A H A M S T O W N

A SOCIO-ECOLOGICAL STUDY OF A SMALL SOUTH AFRICAN TOWN.

V O L U M E I I

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Doctor of Philosophy

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by

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V O L U M E I I

PRESENT-DAY GRAHAMSTOWN ITSELF.

INTRODUCTION

In Volume I of this study of Grahamstown, the historical background, and regional setting and regional influences of the town were analysed. In this volume, the present-day town itself is studied, and the demographic and ecological structure of the town are analysed. Finally, the conclusions of the study as a whole are presented.

In studying any community, one of the first problems which arises after the field to be investigated has been delimited, is what methods should be used for the collection of the required data. Choice of methods is partly determined by the nature of the investigation, and more especially by the existence or absence of existing sources of information. Often the methods used play a part in determining the reliability or otherwise of the data finally collected. It is important therefore for any research worker to give a report on the methods used for undertaking a particular piece of research. After due consideration it was decided to relegate this discussion and the problems associated therewith to appendices, so as not to interrupt the presentation of the material dealing with Grahamstown. The reader is thus referred to Appendices F to H , especially Appendix G which gives a description and critical evaluation of the sample survey of Grahamstown.

The data presented in this volume about the town itself falls into two sections - first of all a demographic section is presented, and then an ecological section, which includes

an analysis of the spatial patterns evinced by the demographic data presented in the first section. Together the two sections give some idea of the nature and structure of the present-day town. As was pointed out on page 2 above, the analysis is monographic in nature, and comparisons are introduced only when required to throw light on the particular features of Grahamstown. It is not possible to undertake a comparative study until similar pieces of research have been undertaken in South Africa, so that a pattern for small South African towns begins to emerge.

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P A R T II

PART B : THE DEMOGRAPHIC STRUCTURE OF GRAHAMSTOWN:

CHAPTER XI

THE POPULATION OF THE EUROPEAN AREA OF GRAHAMSTOWN 1951 - 1952.

1. The Growth of the Town's Population:

At the time of the 1951 Census, Grahamstown had a total population of 23,767 persons within the Municipal boundary of the town. This population was composed of 8,680 Europeans, 178 Asiatics, 3,117 Coloureds, and 11,792 Natives.(1) The town's European population ranked thirty-first among the 98 towns of over 2,000 population in the Union of South Africa,(2) which means that as far as its European population is concerned, Grahamstown, while being a small town as sizes in the Western world go, is nevertheless not small as far as the South African towns are concerned. Comparative figures for the size of the population of Grahamstown at the time of other Censuses are shown in Table V over the page:-(3)

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(1) Bureau of Census and Statistics: Special Report No. 200: Geographical Distribution of the Population, 8th. May 1951: Government Printer, Pretoria: p. 17.

(2) Ibid: pp. 15-24, and p. 4.

(3) The figures for the years other than 1951 are taken from Vol. I of the 1946 Census report: Geographical Distribution of the Population of the Union of South Africa: U.G. 51 - 1949: p. 51. The figures for 1921 are the earliest ones given in this report.

TABLE V.

POPULATION OF GRAHAMSTOWN AS SHOWN BY DIFFERENT CENSUSES

YEAR	EUROPEANS	ASIATICS	COLOUREDS	NATIVES	TOTAL
1921	7,237	143	1,898	5,631	14,909
1936	8,198	122	2,322	9,131	19,773
1941	7,541	-	-	-	-
1946	9,054	181	2,884	10,874	22,993
1951	8,680	178	3,117	11,792	23,767

The figures shown above are graphed in Figure II over the page. As the figures are graphed on a semi-logarithmic scale, they show the RATE of growth of the population, and make a comparison of the trends of growth for the different racial groups possible.(4)

Examining first of all the European curve, we find that the overall trend has been one of a slow increase in the number of Europeans in the town. It must be remembered that the European population of the town includes several thousand scholars and students whose home towns are external to Grahamstown.(5) Thus, changes in the size of the European population of the town can be due to changes in the number of scholars and students attending the educational institutions of the town, and/or changes in the number of Europeans permanently living in the town. Furthermore, as the South

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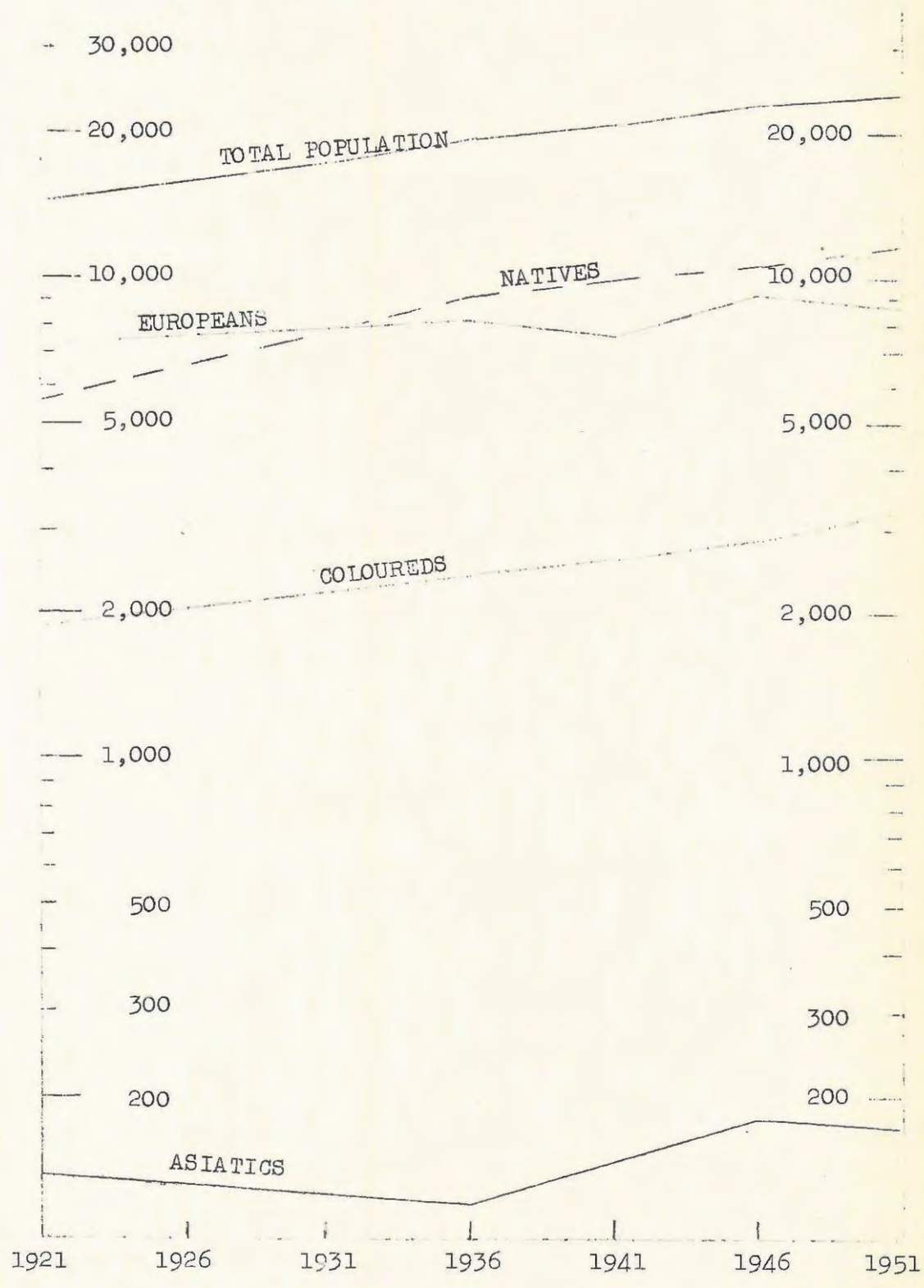
(4) A graph with arithmetic scales does not show the rate of growth, but only the absolute amounts by which growth takes place. Thus, it is impossible to tell if the rate of growth is constant or not, and furthermore, trends for populations of different sizes cannot be compared. A graph with a semi-logarithmic scale does not have these disadvantages. (See e.g. W.A. Neiswanger: Elementary Statistical Methods: as Applied to Business and Economic Data: Macmillan, New York: 1943: Ch. VII.

(5) See Vol. I, pp. 161 - 163 above.

FIGURE II.

POPULATION TRENDS IN GRAHAMSTOWN, FROM CENSUS DATA, 1921 - 1951.



African census is a "de facto" and not a "de jure" census, the fact whether or not the census was taken while some of the schools and colleges in the town were at the time closed for the vacation, will also influence the census figures for the European population in the town. These facts must all be borne in mind when attempting to interpret the trend and fluctuations portrayed in Figure II. It is not possible, without a special investigation, to state whether or not the slow increase in the European population of Grahamstown is due to an increase in the number of the permanent European residents in the town, and/or an increase in the number of students and scholars in the town. The impression of the writer is that in actual fact this increase was due to both factors.(6) However, with the available data it is not possible to substantiate or disprove this impression. The fluctuations in the graph are probably to be explained by the war and its after-effects. During 1941 the number of students in the town dropped sharply due to the recruitment demands of the war, and it is very likely that the permanent European population of the town was similarly affected. The peak in the number of Europeans in the town in 1946 is

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(6) In 1952, when the writer interviewed the heads of the various educational institutions in the town, more than once it was reported that a school or college was fuller than it had been for years. Both the records of the University and Training College reveal that during the period 1921 - 1951 the number of students increased appreciably. Further, since the war, a pottery, brickworks, a small lamp factory, and several other minor manufacturing concerns have come into existence, so that it is likely that the number of permanent residents in the town also increased. It is thus argued that both factors were operating at once.

due to the return of ex-servicemen and women to the town, and the record number of students at the town's University and Training College.(7) With the decline in this exceptional number of students, the population dropped to its 1951 level.

The Asiatic population of the town is practically negligible in size - less than 200 in number, and only 0.75% of the total population of the town, so that the numbers are too small to make any fluctuations in them significant - with so small a population, the chance of random fluctuations is great. Suffice it to say that there has been an overall increase in the size of the Asiatic population in the town.

Both the Coloured and Native populations of the town have increased steadily in size over the period under review, and unlike the European group, show no marked fluctuations. The rate of increase of both races has been approximately the same, except that the growth of the Native population has slackened off slightly, whereas that of the Coloured population has increased slightly. To all intents and purposes however, both races have maintained a constant and equal rate of growth - their trend could be described aptly by a geometric straight line.

Comparing the proportion of Europeans in the total population of Grahamstown at different periods, we find that in 1921 48.5%, or almost half of the population, consisted of Europeans. In 1936 the figure had dropped

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(7) This exceptional number of students was due mainly to ex-servicemen and women catching up on their education after the war, and also to a temporary increase in the number of civilian students at these institutions.

to 41.4%, and in 1946 to 30.9%; in 1951 Europeans formed 32.5% or about a third of the population of Grahamstown. Thus during the thirty years 1921 - 1951 there has been a noticeable relative drop in the size of the European population of the town, even though absolutely this racial group has increased in size. The Non-European population of the town is therefore increasing in size more rapidly than the European population. This trend in discussed on pages 187 - 189 below.

The rate of increase in the size of the total population of the town has been maintained fairly steadily during the period under review, and shows no marked fluctuations. It does, however, show a slight tendency for the rate of growth to slacken off.

From Table V the increase in the size of the various racial groups in the town, and of the town's population as a whole between the periods 1921 and 1951 has been calculated. This has likewise been done for the Census figures for the total population of the Union of South Africa.(8) In each case the increase in population size during the thirty years 1921 to 1951 has been expressed as a percentage of the 1921 population size. Table VI below sets out the results:

SEE OVER THE PAGE

(8) The figures for the Union are calculated from the data given in Vol. I, 1946 Census Report (op. cit.), pp. 4 - 5, and Report No. 200 of the Bureau of Census and Statistics (op. cit.), p. 3.

TABLE VI.

A COMPARISON OF THE PERCENTAGE INCREASES FOR THE POPULATION OF GRAHAMSTOWN WITH THOSE FOR THE POPULATION OF THE UNION 1921 - 1951.

RACE	GRAHAMSTOWN		UNION OF S. AFRICA		RATIO $\frac{a}{b}$
	Increase 1921-51		Increase 1921-51		
	No.	% 1921 (a)	No.	% 1921 (b)	
EUROPEANS	1,443	19.94	1,123,225	73.92	0.27
ASIATICS	35	24.48	200,933	121.24	0.20
COLOUREDS	1,219	64.23	557,757	102.24	0.63
NATIVES	6,161	109.41	3,839,562	81.73	1.34
TOTAL FOR NON-WHITES	7,415	96.65	4,598,252	85.01	1.14
TOTAL POPULATION	8,858	59.41	5,721,477	82.58	0.72

If, for the sake of analysing the contents of this table, we assume that over the thirty year period 1921 - 1951 Grahamstown experienced the same growth in population as the Union experienced, then the percentage increase in the size of the various groups of the town's population would approximate to the percentage increase in the size of the various groups forming the Union's population, and the ratios in the last column of Table VI would be about 1.00. In the case of the total population of the town we see that the rate of growth from 1921 to 1951 was only 0.72 times, or about three-quarters of the relative rate of increase which occurred in the Union's total population. Absolutely the population of the town has grown in size during the past thirty years, but relatively it has decreased in size. Grahamstown is not therefore, an expanding urban area drawing a population to itself, but rather, in the light of these figures must be seen as

a static town whose population growth has not been able to keep up with that of the Union as a whole. Once was the time, when as the "Queen of the East" Grahamstown was attracting men and women to itself in large numbers, dominating a wide area. That however, was a century ago, and to-day Grahamstown is, demographically at least, retarded in growth.

Examining Table VI in greater detail, we may exclude the Asiatic group in the town as being too small in numbers to make it possible to draw any worthwhile conclusions. Of the other racial groups, the Europeans have had the lowest growth rate of all. During the thirty year period the European population of Grahamstown grew at only 0.27 times (or about one quarter) of the rate of growth of the Union's European population. This means that in terms of growth the European population of Grahamstown is the most retarded of the racial groups in the town, and that the degree of retardation involved is most marked.

The growth of the Coloured population in the town has also not equalled that of the Coloured population of South Africa, being only 0.63 times (or almost two-thirds of) the rate of growth for the Union as a whole. In sharp contradistinction to this, the Native group in the town has increased 1.14 times the rate of growth for the Union's Native population. It is not our purpose here to go into the matter of the respective contributions of immigration - emigration and natural increase or decrease to the growth of the various racial groups in the town's population, beyond stating that it seems likely that the relatively rapid growth of the Natives of the town has been due to an influx of rural Natives, rather than a rate of natural increase higher than

that exhibited by the Union, and that correspondingly the relatively slower growth in Grahamstown's Coloured population may be mainly due to migration of younger Coloureds out of the town to find work in Port Elizabeth's factories. As far as the European population is concerned, it will be seen later that the structure of this population in the city appears to be biased towards the older age groups and young people not eligible for reproduction, and that this as well as a probable migration of younger Europeans out of the town has kept the rate of growth down.

All these remarks indicate that the total population of Grahamstown, and all the groups within it except the Native group, did not, for one or more reasons, grow in size at a rate relatively equal to the rate of growth of the population of the Union of South Africa. This phenomenon definitely indicates a certain amount of stagnation and retardation in growth on the part of the town - the trend is clearly evident, and reflects an important aspect of the town's behaviour over the past thirty years, and may be taken as an index of significant processes involving the whole life of the town. During the first half of the last century Grahamstown drew to itself population from the surrounding towns and rural areas, but it is suggested that perhaps to-day the process is reversed, and that part of the retardation of the population growth of the town may be due to a drawing off of the town's population by other urban centres, such as Port Elizabeth, the town's metropolitan neighbour.

In attempting to trace the problem of the growth of the town's population from earlier than 1921, we find that

it is only possible to obtain figures for the European population, and the total population of the town, during the greater part of the time that the town has been in existence. The fact that we cannot study the growth of the various Non-European races is not particularly important, as our main concern is in any event with the European population. Most of the figures for the earlier years in the town's life are estimates only, and sometimes they present a conflicting picture. Sometimes it is not always easy to ascertain if the figures refer to the total population of the town, to the European section or purely to the European civilian population of the town. Despite these difficulties, it is nevertheless possible to obtain a picture of the trend in the growth of the town since its foundation. Table VII below gives those estimates for the town's population which seem to be the most reliable and consistent ones.

TABLE VII.

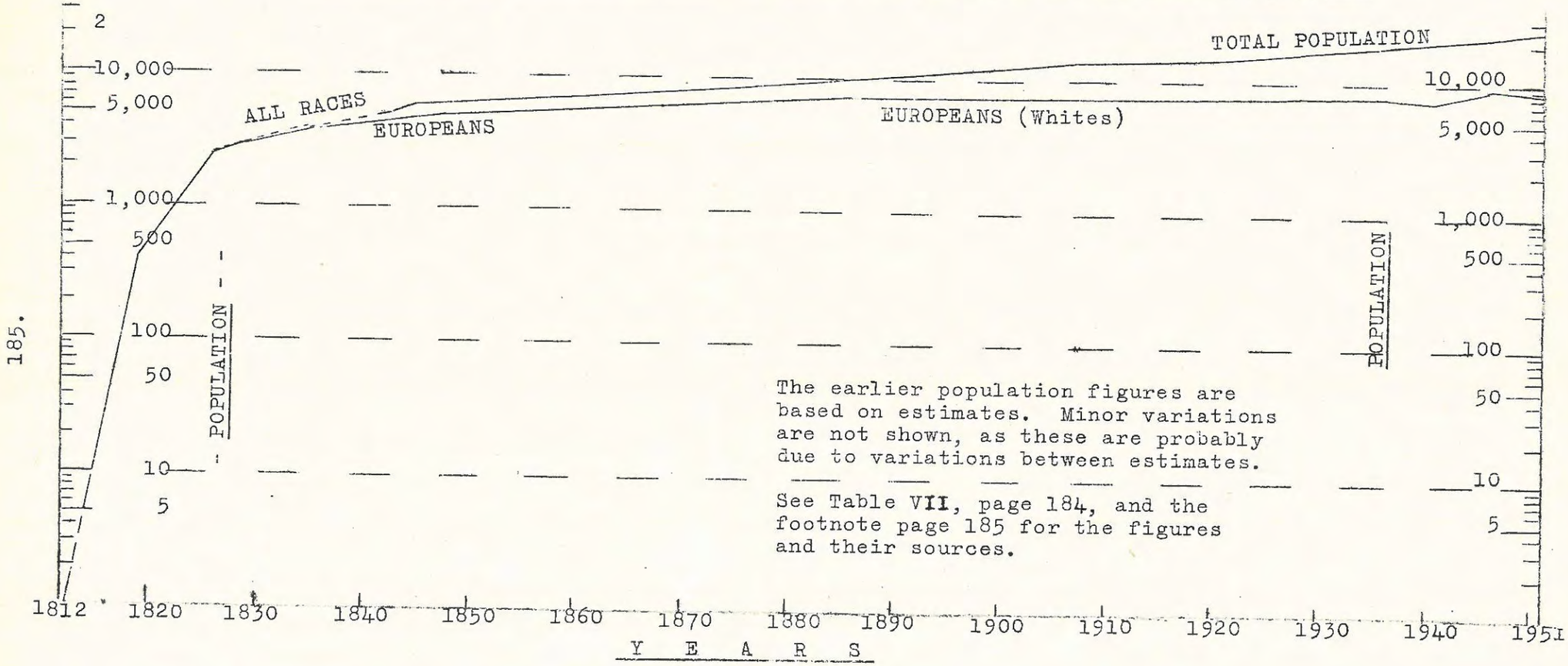
FIGURES AND ESTIMATES SHOWING GROWTH IN THE SIZE OF THE POPULATION OF GRAHAMSTOWN SINCE THE DATE OF ITS FOUNDATION IN 1812.(9)

YEAR	EUROPEANS	ALL RACES	YEAR	EUROPEANS	ALL RACES
1812	0	0	1877	5-6,000	8-9,000
1819	400	400	1880	6,933	?
1826	2,500	2,500	1886	7,000	10,000
1828-9	3,000	3,000	1907	7,288	13,892
1834	3,800	?	1919	7,323	13,830
1835	3,500	?	1921	7,237	14,909
1838	4,000	?	1935	7,602	?
1843	4,000	5,000	1936	8,198	19,773
1845	4,500	6,000	1941	7,541	?
1848	5,000	?	1946	9,054	22,993
1865	5,263	8,000	1951	8,680	23,767
1875	6,912	?			

(9) SEE PAGE 186.

F I G U R E III.

GROWTH OF THE POPULATION OF GRAHAMSTOWN SINCE ITS FOUNDATION IN 1812 TILL 1951.



The earlier population figures are based on estimates. Minor variations are not shown, as these are probably due to variations between estimates.

See Table VII, page 184, and the footnote page 185 for the figures and their sources.

In Figure III, page 185, the contents of Table VII are graphed. In graphing the data, the overall trend has been plotted rather than the fluctuations shown by various individual points, which for the most part reflect errors in the estimates of the size of the population.

A very clear picture of the growth of the European population of the town is given. Since about 1850 the rapid rate of growth of the town has ceased, and has been replaced by a steady but slow rate of growth. In the century after 1850, the European population of the town has now only just about doubled itself, which indicates

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(9) The sources of these various estimates and enumerations of the size of Grahamstown's population are as follows:

1819 - See p. 36, Vol. I above.
1826 - G. Thompson, op. cit., p. 26.
1828 - C. Rose, op. cit., pp. 45-6
1834 - J. Noble, op. cit., p. 187.
1835 - T. Pringle: Narrative of a Residence in South Africa: 1835: p. 225.
1838 - J. Backhouse: op. cit., p. 174.
1843 - J.C. Chase: op. cit., pp. 39-43.
1845 - The Cape of Good Hope Annual Register, 1845.
1848 - G. Nicholson: The Cape and its Colonists: 1848: pp. 109 - 111.
1865 - Rev. W. Taylor, op. cit., p. 62.
1875 - J. Noble: op. cit., p. 187.
1877 - Anthony Trollope: South Africa: 1878: Abridged Edition, 1938, p. 72. (Not given in table.)
1880 - The General Directory and Guide Book to the Cape of Good Hope for 1880: p. 387.
1886 - The Official Handbook of the Cape of Good Hope for 1886: p. 102.
1907 - A.R.E. Burton: The Cape Colony To-day: 1907: p. 169.
1919 - Donaldson's and Braby's Cape Directory for 1919: p.1,029 ff.
1921 - Vol. I, 1946 Census Report, op. cit., p. 51.
1935 - The Cape Times South African Directory for 1935: pp. 613 ff.
1936 - Vol. I, 1946 Census Report, op. cit., p. 51.
1941 - Ibid.
1946 - Ibid.
1951 - Special Report No. 200, Bureau of Census and Statistics, op. cit., 17.

the static nature of the town. By contrast a city such as Durban is at the present time doubling its European population about every twenty years, and earlier in its history the rate was even faster.(10) This graph thus bears out what has already been said about Grahamstown in the section on the historical background of the town. If we examine the rate of growth of the European population at various dates, it is possible by using a pair of dividers to estimate the rate of growth from the logarithmic scale on which the growth is plotted. From 1819 to 1826 (the period affected most strongly by the 1820 Settlement) the European population of Grahamstown doubled about every three years. From 1826 it took twenty odd years for the European population to double by 1848, whilst from 1850 to 1880 growth was at the rate of doubling in about 60 years. Finally, from 1880 to the present time, the European population has been growing at the rate of doubling in approximately 125 years. It was towards the end of the 1870's that the editor of the "Graham's Town Journal" remarked that the town seemed to be doomed to be a "sleepy hollow".(11) Certainly from about this time the European population of the town experienced an increased degree of stagnation in its growth.

The growth in the total population of Grahamstown is also portrayed in Figure III. Up to about 1845 the total population of the town grew at a rapid pace. From 1845

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(10) Calculated from population figures supplied in the Annual Mayor's Minute for the Borough of Durban, which are available from 1862 onwards.

(11) See the editorial in the Graham's Town Journal for August 14, 1876. Extracts from this editorial are quoted in Vol. I, pp. 128 to 131 above.

to 1920 it grew at a much slower but very steady pace. Since 1920 the total population of the town has been increasing at a quickening rate. This is due to the influence of the Non-European population of the town, as the European curve follows a slower and increasingly divergent pattern. In other words, the Non-European population of the town has been growing at an increasingly faster rate than the European population of the town. How far this is due to differences in the rates of natural increase, and how far to migration both in and out of the town by the European and Non-European groups it is impossible to say with the data at our disposal. It is not our purpose to pursue the matter, but it may be suggested that at least part of the reason may be the migration of Europeans out of the town to seek employment elsewhere. For the sake of comparison with the figures for the rate of doubling of the European population, we may state that between 1845 and 1900 the total population of Grahamstown about doubled - i.e. it took approximately 55 years to double. This rate of growth persisted until 1920, when it accelerated. At the rate of growth persisting between 1920 and 1951, the total population of the town will double in about forty years - i.e. by about 1960 if the trend continues unaltered.

Thus, while from the point of view of the European population, Grahamstown appears to be a static town, from the point of view of the total population it is possible perhaps that the town is beginning to awake from its period of stagnation. However, it is impossible to pass any judgement in the matter without knowing just what has been the cause for the increasingly divergent rates of growth

for the European and Non-European populations of the town. Has it been due to the migration of Europeans out of the town to other towns, and the low outward flow of Non-Europeans, or is it due to the influx of Non-Europeans, especially Natives, into the town? If this latter process is occuring is it to be taken as a sign that the town is providing an increasing demand for Non-European labour, but not for European labour? If so, is it a temporary phase, and will complete saturation of the Non-European labour market in the town soon occur, resulting in either a trend towards Non-European migration out of the town to find jobs elsewhere, or a lowered standard of living as a limited number of earners have to support a growing Non-European population? How far are differences in the rates of natural increase for the various racial groups a contributing factor? These questions cannot be answered here, but they pose an interesting problem requiring further investigation. In any event, the town is to-day, as far as the European population is concerned, still static, and this is in keeping with the other findings in this study.

Before we leave this topic of the growth of the population of the town, we may finally compare the rate of growth of the population with that of the Cape Province and the Union as a whole for a longer period than has already been covered by our previous comparison. The first figure giving the population of Europeans in the Cape Province is for 1865.(12) In that year the European population of the province stood at 181,592. By 1951

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(12) Vol. I, 1946 Census Report, op. cit., p. 1.

this population had increased to 936,109 Europeans[13] - an increase of 754,517 persons, or 316.38% of the 1865 figure. During the same period we see from Table VII that the European population of Grahamstown increased from 5,263 to 8,680 Europeans, or an increase of 3,417 persons - i.e. 64.92% of the 1865 population. Even if we remember that part of the student population of Grahamstown was away at the time of the 1951 Census, and take the normal term-time population of the town as being about 10,000 Europeans[14] the increase would be only 90% of the 1865 population figure. Taking this latter figure, it still means that the rate of growth of the European population of the town between 1865 and 1951 has been just over a quarter of that for the European population of the Cape during the same period.

The earliest figures giving the size of the Union's population are for 1904. In that year, the European population of South Africa stood at 1,116,806; by 1951 it had reached a figure of 2,642,713[15] giving an increase of 1,525,907 Europeans, or 136.63% of the 1904 figure. During the same approximate period, Grahamstown's European population increased from 7,288 in 1907 to 8,680 in 1951 - an increase of 1,392 persons. If we take the 1951 term-time population of Grahamstown as consisting of about 10,000 Europeans, then the increase would be 2,712 persons. This gives a percentage increase over the 1907 figure of 19.10%, or in the latter case, 37.21%. By either standard it indicates that the rate of growth of Grahamstown's

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(13) Special Report No. 200, op. cit., p. 3.
(14) See p. 392 - 393 below.
(15) Vol. I, 1946 Census Report, op. cit., p.1.

European population has been considerably less than that of the Union's European population, again stressing the fact that Grahamstown has been a relatively static town for the past half century and longer.

Summing up, the various indices of the town's growth that we have constructed point clearly to the fact that the growth of the European population of Grahamstown has been experiencing a relative retardation since about the mid 19th. Century, and that to-day Grahamstown is essentially a static town.

2. Vital Statistics for the European Population:

Table VIII below gives the European birth rate in the town for the five year period 1948 - 1952. The figures were supplied by the Medical Officer of Health for the town:-

TABLE VIII

BIRTH RATES FOR THE EUROPEAN POPULATION IN GRAHAMSTOWN, 1948 - 1952.

YEAR	RATE OF LIVE BIRTHS PER 1,000 (Births to Women Normally Residing in Grahamstown)
1948	17.60
1949	20.24
1950	16.99
1951	15.85
1952	16.71
MEAN FOR PERIOD	17.48

These figures a e for the year ending 30th. June in each case. The figures for the European population in South Africa for the calendar years 1948 - 1952 give a mean figure of 25.5 live births per 1,000. However,

while the Grahamstown figure seems much lower than the South African figure, it must be remembered that the age structure of the two populations is somewhat different,(16) and that the presence of a large school and college population in the town would lower the crude birth rate. Strictly speaking, only standardised birth rates should be compared. As these are not available, fertility rates will afford a better index of the relative level of reproduction by Grahamstown's European population. A fertility rate may be calculated as follows:

$$\frac{\text{No. Children In Population Aged 0-4 Years}}{\text{No. Women In Population Aged 15-44 Years}} \times 1{,}000$$

Calculating this fertility rate for the 1946 census European population (figures for the 1951 census population are not yet available) we find that the rate for the urban European population was 432.25, and the rate for the total European population of the Union was 488.36.(17) The actual figure for the Grahamstown European population is unknown, but an estimate of the figure for the permanent European population of the town (excluding scholars and students) can be obtained from data collected by the sample survey the investigator made in the town.(18) The fertility rate for this sample is 465.11, which probably overestimates slightly the actual fertility rate for the European population. It would therefore seem safe to argue that while the fertility rate for the European population of the town appears lower than the rate for the total European population of the

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(16) See pp. 195-211 below.

(17) From Vol. II, 1946 Census Report (Ages of the Population): U.G. 60-1950: pp. 1 ff.

(18) The rate was calculated from the data given on p. below. Also see Appendix for a description of the sample. The sample fertility rate ... (Continued)

Union, it is comparible with the figure for the urban European population of the country, and apparently does not present any abnormal features.

In Table IX below figures for the European death rate in Grahamstown, as supplied by the town's Medical Officer of Health, are given:

TABLE IX

DEATH RATES FOR THE EUROPEAN POPULATION IN GRAHAMSTOWN, 1948 - 1952.

YEAR	DEATH RATE PER 1,000 (Deaths of Persons Normally Residing in Grahamstown)
1948	7.40
1949	7.60
1950	7.08
1951	12.29
1952	17.82
MEAN FOR PERIOD	10.44

These figures show that the over-all average (mean) death rate among persons normally residing in Grahamstown during the period 1948-1952 was 10.44 deaths per 1,000. It should be pointed out that the rate at the beginning of the period is about 10 deaths per 1,000 less than the figure for the end of the period. The reason for this could not be discovered, but it may be merely chance variation, as in a population of about 10,000 a difference of a few deaths in one or two years will affect the rate quite drastically. It is therefore wiser to take the mean value for the period as a better indication of the position

(18) Continued: ... does not take into account persons living in dwellings other than houses in the town, and so excludes a group likely to have a lower fertility rate. Thus the figure given over-estimates the real position.

in Grahamstown. The figures for the European population in South Africa for the years 1948 - 1952 give a mean death rate of 8.7 deaths per 1,000.(19) As with the crude birth rates, so with the crude death rates, the rates for Grahamstown and the Union are not directly comparible due to the differences in the structures of the two populations. We can attempt some correction by relating the number of deaths among people normally residing in Grahamstown to the estimated size of the population of the town excluding students and scholars whose home towns are elsewhere - i.e. excluding a group whose presence makes the population of the town atypical. On page 393 below it is estimated that the permanent "core" of the European population of the town amounts to about 6,800 persons. Relating the mean number of annual deaths in the town among Europeans normally residing to the town, to this base, we obtain a death rate of 13.3 deaths per 1,000. This means that the crude death rate among the permanent core of Europeans in the town is higher than the death rate of 8.7 deaths per 1,000 in the Union's European population. This is probably due to the presence of relatively more older people in the population of the town than in the Union's European population. This higher death rate would be one of the factors responsible for the slow growth in the town's European population.

According to data collected by the investigator from the death records in the town's Magistrate's Court, the infantile mortility rate for the period 1947 - 1951 was 36.9 infant deaths per 1,000 live births. The South African figure for the same period was 35.6, so that Grahamstown's

(19) See Official Yearbook for the Union of South Africa: Yearbook for 1952-3, p. 1129; Yearbook for 1950, p. 1205. The birth rates and infant mortality rates are also given.

level of infant European health would therefore appear to be about the same as in the Union generally.

As for the death rate for the town, so the crude birth rate for the permanent European "core" of the town, excluding students and scholars from outside the town, has been calculated. For the period 1948 - 1952 the figure was 23.4, and subtracted from the figure of 13.3 for the death rate (given on page 194 above) this gives a crude rate of natural increase of 10.1. Similarly the crude rate of natural increase for the Union's European population during the same period is 16.8. The rate of natural increase in Grahamstown is thus noticeably less than that for the Union's European population - probably due to the older population of Europeans in Grahamstown.(20) This is a factor in the slow rate of growth of the European population of the town, and is an index of the static nature of the town.

3. The Age and Sex Structure of the European Population:

Our information concerning the age and sex structure of the European population of Grahamstown, as well as for the remaining sections on the demographic structure and composition of the population, is derived from data from the sample of 989 houses which were surveyed in the town. The reader is referred to Appendices G and H for a description of the characteristics of this sample.

Table X over the page gives the age-sex distribution of the sample of Europeans in Grahamstown:-

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(20) See pp. 207-211 below.

TABLE X.

THE AGE AND SEX STRUCTURE OF A SAMPLE OF EUROPEANS, GRAHAMSTOWN, 1951-2.

Age in Years	MALES	FEMALES	TOTAL	SEX - RATIO		
				G'town	South Africa	
					URBAN	TOTAL
0 - 4	202	198	400	1.02	1.03	(
5 - 9	192	198	390	0.97	1.02	(1.04
10 - 14	198	202	400	0.98	1.01	(
15 - 19	165	148	313	1.11	0.98	1.03
20 - 24	79	109	188	0.72	0.99	1.01
25 - 29	97	150	247	0.65	1.00	1.00
30 - 34	134	165	299	0.81	0.98	1.00
35 - 39	114	126	240	0.90	0.98	1.00
40 - 44	135	162	297	0.83	1.00	1.01
45 - 49	112	130	242	0.86	0.89	1.02
50 - 54	91	122	213	0.75	0.89	0.95
55 - 59	48	86	134	0.56	0.85	0.94
60 - 64	70	118	188	0.59	0.85	0.90
65 - 69	56	60	116	0.93	0.95	0.91
70 - 74	55	67	122	0.82	0.97	0.97
75 - 79	30	34	64	0.88	0.88	0.95
80 +	19	41	60	0.46	0.76	0.82
UNKNOWN	11	14	25	-	-	-
TOTAL	1,808	2,130	3,938	0.85	0.97	1.00

N.B. Sex-ratios for the European Population of the Union of South Africa are given for comparative purposes. The urban figures are for 1946 - the most recent census for which figures for the urban age distributions are available; the total figures are for 1951, and in terms of time are directly comparible with the Grahamstown figures, whereas the urban figures have a five-year lag involved.(21)

(a) Sex-Ratios of the Population:

Examining the second half of Table X, showing the sex-ratios of the sample population from Grahamstown, and for comparative purposes, the sex-ratios for the urban European population of South Africa in 1946, and the total European population in 1951, it will be seen

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(21) The urban sex-ratios are calculated from data in Vol. I, 1946 Census Report: op. cit., p. 8, Table 4. The total European population's sex-ratios are calculated from Vol. II, 1951 Census Report: Marital Status of the White Population: Government Printer, Pretoria, U.G. 61/1954: p. 2, Table 2.

first and foremost that the sample population of Europeans in Grahamstown has a noteable excess of females over males - 100 females to every 85 males. From what is said on page 394 below, it is likely that the over-all sex-ratio for the stable core of Europeans in the town is even lower than this figure for the population living in houses, so it appears that there can be little doubt that Grahamstown is characterised by a marked excess of females in the European population. This most probably is due to a combination of causes: apart from the presence of two convents in the town, and of a large number of nurses - which is due to the institutional structure of the town - it is evident from Table X that the population drawn from houses is likely to have an excess of females. It is suggested that this low masculinity rate is due to the migration of an excess of males over females out of Grahamstown to seek work elsewhere. Grahamstown is a town which offers only a limited scope of employment to persons of either sex seeking jobs, and the young male seeking a career has to leave the town (if he is at all ambitious) and proceed to one of the bigger centres of urban development; females on the other hand are not under the same pressure as males to make a good career (for in most cases their ultimate career will be house-keeping and parenthood), so that they can stay in the town and work as typists, clerks, and shop assistants. The operative factors are thus differential. While this hypothesis cannot be proved or disproved with the data available, it appears the most likely explanation in view of this and other facts which emerge later in the study.

For brief comparative purposes, it is interesting to note that in 1946 Johannesburg had a sex-ratio of 0.98; Cape Town 0.92; and Port Elizabeth 0.98 for Europeans.(22) In 1951, the European population of Durban had a sex-ratio of 0.95,(23) so that the Grahamstown figure is lower than that for some of the large cities in the Union.(24)

In interpreting the individual sex-ratios for the different age groups, care must be exercised, as a ratio such as a sex-ratio is sensitive to chance variations, and even quite small errors, whether due to sampling chance variations or bias, can produce quite large fluctuations in the sex-ratio. For instance, if the sample was a random sample and not a judgement sample, then 95% confidence limits for the sex-ratios could be calculated.(25) On this basis, the sex-ratio of 1.02 for the 0 - 4 year old age group would have a 95% confidence range of from 0.84 to 1.24, and the limits for the sex-ratio of the 80+ age group would be 0.25 - 0.77:- the wide range here is largely due to the fact there are only 60 persons in this latter age group. However, we cannot know the actual 95% confidence limits of our judgement sample, but it is evident that the sex-ratios in Table X

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(22) Calculated from Vol. I, 1946 Census Report: op. cit., pp. 78ff.

(23) Data kindly supplied by Prof. Kuper, of Natal University, from a study of Durban which is to be published shortly.

(24) The excess of females is often a feature of present-day urban centres, more especially the large ones, as for instance is seen in the United States. c.f. T. Lynn Smith: Population Analysis: McGraw Hill, 1948, Ch. V; P.H. Landis: Population Problems: American Book Co., 1943: p. 257. The latter author contends that this pattern is normally the result of an excess of females

(Continued over page)

can provide only an estimate of the parameters involved, and require cautious interpretation.

The over-all trend of the sex-ratios for each age group is similar to the pattern presented by the Union's European population - both the urban and the total populations. This pattern is for increasing age to be definitely associated with increasing femininity of the population. In the case of the Grahamstown sample, this association appears to be more marked though than in the case of the Union's European population, and is one facet of the excess of females in the town.

Several distinctive features are also evinced by the sample sex-ratios. In particular, the ratios for the 20-29 age range are markedly less than the ratio of approximately unity which one would expect on the basis of the Union's pattern. There is no reason to suppose that the low sex-ratios of 0.72 and 0.65 are due to biases in the sample, so that it is likely that these figures reflect actual parameter values. For an age group as young as that of the 20-29 years old group, the ratios

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(24) Continued from previous page: .... over males migrating from rural areas to the towns. This process is then the opposite of what it is suggested is occurring in Grahamstown - and perhaps other small towns too.

(25) The 95% confidence limits for sex-ratios from a random sample may be calculated as follows:-

$$S.R. = \frac{M \pm (\sqrt{N_s pq} \times 1.96)}{F \mp (\sqrt{N_s pq} \times 1.96)}$$

Where S.R. = upper and lower 95% confidence limits of the sex-ratio.
M = No. of males in particular age group
F = No. of females in particular age group
N_s = Total No. of persons (M+F) in particular age group
p = Proportion of males in particular age group.
q = 1.00 - p.

are strikingly low, and this suggest that if we are correct in believing that there is an excess of males over females migrating out of the town, then it is especially the young working group that is affected selectively. This could well be, as it is especially the young working group still seeking careers that is affected by the lack of prospects in most of the occupations in Grahamstown. It must be emphasised however that all this is surmise, and that while it seems a likely surmise in view of the picture of Grahamstown given in this study, the truth of it can neither be proved nor disproved until a special study beyond the scope of this one is made.

Most of the other sex-ratios do not differ sufficiently widely from the norm provided by the Union's population to warrant any importance being attached to them, except for the ratios for 55-64 year old age groups. The ratios of 0.56 and 0.59 are much lower than one would expect. It is difficult to account for this feature here, but Table XIII, page 212 shows that it is due to an excess of spinsters and widows in these two age groups.

(b) Population Type to which Grahamstown's European Population Approximates:

At the beginning of the present century, a demographer by the name of Sundbärg developed the concept that populations can be divided into three types - viz. the progressive population, the stationary population, and the regressive population.(26) He established the following modal proportions of the various age groups in his three types of

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(26) A.G. Sundbärg: Sur la répartition de la population par âge et sur les taux de mortalite: Bulletin de l' Internationale de Statistique: (Norway) Tome XX 1re livraisou 1900, pp. 89 - 94.

populations: the progressive population, with a high proportion of children, and a high rate of growth, has 40% of the population under 15 years, 50% between 15 — 49 years, and 10% over 50 years of age; the stationary population with a moderate percentage of children and old persons, and a slow or stationary rate of growth, has 26.5% under the age of 15 years, 50.5% between 15 and 49 years, and 23% over the age of 50 years; finally the regressive population has a high percentage of old persons, and declining numbers, and has only 20% of the population under 15 years, 50% between 15 - 49 years, and 30% over the age of 50 years. Comparing Grahamstown's European sample population with these modal figures, we find that it has 30.5% under the age of 15 years, 46.4% between the ages of 15 and 49 years, and 23.1% aged 50+ years. Thus, while the town has slightly more children than Sundbärg's stationary population (4.0% more) it undoubtedly approximates to his stationary population type, and cannot be indentified with any of the other two population types. By this standard the present-day European population of Grahamstown is a stationary one, and when we bear in mind that the sample probably underestimates the proportion of older persons in the total European stable core in the town (i.e. excluding students from elsewhere, and hospitalised persons)[27] then it appears likely that the actual parameter values of the population would approximate even more closely to Sundbärg's stationary type. This then is yet another index of the static nature of Grahamstown to-day.

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(27) See pp. 394 below.

(c) Age Structure of the European Population:

The figures in Table X, page 196 above, are given in Table XI below as a percentage of the total sample of 3,938 persons. The percentage distribution of the 1946 urban European population of South Africa - the most recent data for an urban population in the Union available - is also given for comparative purposes:

TABLE XI

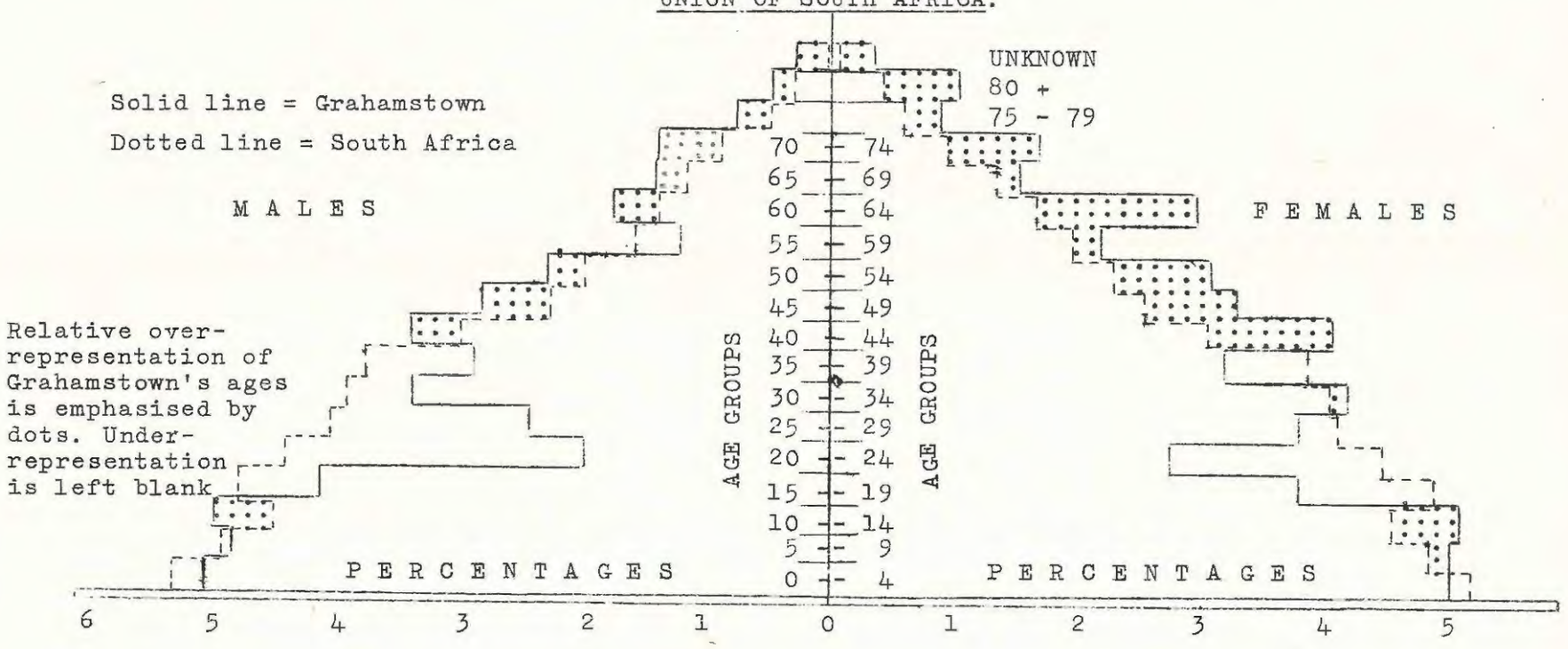
PERCENTAGE DISTRIBUTION, BY AGE AND SEX, OF A SAMPLE OF EUROPEANS DRAWN FROM HOUSES IN GRAHAMSTOWN, 1951-2, COMPARED WITH THE PERCENTAGE DISTRIBUTION OF THE 1946 URBAN EUROPEAN POPULATION OF THE UNION OF SOUTH AFRICA.

Age in Years	% GRAHAMSTOWN			% SOUTH AFRICA (URBAN)		
	Males	Females	Total	Males	Females	Total
0 - 4	5.13	5.03	10.16	5.35	5.20	10.55
5 - 9	4.88	5.03	9.91	4.94	4.84	9.78
10 - 14	5.03	5.13	10.16	4.56	4.53	9.09
15 - 19	4.19	3.77	7.96	4.81	4.89	9.70
20 - 24	2.01	2.77	4.78	4.44	4.47	8.91
25 - 29	2.46	3.81	6.27	4.08	4.10	8.18
30 - 34	3.40	4.19	7.59	3.95	4.03	7.98
35 - 39	2.89	3.20	6.09	3.78	3.86	7.64
40 - 44	3.43	4.11	7.54	3.03	3.05	6.08
45 - 49	2.84	3.30	6.14	2.29	2.56	4.85
50 - 54	2.31	3.10	5.41	2.03	2.28	4.31
55 - 59	1.22	2.18	3.40	1.66	1.95	3.61
60 - 64	1.78	2.99	4.77	1.41	1.65	3.06
65 - 69	1.42	1.52	2.94	1.27	1.33	2.60
70 - 74	1.40	1.70	3.10	0.90	0.93	1.83
75- 79	0.76	0.86	1.62	0.50	0.57	1.07
80 +	0.48	1.04	1.52	0.31	0.41	0.72
UNKNOWN	0.28	0.36	0.64	0.02	0.02	0.04
TOTAL	45.91	54.09	100.00	49.33	50.67	100.00

The data for the 1946 urban European population of South Africa are from Vol. I, 1946 Census Report, op. cit., Table 4, p. 8. Urban areas are taken by the census to be "all towns irrespective of size which have some form of local government." Para. 3, p. iv, ibid.

F I G U R E I V.

AGE-SEX PYRAMID FOR THE SAMPLE OF EUROPEANS LIVING IN HOUSES IN GRAHAMSTOWN, 1951-2, COMPARED WITH THE 1946 URBAN EUROPEAN POPULATION OF THE UNION OF SOUTH AFRICA.



The contents of Table XI are presented in graphic form in the age-sex pyramid, Figure IV, page 203 above. The most striking feature of the figure is the relative absence on the male side of young Europeans aged 15 to 39 years in the Grahamstown sample. The same is true for the female side of the pyramid, though to a lesser extent. As there are no grounds whatsoever for assuming that this marked absence of the young working group in the sample's age composition is due to biases in the sample, and in view of the fact that in Appendix H it is contended that the European population in Grahamstown living outside houses is predominantly middle-aged in character, it appears that the graph is likely to represent the actual position in the town. It has already been suggested that there may be a migration of Europeans (especially males) out of the town to seek employment in the bigger towns with their better prospects. Being a town where the young and mature working group in the European population appears to be under-represented, Grahamstown appears to be a town with restricted economic activity - which is just another way of saying that the town is a static one. This further reinforces our previous conclusions on the subject.

The second major pattern revealed by Figure IV is that with one minor exception, the 40+ age groups on both sides of the pyramid are relatively over-represented in the Grahamstown sample. As in Appendix H it is suggested that the population of Europeans in Grahamstown not living in houses has a predominance of older persons, it seems possible that the actual over-representation of persons aged 40+ years in the European population of the town is even greater than Figure IV suggests. Apart from the

suggested migration of persons of young working age out of the town, the over-representation of middle-aged and older persons in the town is likely also to be due to the importance of professional occupations in the town, and that the town, according to popular belief, attracts retired persons and pensioners. On the former point, Grahamstown as an educational town provides occupations for a fair number of professors, lecturers, teachers, and the like who are employed in the educational institutions in the town. Likewise, as the seat of the Supreme Court for the Eastern Province, it attracts lawyers and advocates, and members of the judiciary. These professional groups are composed mainly of people in the middle age of their lives, who have migrated to the town from outside it. On the latter point about retired persons, one writer has written that to-day Grahamstown is "generally associated with the resting place of Rip van Winkle,"(28) and it is held that persons who have past their days of being gainfully occupied migrate to the town to spend their last few years in the peace of a small town. It is therefore put forward that the peculiar age distribution of Grahamstown's European population is likely to be due to selective migration - migration out of the town of persons, especially males, in the young working age groups, and migration into the town of older professional workers and retired persons. While this hypothesis may not mention all the factors at work producing the atypical age-sex structure of the town, it seems likely that it includes most of the factors involved. The question of the greater degree of relative

(28) Thomson: A Short History of Grahamstown: op. cit., foreword.

over-representation of females in comparison with males in the 40+ age groups will be dealt with in section 4.) below where the marital status of the population is discussed.

We may sum up our comparison of the sample European population's age-sex structure with that of the 1946 urban European population of South Africa by presenting the percentages of each population in the 0 - 14 years (pre-working); 15 - 39 years (young working); 40 - 59 years (middle-aged and older working); and 60+ years (retired) age groups. This is done in Table XII below:-

TABLE XII.

A COMPARISON OF THE GRAHAMSTOWN SAMPLE AND THE URBAN 1946 EUROPEAN UNION POPULATION, BY MAJOR AGE-SEX GROUPINGS.

Age in Years	% GRAHAMSTOWN			% SOUTH AFRICA (URBAN)		
	Males	Females	Total	Males	Females	Total
0 - 14	15.04	15.19	30.23	14.85	14.57	29.42
15 - 39	14.95	17.74	32.69	21.06	21.35	42.41
40 - 59	9.80	12.69	22.49	9.01	9.84	18.85
60 +	5.84	8.11	13.95	4.39	4.89	9.28
UNKNOWN	0.28	0.36	0.64	0.02	0.02	0.04
TOTAL	45.91	54.09	100.00	49.33	50.67	100.00

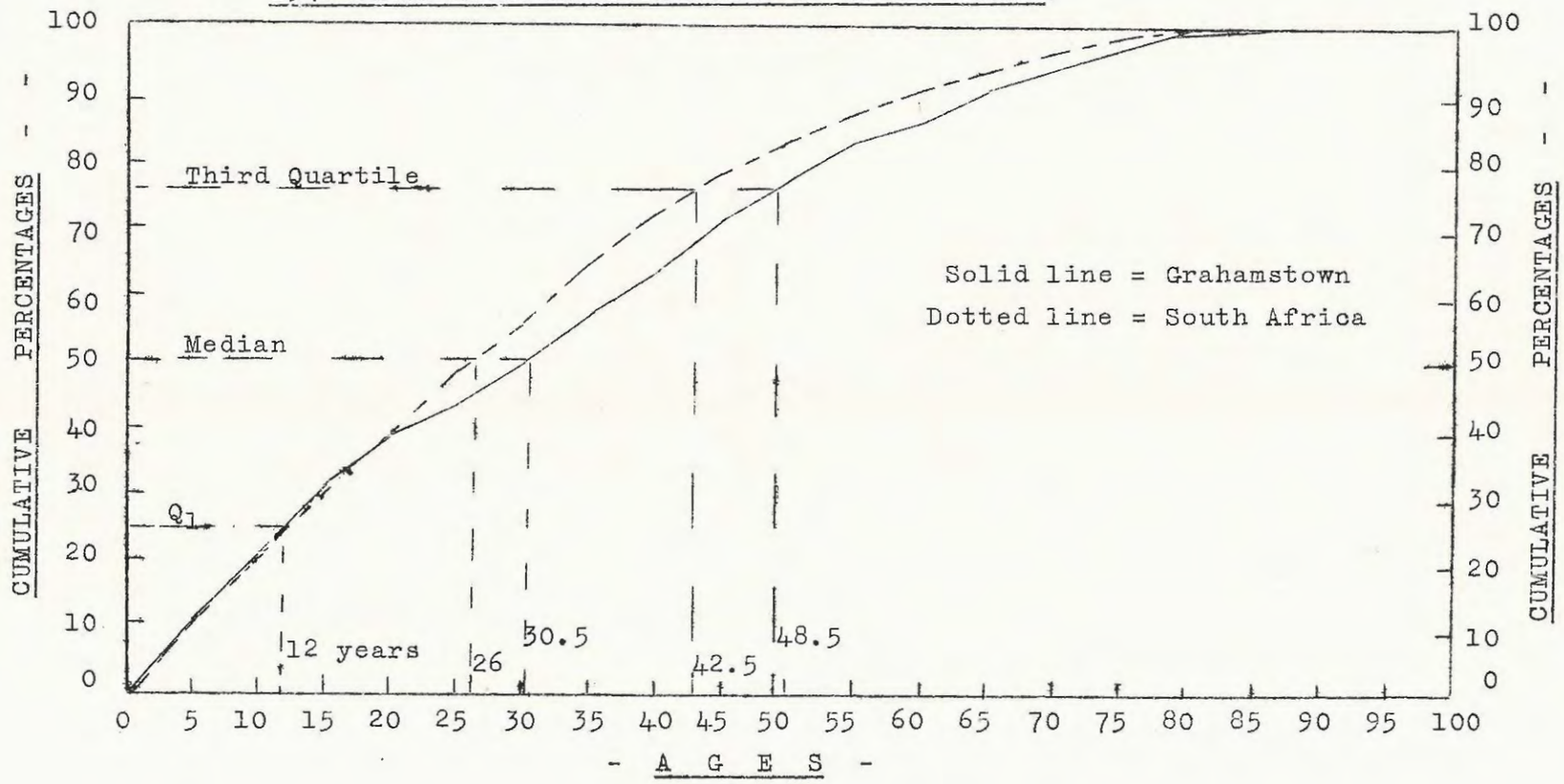
In viewing this table, it should be remembered that the over-representation of the 40 - 59 age group amongst the sample of males is somewhat reduced by the under-representation in the 55 - 59 years old age group - see Figure IV. (The 40 - 54 years old age group of males sampled from Grahamstown is over-represented: 8.58% of the Grahamstown sample as against 7.35% of the Union's 1946 European urban population are males between the ages of 40 and 54 years.)

With the last paragraph in mind, it is obvious from Table XII that only the 0 - 14 years old age group approximates fairly closely to the norm provided by the Union's urban European population. This age group is the pre-working age group, and is the one which is still affected more by biological and social biological forces than by sociological forces. The general pattern is for the older age groups, which are subject to all kinds of selective pressures and processes, to depart noticeably from the Union's norm. Figure IV shows that while the configuration of the Union's urban population is fairly normal in that it does not depart radically from the pattern one would expect on a purely biological basis, the pattern for Grahamstown departs radically from the theoretically expected shape. As has been suggested above, selective migration is probably the major cause for this fact, and only the youngest age groups are not disturbed by it.

The total percentages in the fourth and seventh columns of Table XI have been cumulated, and are graphed in Figure V over the page. The distribution of the younger age groups in the Grahamstown sample and the Union's urban European population follow the same trend, but from the age of 20 years onwards the two trends diverge. The effect of this is for the Grahamstown population to be an older population. Reading from the graph, the first quartile for both distributions is 12 years old; the median age for the Union's urban population is 26 years as against $30\frac{1}{2}$ years for Grahamstown; and the third quartiles are $42\frac{1}{2}$ years and $48\frac{1}{2}$ years respectively. The Grahamstown population is therefore a markedly older population, especially

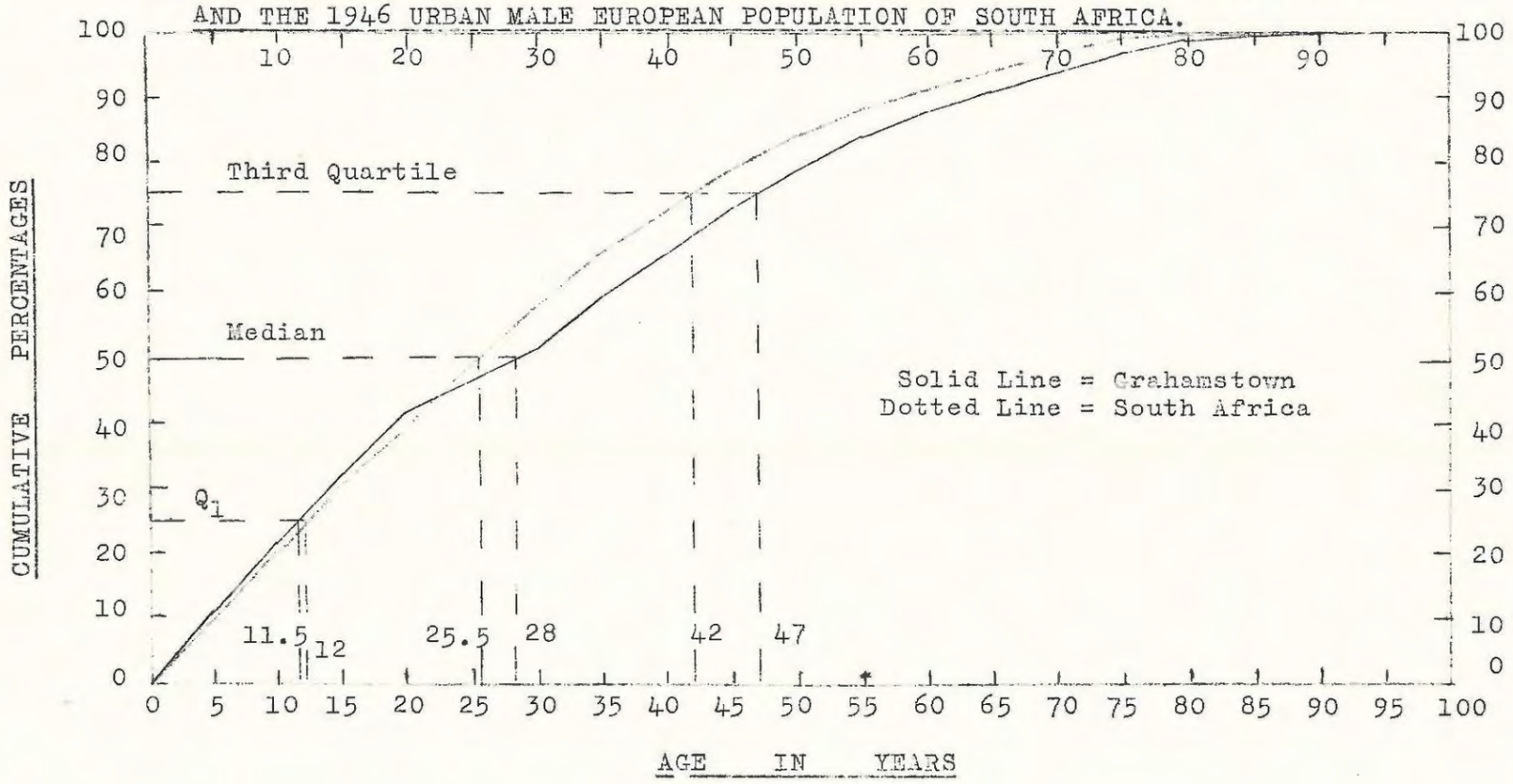
F I G U R E V.

OGIVES OF THE AGE DISTRIBUTION OF THE GRAHAMSTOWN SAMPLE, 1951-2, AND THE 1946 URBAN EUROPEAN POPULATION OF SOUTH AFRICA.



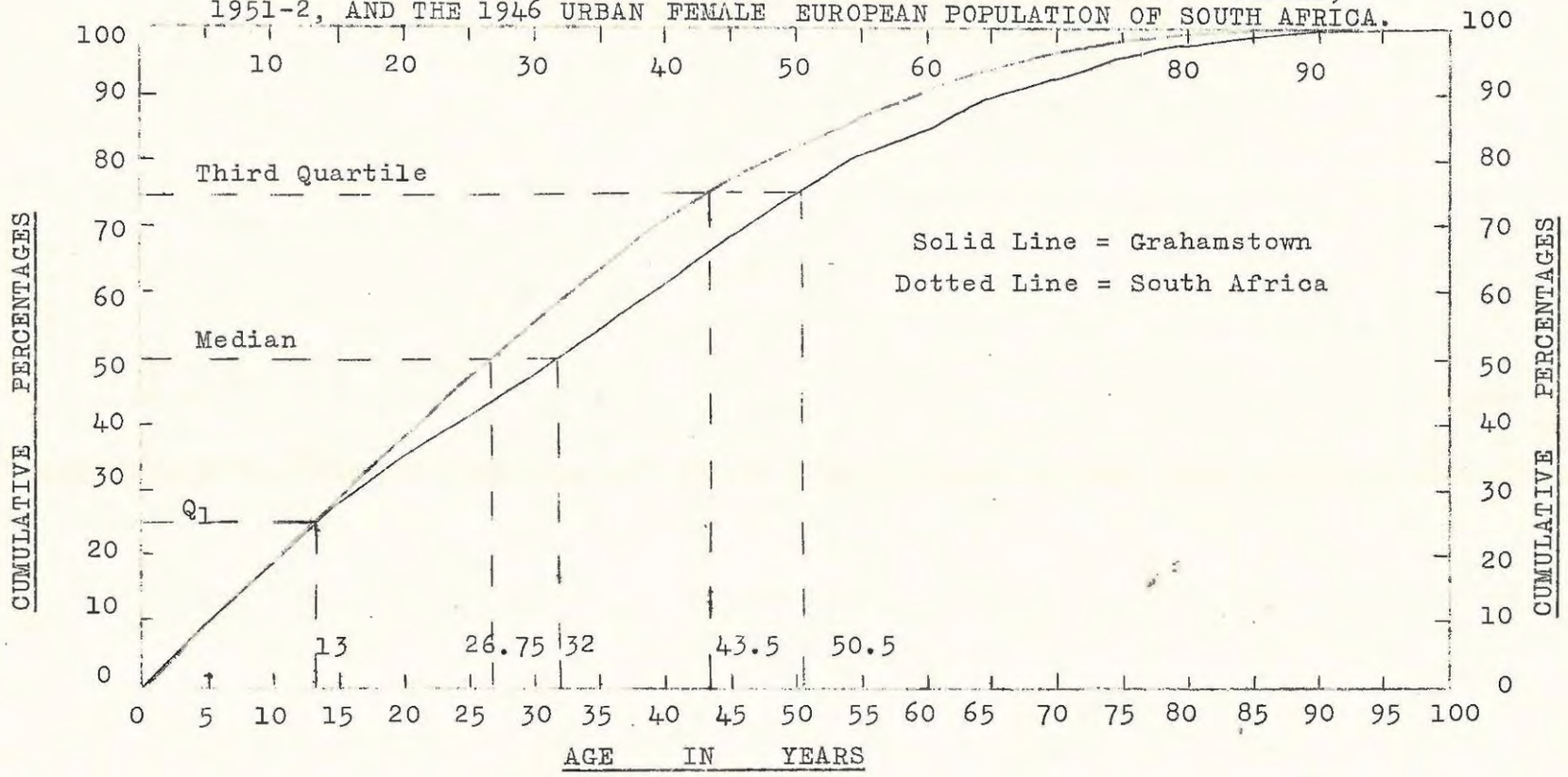
F I G U R E VI.

OGIVES OF THE AGE DISTRIBUTION OF THE GRAHAMSTOWN SAMPLE OF MALES, 1951-2, AND THE 1946 URBAN MALE EUROPEAN POPULATION OF SOUTH AFRICA.



F I G U R E VII.

OGIVES OF THE AGE DISTRIBUTION OF FEMALES IN THE GRAHAMSTOWN SAMPLE, 1951-2, AND THE 1946 URBAN FEMALE EUROPEAN POPULATION OF SOUTH AFRICA.



when we remember that the sample from Grahamstown is likely to under-estimate the parameter average age.

Figures VI, page 209, and VII, page 210, similarly present ogives of the distributions of the male and female ages for Grahamstown and the Union's urban population. (The percentages for each sex as a total of that sex in the Grahamstown sample were calculated from Table X, page 196; the Union's figures were derived from Volume I of the 1946 Census report. (op. cit.) It was not deemed necessary to present these percentages in tabular form as well.) Both figures present similar patterns - the Grahamstown population is an older population, and only follows the Union's norm for the youngest age groups. The quartile age for males in the Grahamstown sample is $11\frac{1}{2}$ years as against 12 years for the Union's urban European population; the median age is 28 years as against $25\frac{1}{2}$ years; the 3rd. quartile age is 47 years as against 42 years, respectively. Similarly, the 1st. quartile age for females in the Grahamstown sample is 13 years, which as the same as the quartile age for the Union's urban European population; the median age is 32 years as against 27 years; and the 3rd. quartile age is $50\frac{1}{2}$ years as against $43\frac{1}{2}$ years respectively. Thus, not only are the male and female Grahamstown sample populations older than their counterparts in the urban areas of South Africa, but the female population from Grahamstown is noticeably older than the male population - far more so than is the case in the Union as a whole, where the differences between the average ages of the male and female urban European population are slight. In this respect too the Grahamstown population is peculiar.

4. Marital Status of the Sample Population:

The marital status of the Grahamstown European sample population, by age and sex, is given in Table XIII below:

TABLE XIII.

MARITAL STATUS OF THE GRAHAMSTOWN EUROPEAN SAMPLE POPULATION.

Age in Years	NEVER MARRIED		MARRIED		WIDOWED		
	Male	Female	Male	Female	Male	Female	TOTAL
0 - 4	202	198	-	-	-	-	
5 - 9	192	198	-	-	-	-	
10 - 14	198	202	-	-	-	-	
15 - 19	165	144	-	4	-	-	
20 - 24	64	59	15	49	-	-	
25 - 29	22	21	75	126	-	1	
30 - 34	14	23	118	128	1	9	
35 - 39	7	14	105	103	1	3	
40 - 44	12	26	122	120	-	10	
45 - 49	11	18	100	95	-	16	
50 - 54	5	22	83	77	-	20	
55 - 59	3	17	43	48	1	18	
60 - 64	1	20	66	54	3	42	
65 - 69	4	9	43	21	7	30	
70 - 74	1	14	40	24	13	27	
75 - 79	1	3	23	7	6	24	
80 +	1	7	9	2	9	32	
UNKNOWN	3	7	7	5	1	2	
TOTAL	906	1,002	849	863	42	234	

Ages	DIVORCED		NOT GIVEN		TOTAL		
0 - 4	-	-	-	-	202	198	400
5 - 9	-	-	-	-	192	198	390
10 - 14	-	-	-	-	198	202	400
15 - 19	-	-	-	-	165	148	313
20 - 24	-	1	-	-	79	109	188
25 - 29	-	2		-	97	150	247
30 - 34	1	5	-	-	134	165	299
35 - 39	1	6	-	-	114	126	240
40 - 44	1	4	-	2	135	162	297
45 - 49	1	1	-	-	112	130	242
50 - 54	2	3	1	-	91	122	213
55 - 59	1	1	-	2	48	86	134
60 - 64	-	1	-	1	70	118	188
65 - 69	2	-	-	-	56	60	116
70 - 74	1	2	-	-	55	67	122
75 - 79	-	-	-	-	30	34	64
80 +	-	-	-	-	19	41	60
UNKNOWN	-	-	-	-	11	14	25
TOTAL	10	26	1	5	1,808	2,130	3,938

(a) Marital Status for All Ages Combined:

From Table XIII the percentage distribution of the marital status of the sample, irrespective of age, has been calculated. Table XIV below compares these percentages with the data for the 1951 urban European population of South Africa:-(29)

TABLE XIV.

PERCENTAGE DISTRIBUTION OF THE MARITAL STATUS OF THE EUROPEANS SAMPLED FROM GRAHAMSTOWN, 1951-2, COMPARED WITH THAT OF THE URBAN EUROPEAN POPULATION OF SOUTH AFRICA, 1951.

MARITAL STATUS	M A L E S		F E M A L E S		T O T A L	
	G'town	S.A.	G'town	S.A.	G'town	S.A.
Never Married	50.1	53.3	47.1	47.4	48.5	50.3
Married	46.9	43.8	40.5	43.1	43.5	43.5
Widowed	2.5	1.8	11.0	8.0	7.0	4.9
Divorced	0.5	1.1	1.2	1.5	0.9	1.3
Unspecified	0.0*	0.0*	0.2	0.0*	0.1	0.0*
T O T A L	100.0	100.0	100.0	100.0	100.0	100.0

* The percentages involved were too small to show to only one decimal place.

In interpreting this table, it is wisest not to pay attention to only small differences between the Union's and the Grahamstown sample's figures, as we are not sure how far the sample figures are subject to error.

Of the Never Married (single) persons in the sample of Europeans in houses in the town, it is the males who are relatively under-represented, whereas the females are present in the same proportion as in the Union. Married men in the sample are relatively somewhat over-

represented, whereas married women are relatively somewhat under-represented. Widowed persons in the sample - both male and female - are relatively over-represented, while the divorced group in the sample tends, it would seem, to be slightly under-represented. The significance of these patterns will be discussed when the age structure of the various marital status groups is discussed below.

The sex-ratios for the various marital status groups have been calculated from Table XIII. These are given below in Table XV, where the sex-ratios for the urban European population in 1951 are also given.(30)

TABLE XV.

SEX-RATIOS FOR THE VARIOUS MARITAL STATUS GROUPS, GRAHAMSTOWN SAMPLE AND EUROPEAN URBAN 1951 POPULATION.

MARITAL STATUS	Grahamstown	South Africa
Never Married	0.90	1.10
Married	0.98	0.99
Widowed	0.18	0.22
Divorced	0.38	0.68

Examining this table, it is again wisest to only take notice of the larger differences between the sample data and the Union's data. It appears that the sex-ratio for Never Married males in the town is lower than that which would be expected on the basis of the 1951 urban

(29) From previous page: The marital status of the urban European population of the Union in 1951 was obtained from Vol. II, 1951 Census Report: Marital Status of the White Population: Government Printer, Pretoria, U.G. 61/1954: Table I, p. 1. The figures were percentaged in order to be comparable with Grahamstown.

(30) Calculated from 1951 census data: ibid.

European population of the Union. It is possible that this low sex-ratio may be due to sampling bias, but there is no reason for assuming this, so that the figure is taken to represent an actual pattern in the town. It would appear then that part of the reason for the excess of females in the Grahamstown European population is an excess of unmarried females. This would fit in with the theory of a migration of young working males out of the town, for if this actually occurred, it would probably affect the unmarried males more than unmarried females, in view of the differing opportunites afforded by the town for the two sexes, and the differing career needs of the two sexes.

The sex-ratios for the sample of married, and widowed persons, do not differ greatly from those for the urban European population of the Union in 1951. However, there is a noteable difference between the Grahamstown sample's sex-ratio for divorced persons, and that for the Union. It must be borne in mind that there were only a total of 26 divorced persons in the sample, so that no great reliance can be placed on the sex-ratio of a sample which is both relatively and mathematically small. If the sex-ratio does reflect the actual parameter value, then it may mean that Grahamstown is not only a town which attracts retired persons, but one which also attracts divorced women. This would be another - though minor - facet of the excess of females in the town. Grahamstown could be, in fact, a place to which one withdraws from more complex areas, either to rest after one's life work, or to recover from a social trauma....

(b) Age Structure of the Various Marital Status Groups:

Table XIII on page 212 above gave the raw data for the age-sex distribution of the various marital status groups. In Table XVI below the figures for the Never Married, Married, and Widowed groups are percentaged. (The figures for the Divorced group have not been percentaged, as only a total of 26 cases occurred - too small a number to be worth percentaging.):-

TABLE XVI.

PERCENTAGE DISTRIBUTION OF THE NEVER MARRIED, MARRIED, AND WIDOWED GROUPS IN THE GRAHAMSTOWN SAMPLE, 1951-2.

Age in Years	NEVER MARRIED			MARRIED		
	Male	Female	Total	Male	Female	Total
0 - 4	10.59	10.38	20.97	-	-	-
5 - 9	10.06	10.38	20.44	-	-	-
10 - 14	10.38	10.59	20.97	-	-	-
15 - 19	8.65	7.55	16.20	-	0.23	0.23
20 - 24	3.35	3.09	6.44	0.88	2.86	3.74
25 - 29	1.15	1.10	2.25	4.38	7.36	11.74
30 - 34	0.73	1.21	1.94	6.88	7.48	14.36
35 - 39	0.37	0.73	1.10	6.13	6.02	12.15
40 - 44	0.63	1.36	1.99	7.13	7.01	14.14
45 - 49	0.58	0.94	1.52	5.84	5.55	11.39
50 - 54	0.26	1.15	1.41	4.85	4.50	9.35
55 - 59	0.16	0.89	1.05	2.51	2.80	5.31
60 - 64	0.05	1.05	1.10	3.86	3.15	7.01
65 - 69	0.21	0.47	0.68	2.51	1.23	3.74
70 - 74	0.05	0.73	0.78	2.34	1.40	3.74
75 - 79	0.05	0.16	0.21	1.34	0.41	1.75
80 +	0.05	0.37	0.42	0.53	0.12	0.65
UNKNOWN	0.16	0.37	0.53	0.41	0.29	0.70
TOTAL	47.48	52.52	100.00	49.59	50.41	100.00

TABLE CONTINUED OVER THE PAGE.

TABLE XVI.

(CONTINUED)

Age in Years	WIDOWED		
	Males	Females	Total
0 - 4	-	-	-
5 - 9	-	-	-
10 - 14	-	-	-
15 - 19	-	-	-
20 - 24	-	-	-
25 - 29	-	0.36	0.36
30 - 34	0.36	3.26	3.62
35 - 39	0.36	1.09	1.45
40 - 44	-	3.62	3.62
45 - 49	-	5.80	5.80
50 - 54	-	7.24	7.24
55 - 59	0.36	6.52	6.88
60 - 64	1.09	15.23	16.32
65 - 69	2.54	10.87	13.41
70 - 74	4.72	9.78	14.50
75 - 79	2.17	8.70	10.87
80 +	3.26	11.59	14.85
UNKNOWN	0.36	0.72	1.08
TOTAL	15.22	84.78	100.00

TABLE XVII.

PERCENTAGE DISTRIBUTION OF THE NEVER MARRIED, MARRIED, AND WIDOWED GROUPS IN THE EUROPEAN POPULATION OF SOUTH AFRICA, 1951.

Age in Years	NEVER MARRIED			MARRIED		
	Male	Female	Total	Male	Female	Total
0 - 14	32.54	31.41	63.95	-	-	-
15 - 19	8.24	7.29	15.53	0.04	0.81	0.85
20 - 24	6.18	3.23	9.41	1.95	5.09	7.04
25 - 29	2.45	1.05	3.50	5.56	7.07	12.63
30 - 34	1.08	0.62	1.70	6.88	7.21	14.09
35 - 39	0.70	0.57	1.27	7.19	7.12	14.31
40 - 44	0.53	0.59	1.12	6.98	6.47	13.45
45 - 49	0.37	0.51	0.88	5.55	4.85	10.40
50 - 54	0.27	0.40	0.67	4.13	3.61	7.74
55 - 59	0.23	0.32	0.55	3.69	2.97	6.66
60 - 64	0.19	0.27	0.46	2.91	2.16	5.07
65 - 69	0.15	0.21	0.36	2.19	1.37	3.56
70 - 74	0.13	0.15	0.28	1.57	0.78	2.35
75 - 79	0.08	0.09	0.17	0.87	0.35	1.22
80 +	0.05	0.08	0.13	0.47	0.14	0.61
UNKNOWN	0.01	0.01	0.02	0.01	0.01	0.02
TOTAL	53.20	46.80	100.00	49.99	50.01	100.00

TABLE XVII.

(CONTINUED.)

Age in Years	WIDOWED		
	Males	Females	Total
0 - 14	-	-	-
15 - 19	0.01	0.01	0.02
20 - 24	0.04	0.18	0.22
25 - 29	0.15	0.50	0.65
30 - 34	0.29	1.06	1.35
35 - 39	0.47	1.92	2.39
40 - 44	0.68	3.39	4.07
45 - 49	0.92	4.79	5.71
50 - 54	1.12	6.97	8.09
55 - 59	1.57	9.59	11.16
60 - 64	1.97	11.72	13.69
65 - 69	2.65	12.24	14.89
70 - 74	3.22	11.36	14.58
75 - 79	3.03	8.54	11.57
80 +	3.42	8.14	11.56
UNKNOWN	0.01	0.04	0.05
TOTAL	19.55	80.45	100.00

For comparative purposes, the percentage distributions of the Never Married, Married, and Widowed persons in the Union of South Africa at the time of the 1951 Census, are given in Table XVII, on this and the previous page. (The data in Table XVII are for the total European population in the Union, as the age-sex figures published do not treat urban areas separately.)(31)

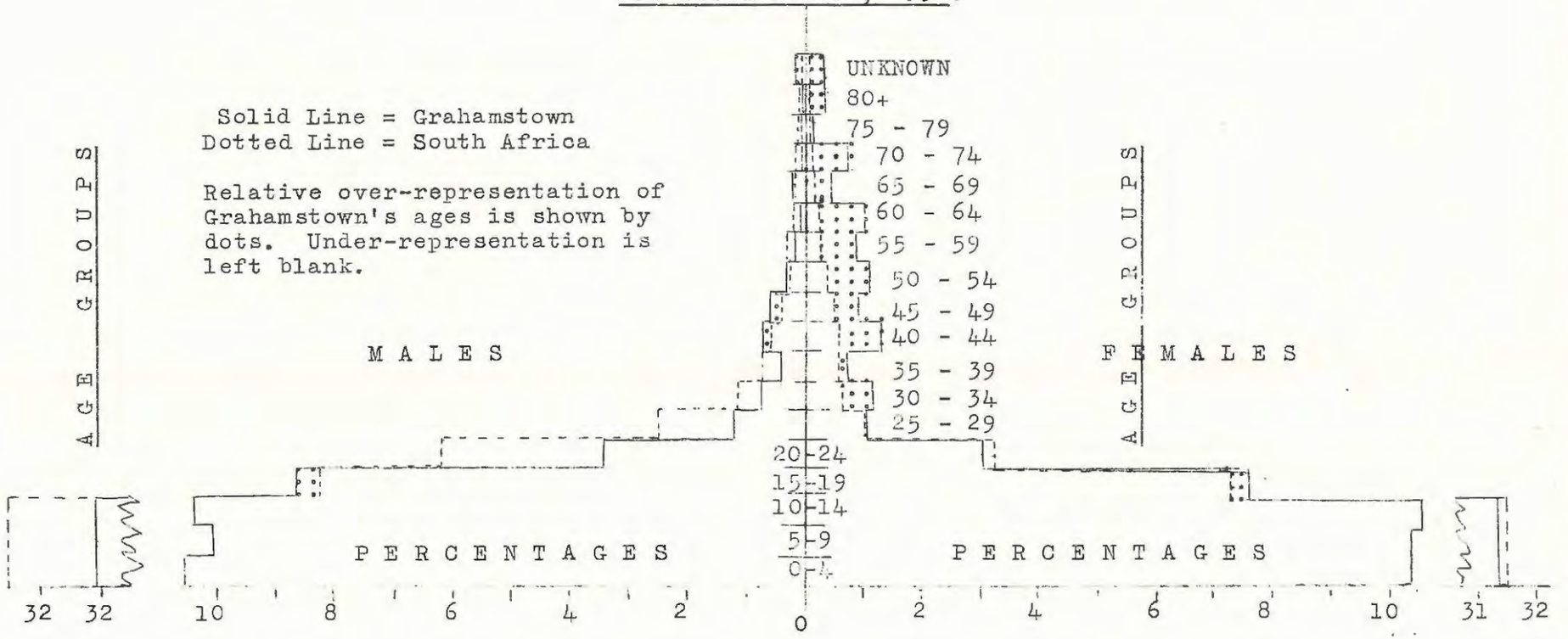
The data for the Never Married group in the Grahamstown sample have been graphed in the form of an age-sex pyramid in Figure VIII over the page. The age-sex pyramid for the Never Married group in the 1951 European population of the Union is also shown for comparative purposes.

The most striking feature presented by Figure VIII is the marked over-representation of unmarried females

(31) See Vol. II, 1951 Census Report: op. cit., Table 2, p. 2.

F I G U R E VIII.

AGE-SEX PYRAMID OF NEVER MARRIED EUROPEANS, GRAHAMSTOWN SAMPLE, 1951-2, AND SOUTH AFRICA, 1951.



in the older age groups, especially from about 40 years of age onwards. How far this marked excess of middle-aged and older spinsters in the sample is due to a migration into the town of women in this class - perhaps the town is an attractive one for them to come and settle in - and how far it is due in past years to eligible young men in the 20+ years old age group leaving the town to seek work elsewhere, so that the women failed to find mates for marriage, it is not possible to say on the basis of this study. It is considered that the pattern shown is likely to reflect the actual position in the town, and is not, as far as can be ascertained, due to sampling bias. This being so, one might add that the town should not only have the reputation of being a town to which old people come to retire, but it should also rightfully have the reputation of being a town where middle-aged and old maids dwell. This again would seem to be an index of the static nature of the town's existence.

On the male side of the age-sex pyramid in Figure VIIIthe major tendency is for the sample of males to be under-represented relative to the Union's distribution, particularly in the under 40 years old age groups. The reason for this has already been suggested - there is probably a migration out of the town of young males seeking employment in the larger urban centres of the country.

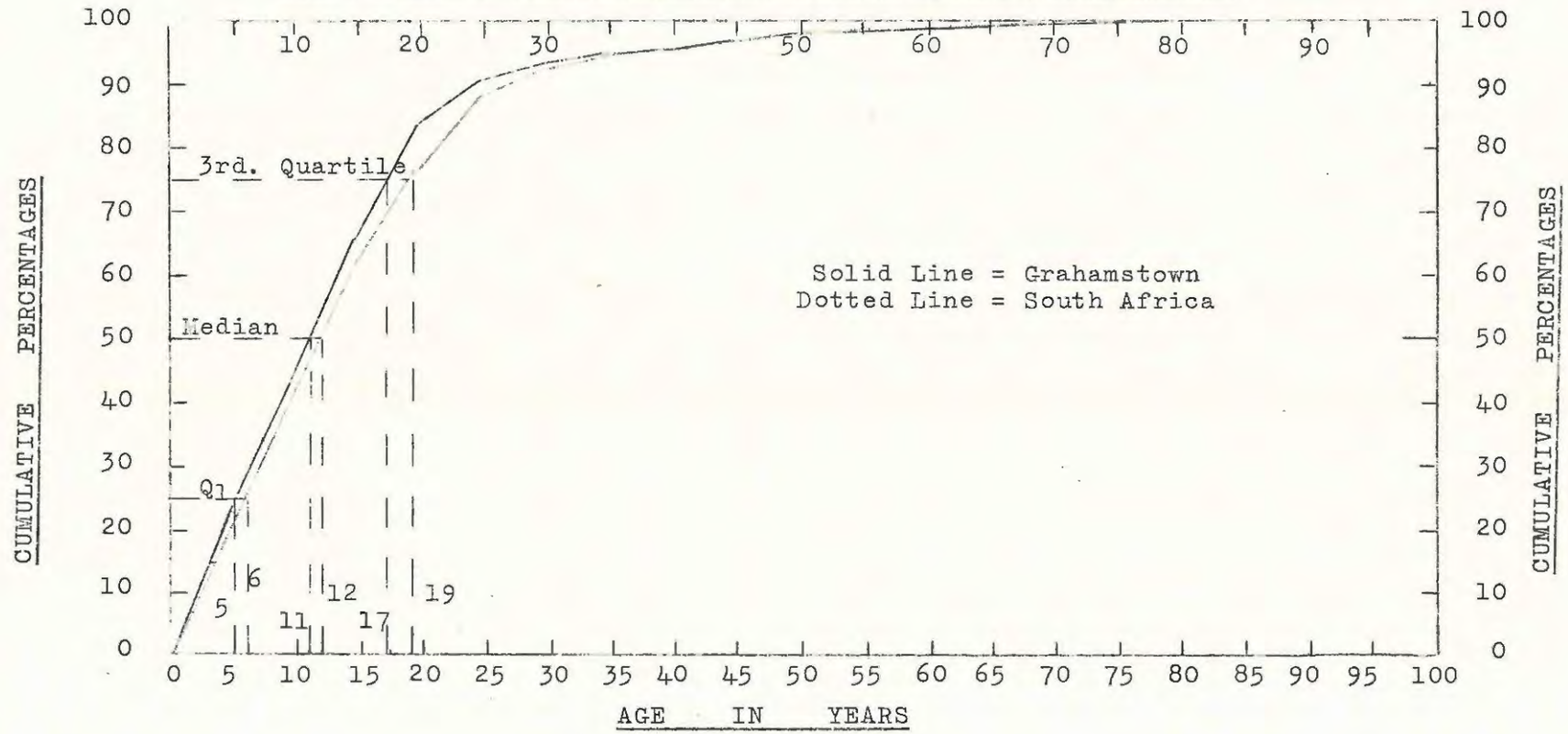
The excess of females in the Never Married group, shown in Table XV, page 214, would thus seem to be due to a relative and absolute concentration of middle-aged and older spinsters, and a reduced number of young males.

The age-sex distribution of this population of Never Married Europeans living in houses in Grahamstown is definitely abnormal in the sense that it departs from the Union's norm. In view of the nature of the population of Europeans in Grahamstown living in dwellings other than houses, it is considered that the pattern for the whole population of Europeans in the town is substantially similar, and is also characterised by an excess of middle-aged and older spinsters and a shortage of young unmarried males. Such a disturbed pattern is essentially the result of powerful selective forces operating on the town, and it is suggested that these forces are the result of the inherently static nature of the structure and life of Grahamstown.

Figures I X and X, pages 222 and 223 present ogives of the male and female age distributions of the Never Married group sampled from Grahamstown: the respective distribution for the Union's Never Married population is also shown. The distribution of Never Married males in the sample on the whole tends to follow the Union's pattern fairly closely, with the main difference being the under-representation of the 15 - 29 age group in the sample. Reading from the graph, the first quartile age for the sample of males is 5 years; the median age 11 years, and the third quartile age 17 years. The corresponding values for the Union's Never Married male distribution are 6 years, 12 years, and 19 years, revealing that the differences between the two distributions are not marked - the main result of the under-representation of the young working group of males in the sample is to give greater weight to the 0 - 14 years old pre-working group, and make the sample

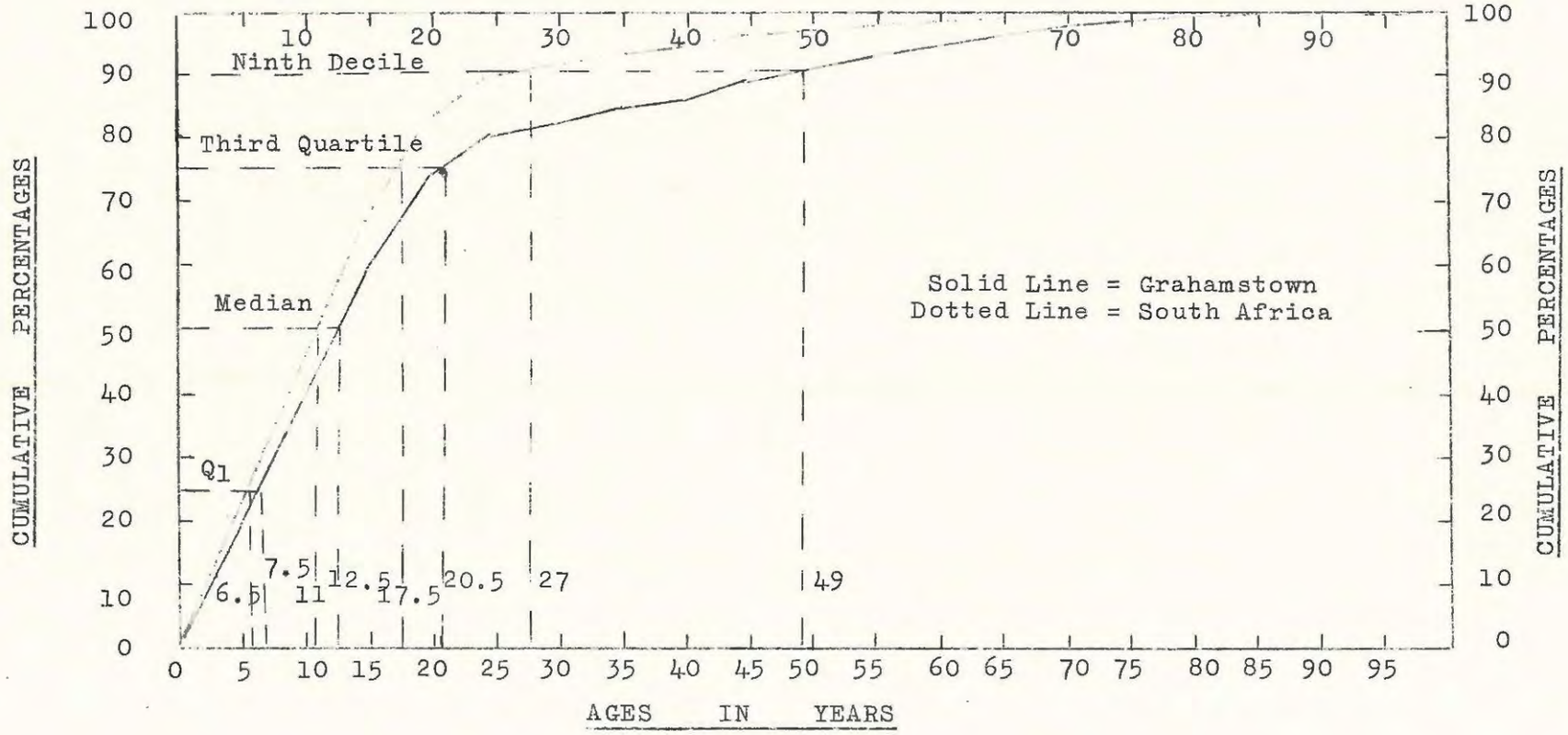
F I G U R E IX.

OGIVES OF THE AGE DISTRIBUTION OF NEVER MARRIED MALES IN THE GRAHAMSTOWN SAMPLE, 1951-2, AND IN THE 1951 EUROPEAN POPULATION OF SOUTH AFRICA.



F I G U R E X.

OGIVES OF THE AGE DISTRIBUTION OF NEVER MARRIED FEMALES IN THE GRAHAMSTOWN SAMPLE, 1951-2, AND IN THE EUROPEAN POPULATION OF SOUTH AFRICA, 1951.



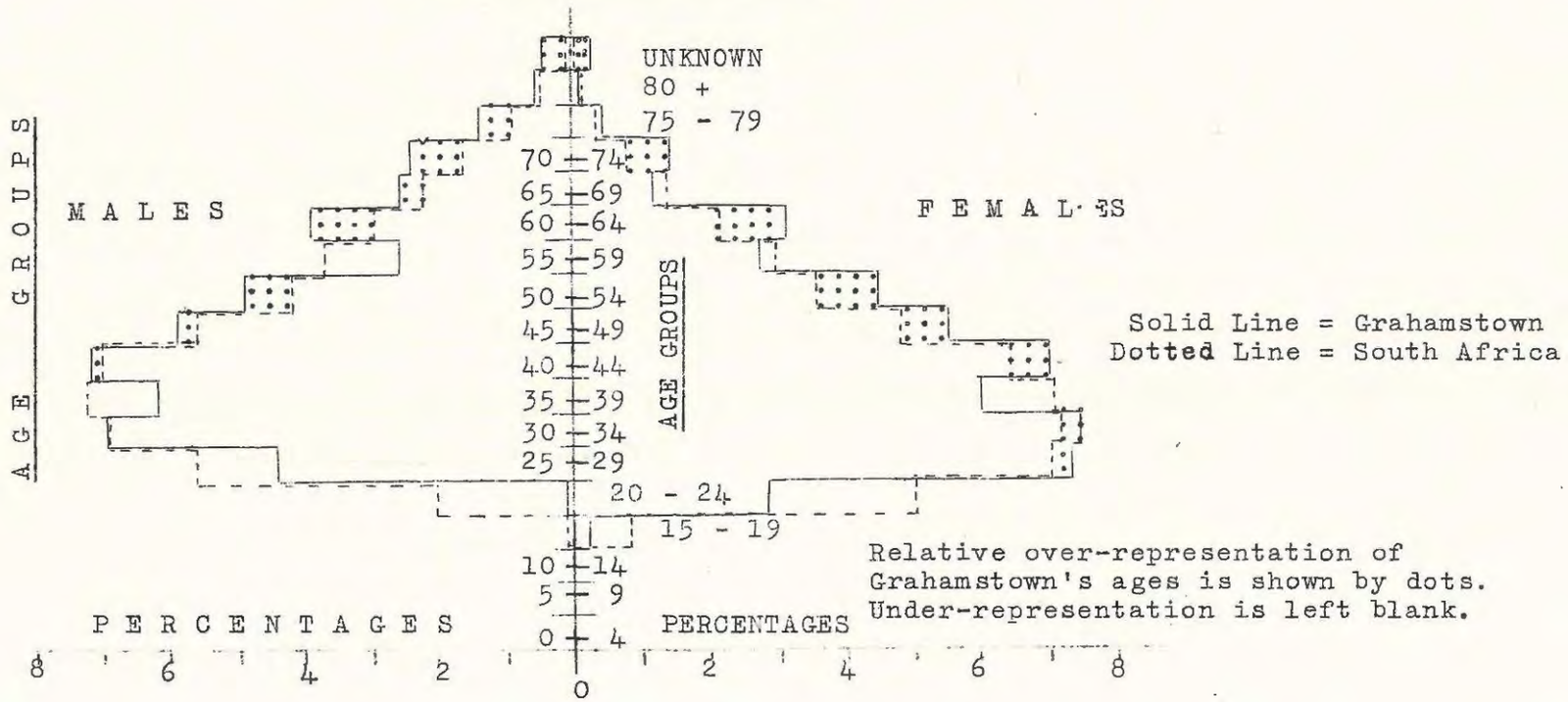
population slightly younger than its counterpart in the Union. In contrast the distribution of unmarried females in the sample differs markedly from the Union's distribution (see Figure X.) The main difference is a marked preponderance of the 20+ age group in the sample. The difference between the two distributions in Figure X is not marked during the early age groups. Thus the first quartile age for Never Married females in the Grahamstown sample is $7\frac{1}{2}$ years, as against $6\frac{1}{2}$ years for the Union; the median age is $12\frac{1}{2}$ years as against 11 years for the Union; and the third quartile age is $20\frac{1}{2}$ years as against $17\frac{1}{2}$ years for the Union. In contrast, the ninth decile for the sample is 49 years of age as against only $27\frac{1}{2}$ years for the Union - the difference in this instance is marked, indicating the marked preponderance of older spinsters in the Grahamstown sample. Again, reading from the graph, the 40+ years age group in the Grahamstown sample of Never Married females forms 15% of all Never Married females sampled: in the Union's European population the corresponding figure is only 6%. The sample of Never Married persons therefore differs from the Union's norm in several noteable respects - and the female distribution departs more from the norm than does the male distribution.

The data for the Married group have been graphed in Figures No. XI (age-sex pyramid), XII, and XIII (ogives) on pages 225 to 227. The general pattern revealed by these three graphs is that on the whole the sample of married persons from Grahamstown follows the Union's pattern, except for the older average age of the sample population - due to a relative absence of young married persons under 40 years of age, and a relative over-repre-

F I G U R E XI.

AGE-SEX PYRAMID OF MARRIED EUROPEANS, GRAHAMSTOWN SAMPLE 1951-2,

AND SOUTH AFRICA, 1951.



F I G U R E XII.

OGIVES OF THE AGE DISTRIBUTION OF MARRIED MALES IN THE GRAHAMSTOWN SAMPLE, 1951-2, AND IN THE EUROPEAN POPULATION OF SOUTH AFRICA, 1951.

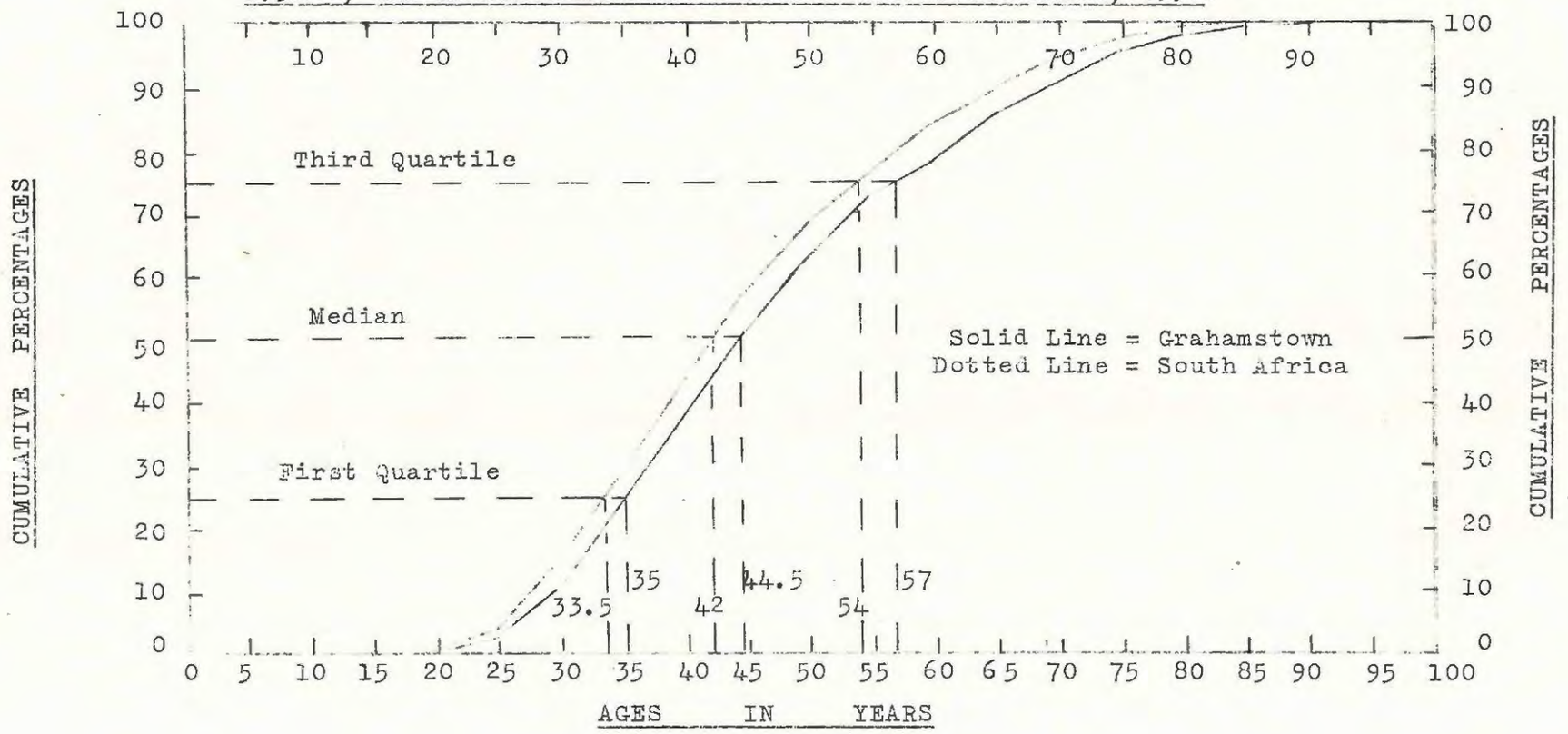
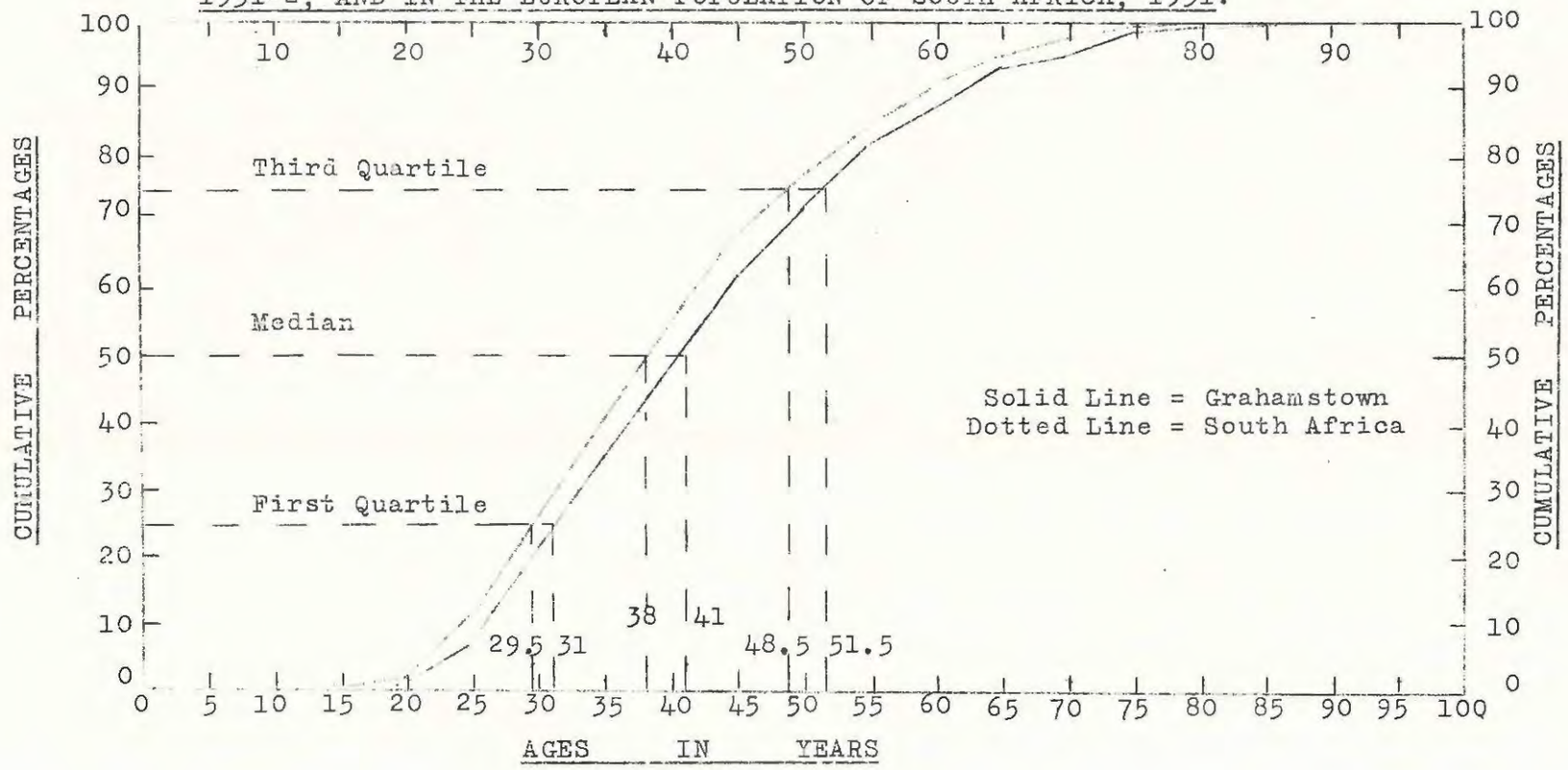


FIGURE XIII.

OGIVES OF THE AGE DISTRIBUTION OF MARRIED FEMALES IN THE GRAHAMSTOWN SAMPLE, 1951-2, AND IN THE EUROPEAN POPULATION OF SOUTH AFRICA, 1951.

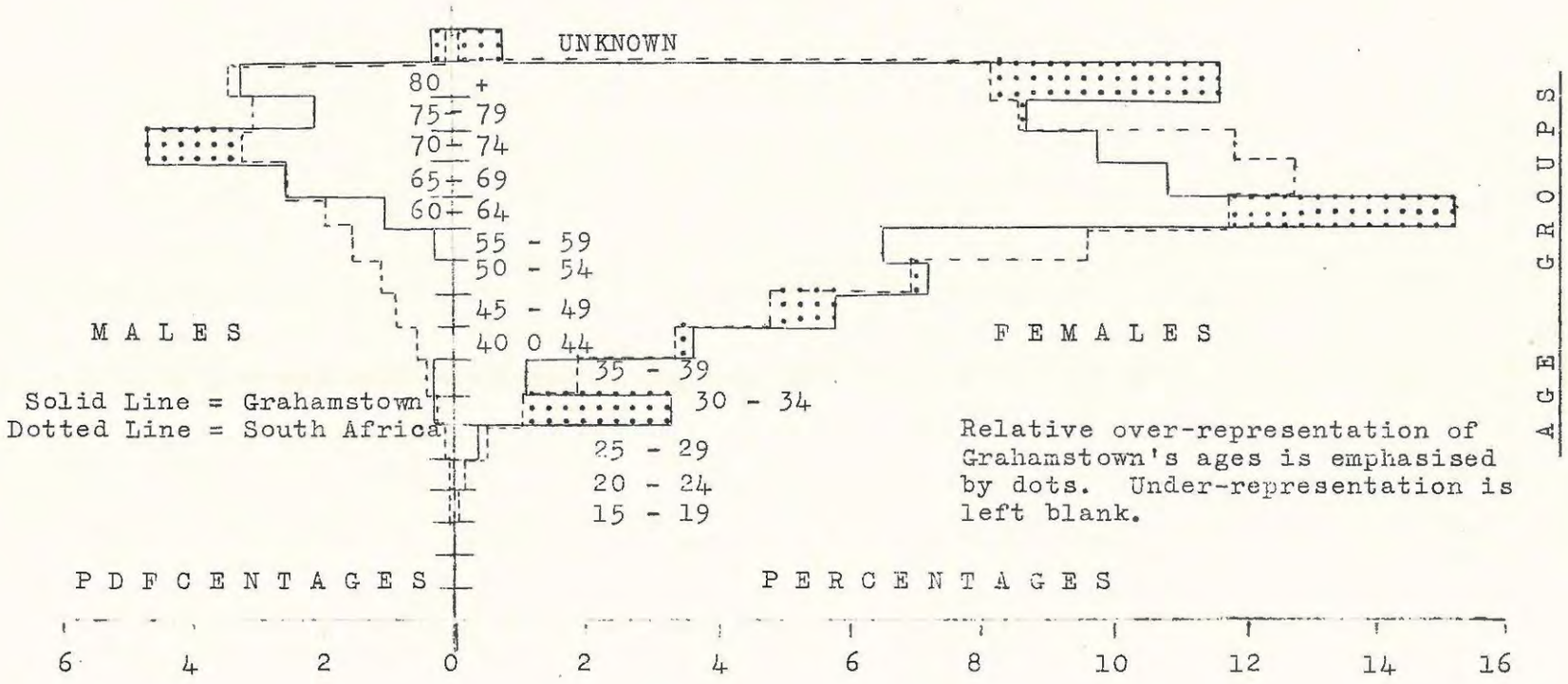


sentation of the 40+ age groups. This is probably a true reflection of the actual picture in the town, and if so, it is suggested that this is the result of little demand in the town for the labour of younger persons, but a fairly strong demand for professional workers with a certain amount of experience behind them - i.e. persons who tend mainly to fall into the older age groups. This is again a reflection of the selective forces of labour demand exerted by the town's peculiar economic structure and static nature.

The age-sex structure of widowed persons in the Grahamstown sample is shown in Figure XIV, page 229. It should be remembered that the total number of widowed males in the sample amounted to 42 persons. This number is considered too small to make a break-down by age worth analysing, so that no comments are offered. Consequently, only the ogive for the female distribution is given, (Figure XV, page 230.) The main feature revealed by Figure XIV is that although the age-sex pyramid (Figure XIV) reveals quite wide individual variations between the Union's and the sample's female widowed population, the over-all trend of the two populations is undoubtedly similar. The question arises of how far the wide variations in the sample distribution are merely a function of the size of the sample (234 widows) and that the trend is a better indication of the position in the town. This is unfortunately a question which we cannot answer, but it is wise to exercise caution in the interpretation of Figure XIV. It seems safe to state that it appears that there is somewhat of an over-representation of older widows - this may well be a corollary of the attraction of the town for retired persons, and the

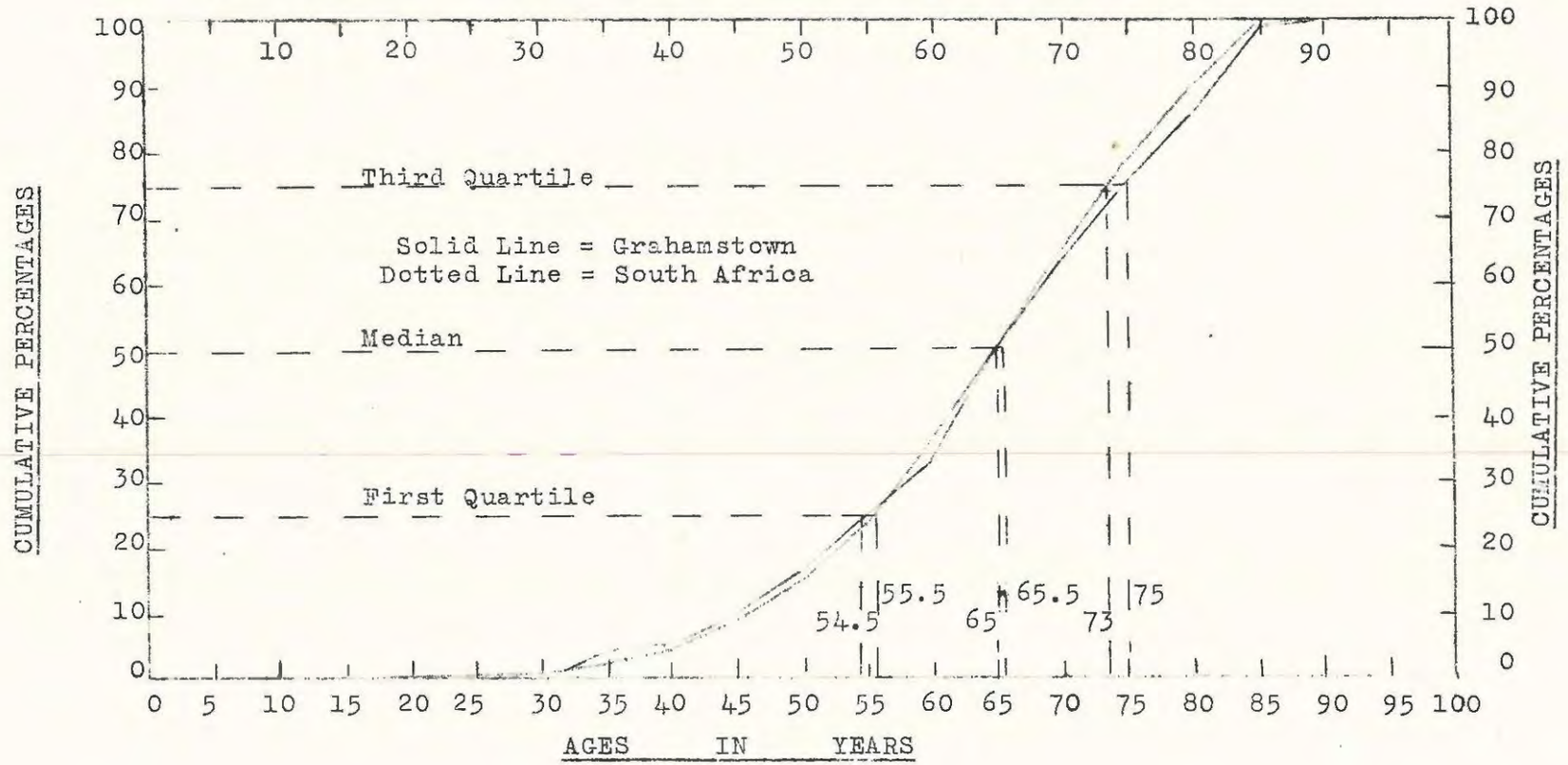
FIGURE XIV.

AGE-SEX PYRAMID OF WIDOWED EUROPEANS, GRAHAMSTOWN SAMPLE, 1951-2, AND SOUTH AFRICA, 1951.



F I G U R E XV.

OGIVES OF THE AGE DISTRIBUTION OF WIDOWED FEMALES IN THE GRAHAMSTOWN SAMPLE, 1951-2, AND IN THE EUROPEAN POPULATION OF SOUTH AFRICA, 1951.



slightly greater life expectancy of women, so that the wives of retired men in the town tend to outlive the men themselves. Further than this statement, one cannot go with the size of the sample available, when age is a breakdown.

No analysis has been attempted of the age-sex structure of divorced persons in the Grahamstown sample, in view of the fact that only 36 cases were involved.

Finally, to conclude this section on the marital status of the Grahamstown sample, we turn to interpret the findings in connection with the relative distribution of the marital status groups as a whole, given on pages 213 - 4 above, in the light of the additional findings resulting from the age-sex distribution analysis of marital status: First of all, the relative under-representation of divorced persons in the town cannot be studied in terms of any particular age groups, as the numbers involved are too small. It is likely though that the town in fact has a lower over-all divorce rate, and that this is a feature common to smaller towns in the Union. The relative over-representation of widowed persons in the town is possibly the inevitable result of the attraction of the town for retired persons. It is also possible that the town may attract widowed persons themselves. Whatever the reason, it seems possible that there is a slight excess of old widowed persons in the town, and this would fit in with the theory that a good proportion of the widowed persons are drawn from the retired ranks. As far as the married group is concerned, it is suggested that the relative over-representation of married males in the sample is a function of the relative absence of young unmarried males in the town, leading to an over-weighting of the

existing married male population. The relative under-representation of married females in the sample is probably a function of the excess of old and middle-aged spinsters.

The brief conclusion of this section is that the age-sex marital status distribution of the population of Europeans living in houses in Grahamstown - and probably also of the total population of Europeans in the town - exhibits certain important departures from the norms provided by the European population of the Union. As these "abnormal" features are inevitably the result of the economic and social structure of the town, they indicate powerful selective forces operating as a result of the static nature of the town. The population structure of the town provides an index of the nature of the functioning and dynamics of Grahamstown, - which seem basicly to be those of retardation, and restricted growth.

5. Home Language of the Sample Population:

The distribution of home languages among the sample of Europeans from Grahamstown is shown in Table XVIII below:

TABLE XVIII

DISTRIBUTION OF HOME LANGUAGES AMONG THE SAMPLE OF EUROPEANS FROM GRAHAMSTOWN, 1951-2.

HOME LANGUAGE	HOUSES		HOUSEHOLDS	
	No.	%	No.	%
English	743	77.0	806	77.3
Afrikaans	170	17.6	182	17.4
Bilingual	40	4.2	43	4.1
Yiddish/Hewbrew	3	0.3	3	0.3
German	3	0.3	3	0.3
Dutch	2	0.2	2	0.2
Dutch & English	2	0.2	2	0.2
French	1	0.1	1	0.1
Yiddish & English	1	0.1	1	0.1
T O T A L	965	100.0	1,043	100.0

This table shows that in the European population of Grahamstown, it is likely, on the basis of our sample, that the predominant language spoken is English, and that English, Afrikaans, and English and Afrikaans together account for nearly all the home languages spoken. In the sample only 1.2% of the households sampled had a home language other than English and/or Afrikaans. In terms of home languages therefore, the town is a predominantly English-speaking town, with a fairly homogeneous population - the cosmopolitan language character of many large urban areas is lacking in the small town.

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The conclusions of this chapter, along with the other conclusions of this study, are given in the last chapter, so that it is not necessary to sum up this chapter at any length at this stage. Suffice it to say that the main conclusion is that Grahamstown, a town which has remained predominantly English-speaking in character since the days of its foundation, has since about the mid 19th. Century suffered from a retardation of its growth - especially in the case of its European population. The over-all age structure of the population is, to-day, that of a static population, and the age-sex composition and marital status composition of this population appear to depart in some respects from the norm provided by the total population of the Union. It is suggested that these "abnormal" features are further indices of the static nature of the present-day town.

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CHAPTER XII.

THE OCCUPATIONAL STRUCTURE OF THE EUROPEAN POPULATION.

The Land Utilisation Map for the town (Map No. 6) gives an idea of the town's economic structure. Industrial uses are, with one or two exceptions, confined to small enterprises, and to-day the town is more characterised by the absence of industry than by its presence. The potteries and brickfields constitute the only major industry of the town - the clay deposits of the town are said to be excellent, and constitute, apart from quartzite, the only other known important raw material possessed by the town. According to the picture shown by this Land Utilisation map, therefore, commerce, administration and education - that is non-industrial uses - go to make up the main economic land uses of the town, and so by deduction form the main stay of the town's economy. It is to be expected that this will be corroborated by the picture shown by the occupational structure of the European population of Grahamstown.

Our knowledge of the occupational structure of this population is obtained from the house to house survey, and the sample which it yielded. The problem of the classification of the occupations in the sample was a difficult one: there are several different types of occupational classifications which an investigator can use, and it is not neccesary to discuss them all here. It was intended to use some system of classification which more or less represented the socio-economic class structure of Grahamstown, and for this purpose the census classification was not entirely suitable. (While the classification used for the 1951 census is an international one, and so has the advantages of

being comparible with classifications used in other countries, it did not meet the criterion of socio-economic class differentiation adequately. After a careful study of the all the different classifications which have been used by various studies, it was decided to devise a system of classification based on those used by the Merseyside Survey(1) and the Cape Town Survey(2) (which adapted the Merseyside Survey classification.) In following the principle laid down by the Cape Town Survey that persons grouped together should be persons who normally mix socially, the classification finally drawn up did not follow slavishly the lines of either of the two classifications mentioned, but was adapted to suit the local social conditions prevailing in Grahamstown (as assessed by the investigator after some years residence in the town.) An attempt was made to draw up a system which would realistically portray the socio-occupational structure of the town. The final form of classification which was adopted after a good deal of experimentation is as follows:-

OCCUPATIONAL CATEGORIES USED IN THE SURVEY OF THE EUROPEAN POPULATION OF GRAHAMSTOWN.

A -- HIGHER PROFESSIONAL AND ADMINISTRATIVE CLASS

B -- INDEPENDENT COMMERCIAL, AGRICULTURAL AND MANAGERIAL CLASS

C -- SUBORDINATE COMMERCIAL, CLERICAL AND CERTAIN PERSONAL SERVICES CLASS

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(1) The Social Survey of Merseyside: D. Caradog Jones (ed.): University Press of Liverpool: Hodder & Stoughton, London, 1934. See Vol. III, p. 522, and Note 3, Appendix, pp. 554-5.

(2) University of Cape Town: Social Science Department: The Social Survey of Cape Town: See reports SS6, and SS8.

D -- SKILLED MANUAL WORKERS

E -- MANUAL WORKERS IN SUPERVISORY POSITIONS, OR POSITIONS WITH AN ELEMENT OF RESPONSIBILITY

F -- SEMI-SKILLED MANUAL WORKERS

G -- UNSKILLED LABOURERS AND MANUAL WORKERS

H -- OCCUPATIONS NOT ACTIVELY ENGAGED IN EARNING A LIVING - RETIRED, DISABLED, INDEPENDENT, STUDENTS, AND OTHERS

I -- UNSPECIFIED

J -- UNEMPLOYED

Groups C and H were subdivided as follows:

C -- SUBORDINATE COMMERCIAL AND CLERICAL CLASS

C_1-- CERTAIN TYPES OF PERSONAL SERVICE

H -- RETIRED OR PERSONS WITH INDEPENDENT INCOME

H_1-- STUDENTS

H_2-- DISABLED OR SICK PERSONS UNABLE TO WORK

H_3-- OTHER NOT GAINFULLY EMPLOYED PERSONS - HOUSEWIVES, etc.

A more detailed classification of the above system of occupational classification is given in Appendix I, where examples of the type of persons classified into each category are given.

Table XIX below gives the occupational classification of the Europeans sampled from houses in Grahamstown:

SEE TABLE XIX OVER THE PAGE

TABLE XIX

OCCUPATIONAL DISTRIBUTION OF PERSONS AGED 15+ YEARS OLD, GRAHAMSTOWN, 1951-2.

OCCUPATIONAL CATEGORY	Males	Females	Total
A. Professional & Administrative	161	44	205
B. Independent Commercial, etc.	95	-	95
C. Subordinate Commercial, Clerical	212	222	434
C_1 Certain Personal Services	63	66	129
D. Skilled Manual	157	-	157
E. Supervisory & Responsible Manual	55	-	55
F. Semi-skilled Manual	143	17	160
G. Unskilled and Labouring	11	-	11
H. Retired and Independent Means	127	114	241
H_1 Students H_2 Disabled or Sick H_3 Not gainfully occupied: other	152	1,059	1,211
I. Unspecified	34	9	43
J. Unemployed	6	1	7
TOTAL	1,216	1,532	2,748

In this table, the categories of students, disabled and sick persons, and other persons not gainfully occupied had to be grouped together, as many of the survey returns were not specific enough to allow a separation of these categories to be made. In the table, categories A to G represent persons who are gainfully employed: the total number of males in these categories equals 897, and the number of females 349 - a total of 1,246 gainfully employed persons.

It must be borne in mind that this table is based on a sample of Europeans drawn from houses in the town, and so cannot generalise for the total population of Europeans in the town. In Appendix H it is pointed out that in view of the nature of the population of Europeans not living in houses, it is likely that the sample, portrayed in the above table, under-estimates, relatively, the proportion of non-manual workers in the European population of the

town. This possibility must be remembered when analysing Table XIX.

In itself, Table XIX it not particalarly instructive, and some norm is needed before the pattern presented by this table can be fully understood. As has been done before with other phenomena relating to Grahamstown, so now also the occupational structure of the population sampled will be compared with the European population of the Union. The latest published census data relating to the occupational structure of the European population of South Africa is for 1946, so that it is with the population at this date that the figures for Grahamstown during 1951-2 must be compared:

Volume V of the 1946 Census Report, entitled "Occupations and Industries of the European, Asiatic, Coloured and Native Population" (U.G. 41 of 1954), provides data concerning the occupational distribution of the 1946 European population of South Africa, aged 15 years and over. The census data are grouped on a different basis from that which has been adopted for our data for the Grahamstown sample. For our purposes, the census classification is most unsatisfactory, as such classes as farmers and farm labourers, or professors and acrobats are grouped together, without any regard for socio-economic class differentiation. If we are to compare the data for Grahamstown with this census data, then we must first of all re-group the census data. In re-classifying the census figures, occasionally some difficulties were encountered. For instance, more than once a group of persons includes persons of widely varying degrees of skill and social status. Thus, refrigeration engineers and mechanics are grouped together, so that artisans and professional men can be

grouped into one class - this occurs on several occasions, where mechanics and engineers are grouped together. Again, to give another example, "drillers" includes hand, pneumatic and electric drillers, who thus can range from labourers breaking up the streets to skilled precision workers. Often it is therefore impossible to determine the numbers of workers included in the usual skilled, semi-skilled and unskilled categories, and to decide who are professional men and who are manual workers. For this reason, wherever doubt occurred, persons were grouped rather in the lower applicable occupational category than in the higher. Thus, the actual number of skilled and semi-skilled workers in the European population of South Africa in 1946 may have been somewhat lower than the figures actually given below, and the number of non-manual workers for the same reason are probably an under-estimation of the actual position. However, it is considered that the broad picture which is given by the re-classification below is reasonably near to the actual position, and that satisfactory comparisons with the Grahamstown figures are possible. The re-grouped census data are given in Table XX below:

SEE TABLE XX OVER THE PAGE.

TABLE XX.

RE-CLASSIFICATION OF THE 1946 EUROPEAN OCCUPATIONAL CENSUS DATA FOR SOUTH AFRICA.(3)

OCCUPATIONAL CATEGORY	MALES	FEMALES
A. Professional & Administrative	41,792	3,585
B. Independent Commercial etc.	159,208	8,555
C. Subordinate Commercial, Clerical	127,627	109,192
C_1 Certain Personal Services	13,851	24,472
D. Skilled Manual	113,233	1,490
E. Supervisory etc. Manual	70,501	524
F. Sem-skilled Manual	89,114	27,476
G. Unskilled & Labouring	71,312	5,744
H. Retired & Independent Means	45,007	22,997
H_1 Students and Scholars	62,633	45,360
H_2 Dependants: Other	9,727	13,604
H_3 Not Gainfully Occupied: Other	-	551,011
I Unspecified	10,374	2,254
J Unemployed	4,163	3,579
Other Occupied Not Classifiable	524	278
T O T A L	819,066	820,121

As Grahamstown is an urban area, the number of persons engaged in agriculture, and included in the survey of the town, was negligible. Thus, the data in Table XX would be more comparible if persons engaged in agriculture were excluded. If we do this, then we have a table as presented over the page - Table XXI:

SEE TABLE XXI OVER THE PAGE

(3) The figures in this table concern the European population of South Africa, aged 15 years and over, at the time of the 1946 census. See: Vol. V., 1946 Census Report: op. cit., Table I, pp. 2 - 19.

TABLE XXI

OCCUPATIONAL DISTRIBUTION OF THE 1946 EUROPEAN POPULATION OF SOUTH AFRICA, AGED 15 YEAR AND OVER, EXCLUDING THOSE ENGAGED IN AGRICULTURE.

OCCUPATIONAL CATEGORY	MALES	FEMALES
A. Professional & Administrative	41,792	3,585
B. Independent Commercial, Managerial	51,351	5,112
C. Subordinate Commercial, Clerical	126,573	109,192
C_1 Certain Personal Services	13,851	24,472
D. Skilled Manual	113,233	1,490
E. Supervisory & Responsible Manual	58,657	488
F. Semi-skilled Manual	87,510	27,438
G. Unskilled & Labouring	34,369	1,365
H. Retired & Independent Means	45,007	22,997
H_1 Students & Scholars	62,633	45,360
H_2 Dependants: Other	9,727	13,604
H_3 Not Gainfully Occupied: Other	-	551,011
I Unspecified	10,374	2,254
J Unemployed	4,163	3,579
Other Occupied Not Classifiable	524	278
T O T A L	659,764	812,225

TABLE XXII

PERCENTAGE DISTRIBUTION OF OCCUPATIONS IN THE GRAHAMSTOWN SAMPLE, AND THE SOUTH AFRICAN EUROPEAN POPULATION, 1946.

CATE-GORY	% GRAHAMSTOWN, 1951				% SOUTH AFRICA, 1946			
	M	F	M	F	M	F	M	F
A.	13.3	2.9	18.0	12.6	6.3	0.5	7.9	2.1
B.	7.8	-	10.6	-	7.8	0.6	9.8	2.9
C.	17.4	14.5	23.6	63.6	19.2	13.5	24.1	63.2
C1	5.2	4.3	7.0	18.9	2.1	3.0	2.6	14.2
D.	12.9	-	17.6	-	17.2	0.2	21.5	0.9
E.	4.5	-	6.1	-	8.9	0.1	11.0	0.0
F.	11.8	1.1	15.9	4.9	13.3	3.4	16.6	15.9
G.	0.9	-	1.2	-	5.2	0.2	6.5	0.8
H.	10.4	7.4	100.0	100.0	6.8	2.8	100.0	100.0
H_1-H_3	12.5	69.2			11.0	75.0		
I.	2.8	0.6			1.6	0.3		
J.	0.5	0.0			0.6	0.4		
TOTAL	100.0	100.0	-	-	100.0	100.0	-	-

The category "Other Occupied: Not Classifiable" has

been omitted from the totals in Table XXI when calculating the percentages for Table XXII. The latter table shows the percentage distribution of both the Grahamstown sample, and of the re-classified 1946 census figures: the percentages for both the complete occupational distribution, including the Not Gainfully Occupied, Unemployed, and Unspecified categories, and also for the Gainfully Occupied categories only (Categories A - G) are given.

Before comparing the detailed percentage distributions of the Grahamstown sample and the 1946 European census population, we study some rates and ratios which have been calculated from Tables XIX and XX:

In the Grahamstown sample, there were 531 non-manual workers (categories A - C_1) and 366 manual workers (categories D - G) who were males. Thus, the ratio of non-manual to manual male workers is 531:366 = 1.45. Similarly, in the 1946 European census population the ratio of non-manual to manual male workers was 233,567: 293,769 = 0.80. This suggests that the proportion of non-manual workers in Grahamstown is relatively larger than in the Union, and that non-manual workers are noticeably under-represented. It must be remembered that as the Grahamstown figure is derived from a sample, it is subject to error (to an unknown extent, as the sample was a judgement and not a probability sample.) From what is known of the unsampled population of Europeans in the town, it is considered likely that non-manual workers also out-number manual workers, and that we may reasonably conclude that in fact the European population of the town is mainly a non-manually occupied population. This emphasises the absence of industrial enterprises in Grahamstown and shows that the main economic activities

of the town are non-manual - i.e. professional, administrative, commercial, and certain types of personal services. Few single indices about Grahamstown can be more revealing than this simple ratio of non-manual to manual workers - the ratio speaks volumes about the structure and life and of the town, and reinforces the description of the town, given in Part A of the section on the town to-day (see the end of Volume I), which indicates that to-day the town is mainly an educational town, and an administrative and commercial centre for the surrounding region.

We can express the above figures in a different relationship, by relating the number of non-manual and manual workers in the sample to the respective number of workers in the Union, and by multiplying by a thousand, express the relationship as a rate. We now have:-

$\frac{531}{233,567} \times 1,000 =$ 2.27 per thousand non-manual male workers in the Grahamstown sample

$\frac{366}{293,769} \times 1,000 =$ 1.24 per thousand manual male workers in the Grahamstown sample

As we are comparing a 1951-2 sample, with 1946 census data, the rates are only estimates of the actual position in 1951. However, it is estimated that 2.27 male non-manual workers out of every thousand in the European population of South Africa were the Grahamstown sample, and about 1.24 per thousand manual workers. These estimates suggest that Grahamstown has relatively almost twice as many male non-manual workers as manual workers.

Following the same principle, the female figures are as follows:

In the Grahamstown sample, the figures of non-manual

to manual female workers are 332:17 = 19.52. The 1946 South African census figures for European females were 142,361:30,781 = 4.63.[4] With a difference of about four times between the two ratios, the non-industrial nature of Grahamstown's economy is even further emphasised. Expressing the Grahamstown figures as rates per thousand to the base of the Union's figures, we have:

$\frac{332}{142,361} \times 1,000$ = 2.33 per thousand non-manual female workers in the Grahamstown sample

$\frac{17}{30,781} \times 1,000$ = 0.55 per thousand manual female workers in the Grahamstown sample

Thus, while the estimated female rate for non-manual workers of 2.33 is not so very different from the rate of 2.27 for the male non-manual workers - showing, if these rates are fairly accurate (and there is no reason to suppose that they are not) that relatively the proportionate representation of the male and female non-manual workers in Grahamstown is about the same. However, the estimated rate for female manual workers of 0.55 is lower than the estimated male rate of 1.24. As most female manual workers are employed by factories, this shows the almost complete absence of factories in Grahamstown, and further shows the marked concentration on commercial and professional and administrative activities by the town. Historically Grahamstown never was an important industrial centre, and this character of the town's economy has not changed to-day.

We now turn to examine Table XXII, and make a rather more detailed comparison of the occupational structure of

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(4) All the rates and ratios for the 1946 census data are from Table XXI, and exclude figures for those in agriculture.

the Grahamstown sample with that of the 1946 European population of South Africa. In interpreting the data, caution must be used, for small differences between the Grahamstown and the Union's figures can be due to nothing more than sampling errors. Dealing with the males first of all, we note that the percentage size of categories B (Independent Commercial, Managerial), C (Subordinate Commercial, Clerical), F (Semi-skilled), H_1 -H_3 (Students, Scholars, Dependants, Other Not Gainfully Occupied), and J (Unemployed) are about the same in the sample and Union population. The major difference therefore is due to an over-representation of category A (Professional and Administrative), C_1 (Certain Personal Services), and H (Retired and Independent Means); and due to an under-representation of categories D (Skilled), E (Supervisory and Responsible Manual), and G (Unskilled and Labouring) in the Grahamstown sample. This underlines the description of Grahamstown which has already been given - it is a town where professional activities constitute a major activity of the town, a town with several hospitals (Male Nurses are largely responsibly for the relative over-representation of category C_1), and a town which attracts retired persons and pensioners. It also appears as a town offering little scope for manual workers - Grahamstown is not an industrial town. In this respect, it may be suggested that any migration of young men out of the town (which was suggested in the previous chapter) would particularly involve men in the manual working class, and not only men in non-manual occupations. The pattern followed by females is the same as that evinced by the males, so that there is no need

to repeat the pattern again. Both the male and female sample occupational distributions present the same picture of the town.

Briefly summing up the conclusions of this chapter, it may be stated that the picture of Grahamstown presented by the distribution of occupations in the sample is a clear one, and agrees with previous descriptions of the town. It may thus be assumed that the sample presents a reliable picture of the town, and that the conclusions of Chapter X (which were based on data not subject to sampling errors), and of Chapter XI, are further reinforced by the findings of this chapter. Grahamstown is essentially an educational and administrative town, and a service centre for the surrounding region, and so has a population which is, relative to the Union as a whole, weighted with non-manual workers, and showing a relative absence of manual workers. The commercial activity of the town does not seem to be more than average in terms of the proportion of persons involved. As a non-industrial and rather static town, Grahamstown attracts retired and pensioned persons. It does indeed present a pattern which may well be typical of many other small towns in South Africa ....

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PART C : THE ECOLOGICAL STRUCTURE OF GRAHAMSTOWN

CHAPTER XIII

A PRELIMINARY DETERMINATION OF NATURAL AREAS AND ZONES IN THE TOWN.

In order to make this ecological analysis of Grahamstown as meaningful as possible, it is necessary at the very outset to provide a preliminary delineation of the various natural areas and ecological zones in the town. This will provide some basis for understanding the ecological distribution of the various phenomena studied in this section. At the end of the section, once all the data have been presented, a final delineation of the various zones will be made, using all the various indices presented in the section. The indices chosen in this chapter for a preliminary analysis of the ecological structure of the town are key indices, which are known to be closely bound up with the ecological structure of any community. In order to avoid possible errors due to sampling, all the indices used for this preliminary analysis are based on complete counts - data from the sample survey of the European Area of the town are presented in subsequent sections.

1. The Land Use Pattern of Grahamstown:

One of the basic indices used in discovering the ecological pattern of a community is land use - a map showing the distribution of this asset shows part of the ecological patterns involved in the area concerned. As competition for land is the basic force or process resulting in the development of ecological patterns and processes, land use is the outward and visible sign of the effects which this perpetual process of competition

h a s had on the development and spatial distribution of the community.(1) The investigator undertook a land use survey of the European Area of Grahamstown. As no use was made of a team for the survey, the data have been collected by the investigator alone, so that definitions and methods used were consistent throughout. The results of the survey are presented in Map No. 6 in the atlas.

The over-all pattern shown by Map No. 6 is a clear one, and has been generalised for convenience sake in Map No. 7. The commercial and business centre of the town occupy a narrow ribbon on either side of the main street, High Street, and Bathurst Street from Church Square to Beaufort Street. The centre is thus essentially a "facade" along High Street, the sides of Church Square, and Bathurst Street. This facade development, with the lack of depth behind it, emphasises the limited demand for land in the centre of the town, and points to the small-town nature of Grahamstown. Like all such towns, Grahamstown's centre is strung out along the main street or streets, which are few in number (in this case only two), and behind these streets the transition from the centre is rapid, often abrupt. Unlike a larger city such as Johannesburg or Durban, where the central core of the town solidly occupies an area with depth behind the main streets, there is practically no depth to the central core of Grahamstown.

In the land use survey which was undertaken, a detailed study of the types of shops in the town was made. No map

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(1) For a concise description of ecological concepts see: E. Llewellyn and A. Hawthorn: "Human Ecology" in Twentieth Century Sociology: G. Gurvitch and W.E. Moore (eds.): The Philosophical Library, New York, 1945, pp. 466 - 499.

showing these data is presented, as it is possible to describe satisfactorily the pattern involved. The shopping centre of the town has its focal point at the south side of High Street, in Church Square - i.e. from Hill to Bathurst Streets. The shops here are the major ones in the town, and include a branch of a firm which has a chain of department stores throughout the country. As one moves away from this focal point, the size and quality of the shops deteriorate. The standard of the shops east of Church Square along High Street, form a gradient, so that the shops at the bottom of the street near the station are small shops catering essentially for poorer customers and Natives. This east end of High Street is nearer the Non-European locations, and has immediately behind it an interstitial area of mixed residential and non-residential uses (this area will be found to be a racially intermixed area - see page 265-6 below:), so that customers come from the locations and the poorer racially intermixed interstitial area. Similarly with Bathurst Street, the further south of Church Square one moves, the more the character of the shops change to that of small shops which mainly cater for less wealthy customers. Along Beaufort Street, east of Bathurst Street, the shopping centre continues. Here most of the shops are small general dealers, catering for the Non-Europeans from the locations, (Beaufort Street is the highway to the Non-European locations), and poorer Europeans in the racially intermixed area behind, and the Settlers' Hill area almost across the road. A few shops are also found in New Street, behind High Street. This area is a transitional one, which will be shown below to be a poorer one, so that again the shops are small, mainly being of the grocery or general dealer type. The

transitional areas around the core of the town thus have bordering them or actually in them the small type of shops, characteristic of these types of areas. It is significant for instance to note that the three second hand dealers in the town have shops bordering the racially intermixed area, and two of these shops are situated so that they can also serve the Settlers' Hill area.

The main shopping centre and business core of the town are on the tongue of higher ground between the two streams of the Kowie River which meet near the station (see the contour map, No. 4 in the atlas.) This part is higher than the main part of the basin in which the town lies, and historically is the higher ground on which Colonel Graham sited his headquarters, which were later to grow into Grahamstown.(2) This centre, being roughly in the middle of the hollow in which Grahamstown is sited, forms a natural choice for the centre of the town. In consequence the topography of the area appears to have determined the site of the centre of the town, which has not shifted since the foundation of the town in 1812.(3)

Around the central commercial core of Grahamstown, a zone of mixed land uses exists. On lower-lying ground surrounding the central tongue of land, this zone forms a transitional zone between the centre and the residential areas proper. The land uses involved range from commercial and one or two odd industrial uses, to playing fields, waste and semi-waste land, some market gardens, and houses.

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(2) See Vol. I, p. 24 above.

(3) This may be taken as another index of the static nature of Grahamstown, for it often happens in a large, dynamic community, that the centre of the town shifts somewhat - even if only a few blocks - with the passage of time.

Beyond this, there is a zone of residential uses, mixed with educational institutions - this zone circles the transitional zone around the central business district. Beyond this zone, there is a purely residential zone, The pattern is thus for roughly concentric zones around the centre of the town. East of the centre of the town, between the Non-European locations and the transitional zone, there is the main industrial area, and several cemetries, which serve as a buffer between the European and Non-European areas. Towards the south-east, this industrial buffer tends to be replaced by market gardens, and waste land. Towards the north-east, this buffer zone becomes less marked, and is mainly residential in character, with only two factories present to mark its existence.

It should be mentioned that Map No. 6 shows that generally the course of the Kowie streams in the town are characterised by open space or sparse development. Playing fields, market gardens, nurseries, waste land, or only sparse development are found along a good deal of the length of the stream beds. This is due in part to the fact that the area adjoining the streams is a natural choice for the location of market gardens and nurseries - the streams are dry except during heavy rains, but boreholes sunk in or bordering the stream beds yield a plentiful supply of water. Another reason is the danger of flooding when there is a really heavy precipitation of rain, and experience in the town has shown that to build on the banks of the streams is to court flood damage sooner or later. The final fact is that often the banks of the streams, and of the land adjoining the banks, slope steeply, and so do not afford a good site for building

purposes. Thus, with only one or two exceptions, the location of playing fields, parks, market gardens and nurseries, and other forms of open space, have been determined by the location of the Kowie streams - by the topography of the site. Furthermore, as will be seen from Map 6, these land uses tend to be characteristic of different zones in the town, so that it may well be that we will find that topography has played a part in determining the location and/or extent of some of the ecological zones in the town. Thus, for instance, it will be seen that the suggested buffer zone between the European Area and the Non-European Areas follows for about half of its length one of the Kowie streams, so that the stream itself, in addition to land uses, forms part of the buffer separating the white and non-white areas. This point will be dealt with again below.(4)

2. Rateable Value of Houses in the European Area:

Rateable value is another key index in determining the existence of natural areas and ecological zones in a community, revealing as it does variations in the "physical quality" resulting from the operation of ecological forces on the different areas in a town. Map No. 8 is an isometric map of rateable values of houses in the European Area of Grahamstown.(5) The pattern revealed by this map is clear.

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(4) See pp. 313-5 below.

(5) This isometric map was based on mean rateable values calculated by the investigator for each street, or in the case of long heterogeneous streets, segments of streets. An isometric map is used, as it presents, in this case at least, a clearer general picture than a choropleth map would. For a description of the technique of constructing an isometric map for sociological data, see: E.R. Mowrer: "The Isometric Map as a Technique of Social Research": American Journal of Sociology: Vol. XLIV, July 1938: pp. 86 - 96.

The commercial centre of the town is largely encircled by areas where the average rateable value per house is under £500. These low rateable value areas correspond with the transitional zone around the centre, which has been identified from the land use pattern in Grahamstown. The suggested buffer or interstitial zone between the European Area and the locations is also identified by this map, and appears as a belt of low rateable value, where the average value is also under £500 per house. During the course of the land use survey, it was observed by the investigator that the housing in these low rateable value areas around the centre of the town, and bordering on the Non-European locations, consisted of small, obsolete and often blighted houses built perhaps 75 to 100 years or more ago. These areas are the slum and semi-slum areas of the town, and appeared to be transitional or interstitial in the fullest sense of the term. It is suggested therefore that the subsequent detailed analysis of the ecological pattern of Grahamstown will confirm these preliminary delineations.

The general pattern for the rest of the European Area is for rateable value to increase in roughly concentric zones as one proceeds from the centre. The full development of complete concentric zones around the centre has been prevented on the eastern side by the presence of the Non-European locations, and on the south side by the Municipal forests, which have prevented expansion further up the slopes of the basin: - the same is true of the western side of the town, where the Municipal forest has also barred expansion. Map No. 8 therefore supports the suggestion of different ecological zones

surrounding the centre of the town, which was put forward on the basis of the land use pattern in the town. It is further suggested that Map No. 8 will probably prove to be a more sensitive measure of various areas in the town than land use taken by itself.

It should be noted that a pocket of small, obsolete houses with a mean rateable value of under £500 is located at some distance from the centre of the town, in the left-hand middle edge of the map. The reason for this is probably an historical accident - this area was settled early in the history of the town, and with a low level of demand for land, the original houses have not been rebuilt, and to-day are obsolete. This area cannot be described as being transitional, and in this respect differs from the other low rateable value areas defined by Map 8. The subsequent detailed analysis of the ecology of the town will reveal the characteristics of this pocket.

Finally, in connection with Map 8 it is worth noting that a comparison between this map and the contour map (no. 4) reveals some association between rateable value and topography. It so happens that the zones furthest from the centre are also sited on the ridge of the basin in which Grahamstown lies, and are the newest residential areas of the town with the highest rateable values. This will be mentioned again subsequently.

3. <u>The Spatial Distribution of Some Indices of Social Disorganisation in the Town</u>:

It is one of the well-established facts of social ecology that the transitional and interstitial areas in any community are areas largely characterised by social disorganisation - or with a higher degree of disorganisation than is found in other areas of the community. Therefore,

a study of the spatial distribution of some indices of social disorganisation in Grahamstown will help to pinpoint the location of the transitional and interstitial areas in the town:

Every community has its social problems, and Grahamstown is no exception. However, as a small and relatively static town it is fortunate in having less signs of social disorganisation than larger more dynamic cities (such as its metropolitan neighbour, Port Elizabeth.) For instance, European crime in the town is negligible,(6) and the incidence of other social problems such as divorce, poverty, unemployment, etc. is lower than in the larger cities of South Africa.

(a) Poverty:

Short of undertaking a special survey of the town, there was no direct way in which it was possible to obtain an idea of the incidence and distribution of poverty in the European population of Grahamstown. However, indirect indices of some cases of poverty can be found by studying government maintenance grant, and disability grant, cases. The ecological distribution of these cases will give an adequate idea of where the poor Europeans in Grahamstown are located. Permission to gain access to the records of the local Social Welfare Department Office was obtained,(7)

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(6) When interviewed in 1953, the magistrate of Grahamstown stated that of all the towns he had been magistrate of, Grahamstown was, as far as European crime was concerned, the "quietest." Cases of European crime in the town were very rare - and so have not been studied, except in the case of delinquent children - see p. 256-7.

(7) Access was also obtained to the records of the local Child Welfare Society, and cases were extracted, for the period 1947 - 1951. However, as nearly all the cases were duplicated by the maintenance grant data, they have not been presented in this study.

and cases of European maintenance and disability grants for the five year period 1947 - 1951 were extracted - a five year period was chosen in order to obtain a sample large enough to make mapping of the data worthwhile. These cases have been spot mapped on Map No. 9.

Examining Map 9 it will be noticed that some of the cases actually occur in the area demarcated as Non-European, showing that some Europeans in the town have invaded the area of other racial groups, along the boundary between the white and non-white areas. This area is thus definitely a transitional area. Examining the rest of the map as a whole, it will be seen that maintenance and disability grants occur almost entirely in the area defined by Map No. 8 as being under £1,000 in average rateable value per house. Within this large zone, there is a marked concentration of cases in the areas defined previously as being of low rateable value - i.e. with an average value per house of less than £500. The spatial distribution of these cases therefore corresponds with the areas around the centre of the town, consisting of three main areas (one to the north, and two to the south of the main street of the town, High Street), and with the buffer area bordering on the Non-European locations, which have been described above as the transitional zones in the town. In terms of the index used, these areas are the poorest areas of the town, and has already been said, are the obsolete, blighted areas of the town.

(b) Children's Court Cases:

As far as crime was concerned, the incidence of European adult cases was too small to warrant study.

Children's Court cases were small in number (only 12 cases involving 26 children during the period 1947-51), but they provide useful indices of neglect and broken homes. The location of these cases is also shown on Map No. 9. It is obvious that the concentration of the location of these cases corresponds with the areas defined by maintence and disability grants - almost all the cases occur in the under £500 rateable value areas defined as transitional areas around the centre of Grahamstown, and bordering the non-white locations.

(c) Problem Children, and Mentally Retarded Children:

The home background of children in special deviate classes in government schools in the town - children who presented either problems of behaviour, or mental defects - was investigated from the official school records for the children concerned. Where the home of a child showed signs of extreme poverty, or of being unstable and disorganised, the case was extracted. These cases have also been plotted on Map No. 9, and serve as a further index of the location of poverty and social and personal disorganisation within the area. Again, almost every one of the cases fall into the low rateable value transitional or interstitial areas of the town. The over-all picture presented by Map No. 9 is therefore clear, and the various indices of social disorganisation all point to the same areas of the town as constituting the problem areas. Of the transitional areas, there can be no doubt that the two to the south of the centre of the town - the Kowie Street area, and the Settlers' Hill area - are the worst in terms of concentration of the various types of problem cases.

(d) Unemployment in the Town:

Cases of European unemployment in the town during 1947 to 1951, handled by the Department of Labour's Office in Grahamstown, were obtained. As it was found that the male and female cases clustered in the same areas, and so often made it impossible to fit all the dots in on the scale used, only male cases of unemployment have been mapped on Map No. 10. Examining this map, it will be seen that nearly all the cases of unemployment fall into the inner zone of the town previously defined as being of less than £1,000 rateable value, on the average, per house, and that the vast majority of these cases occur in the innermost zone, with less than £500 average rateable value, around the centre of the town, and in the buffer zone along the border of the Non-European locations.

Five indices of social disorganisation have been plotted on Maps No. 9 and 10, and both maps present almost complete agreement in their definition of the location of problem areas in the town. These areas are those which have been previously been suggested as being the transitional areas around the core of the town, and the buffer area between the white and non-white areas of Grahamstown. These areas are areas of very low rateable value - the average value per house is less than £500 in terms of the Municipal valuation of property in the town. It was previously suggested that the pocket of low rateable values (with an average of less than £500) at the left-hand middle edge of the map was not a transitional area, and was probably the result of a peculiar historical accident. Maps No. 9 and 10 do not really pin-point this area as a problem area, and this further strengthens the suggestion that this area should not be regarded as transitional in

character.

4. Housing Density:

The density of houses per acre is the last index used for the preliminary determination of the various ecological zones and natural areas in Grahamstown. Map No. 11 is an isometric map showing the density of houses per acre, calculated from data obtained from the Municipal Valuation Roll for the town. The map is a generalised one, in the sense that minor small fluctuations are not shown because the scale used does not allow any great detail. This is, however, all to the good, as we are only interested in the over-all pattern of housing density in Grahamstown. This over-all pattern is a clear one: the high density areas are situated around the core of the town, and the low density areas are on the periphery. This pattern is the usual pattern for towns and cities in the western world.

Examining Map No. 11 more closely, we find that the higher density areas, bounded by the isometric line indicating a density of 6 or more houses to the acre, are in fact the areas which we have previously described as the obsolete, transitional areas around the central business core of the town, and the buffer zone between the white and non-white areas of Grahamstown. Too, the areas revealed by this map as the highest density areas in the town tend fairly closely to be the most serious problem areas in terms of Maps 9 and 10. Correspondingly, the lowest density areas as revealed by this map are the same areas which are revealed by the previous maps as high rateable value areas, residential in character, and almost or entirely free from signs of disorganisation in terms of the indices used. Map No. 11

clearly reveals distinct density zones, and these zones correspond closely with the zones defined by Maps 6 - 10.

The conclusions of this chapter have been mapped on Map No. 12, which shows the results of our preliminary delineation of ecological zones in the town. The four criteria used - land use, rateable value of houses, indices of social disorganisation, and housing density - were all based on complete counts, and not samples. These criteria present a consistent pattern, which agrees remarkably well from map to map, so that Map 12 merely presents the combined picture presented by Maps 6 - 11. Around the commercial centre of the town there is a transitional zone of mixed land uses, obsolete and blighted houses packed closely together, and containing a population with noticeable features of social disorganisation. This zone may be broken up into three areas - the Kowie-Chapel Street area immediately adjoining the southern and eastern part of the commercial core of Grahamstown; the Settlers' Hill area stretching to the south some little distance from the centre; and the New Street area immediately behind and to the north of the centre of the town. In addition, there is a high density area north of the station, which in terms of density is really part of this transitional zone, but which in terms of rateable value, and social disorganisation does not appear to be part of the zone - we may at this stage consider this area as perhaps being marginal to the transitional zone, and await further analysis to reveal its nature.

Along the border between the white and non-white areas of the town there is an interstitial or buffer zone.

Most of this buffer zone is thinly inhabited, and consists of the industrial area east of the station, cemetries, waste land, market gardens, a minor industrial area at the right top corner of the map, and low rateable value, obsolete houses situated on small plots. This zone tends to exhibit signs of social disorganisation too.

As one proceeds from the centre of the town, past the encircling transitional zone, one encounters a largely residential zone, containing the educational institutions in the town, and then finally the purely residential areas on the high ground around the town, consisting of new or relatively new, high rateable value, low density houses. This zone exhibits no sign of social disorganisation.

A low rateable value pocket at the middle right-hand corner of the map, in the African-South Street area, was revealed. This area does not seem to be a transitional or disorganised area, but is an area of very old, obsolete houses. It is suggested that the area is the result of early settlement, at some distance from the town originally, on land suitable for market gardens. Development has subsequently brought this area into the built-up part of the town. This area would therefore be the result of a historical accident and of topography - the strip of land surrounded by the Kowie streams is still to-day the site of several market gardens.

It is suggested that the zones in the town tend to be concentric. The topography of the town - and the location of barriers to development, such as the municipal forests to the west and south, and the Non-European locations to the east, all limit the develop-

ment of concentric zones, so that sometimes only segments of the zones occur. It seems likely that if development on all sides had been unhampered since the foundation of the town, complete or nearly complete concentric zones would be in evidence to-day.

Map No. 12 thus provides a framework for the analysis and interpretation of data to be presented in the next chapter. A final re-assessment of the ecological structure of Grahamstown, and of the location of zones and areas in the town will be made once all the ecological data gathered for this study have been presented in the next chapter.

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CHAPTER XIV.

THE ECOLOGICAL DISTRIBUTION OF SELECTED DEMOGRAPHIC, AND OTHER SOCIAL PHENOMENA.

This chapter describes and interprets the ecological distribution of demographic material presented in Part II, B above. Additional demographic data (such as for housing) are also given - these data were not presented above, as the analysis is almost entirely ecological, and so would have been out of place in the demographic section of this study. Certain selected non-demographic material, such as data for building heights, and building types, are also presented and analysed in this chapter.

All the data, except those presented in maps 16, and 18 are based on the sample drawn from the European Area of Grahamstown, (described in Appendices G and H.) With a probability sample, the whole problem of sampling error is magnified when ecological analysis is introduced, as the large sample becomes broken up into many small areal samples, and the consequent magnitude of errors is increased. One cannot be sure, without calculating tests of significance, if the differences between data for one area and for another area are likely to be parameter differences, or whether they are merely the result of chance. The Grahamstown sample is, as has been pointed out in the two appendices mentioned above, not a probability sample, but a judgement sample, and therefore we know nothing about the precision of the samples from the various streets in the town. Tests of significance cannot be applied to the data, so that we cannot infer on the basis of statistical probability whether or not differences

between the data for different streets are likely to reflect parameter differences, or not. However, this problem is not as serious as it may at first appear. We are interested in general spatial patterns, and not individual differences between two streets, so that only large differences are of concern to us. It was consequently decided at an early stage in the analysis to map all the available sample data, and see if the pattern presented fitted in with what one would expect on the basis of other ecological studies, and on the basis of the preliminary delineation of ecological zones in Grahamstown (a delineation which did not rely on sample material.) If it was found that the pattern presented was consistent, and agreed with that presented by non-sample data, then it was felt that one could reasonably assume that the pattern presented was a true one, and that an ecological analysis of the sample data was warranted. If however, on the other hand, the pattern presented by the sample data was inconsistent, and did not fit in with the pattern expected on the basis of the ecological distribution of parameters (data based on total counts), it was felt that it would not be safe to proceed with the ecological analysis of the sample data, as sampling errors and bias alone might have produced the confused pattern. Fortunately the results of this mapping of the sample data produced patterns which were both consistent, and which fitted in with the patterns presented by data based on total counts, and with what one would theoretically expect on the basis of existing ecological theories. It was therefore concluded that it was reasonable to assume that the sample data in general revealed actual ecological patterns in the town, and these data are analysed below. The ecological unit used for analysis is the street;

on occasions where long, heterogeneously composed streets are involved, these streets are broken down into small homogeneous units. Thus, as far as possible, homogeneous ecological units are used for the analysis.

1. Non-whites in the White Area of the Town:

Our survey sample from Grahamstown was limited to the official European (white) area of the town. Despite the fact that this area is officially a European area, the sample did contain some Non-European (non-white) households. Of the 989 houses in the sample, 965 were houses inhabited by Europeans, and 24 were inhabited by Non-Europeans, consisting of Coloureds and Indians. Thus, 2.4% of the houses sampled contained non-white persons. The 24 houses contained 25 households, composed of 182 persons. We cannot know the actual number of non-white persons living in independent households in the area, but an estimate of the figure would be about 264 persons (obtained by raising the figure of 182 persons obtained from the 69.11% sample.) This indicates that during 1951-2 the European Area of Grahamstown contained a small but important number of Non-Europeans living in independent households (i.e. other than domestic servants staying with their employees.)

The spatial distribution of the Non-European households in the sample is given in Map No. 13. This map shows that all the cases are concentrated in the transitional zone around the core of the town, defined by Map 12. Within this zone, nearly all the cases are located in the Kowie Street - Chapel Street area. This area has been defined in the previous chapter as a socially disorganised, poor area, with mixed land use, and

obsolete blighted houses. The area is a relatively high density area in the town, and is gradually being invaded by non-residential uses. Warehouses in particular are invading the area (which being sited immediately behind the centre of the town, is an ideal warehouse zone), and during the three years 1951 - 1953 when field-work for the study was in progress, a pottery factory, a new warehouse, and a co-operative's garage and service station were built in the area, thus revealing the process of invasion at work. This is exactly the type of area which American studies of racial segregation would lead one to expect to be a racially intermixed area - this point will be mentioned again in the next chapter, where the ecological pattern finally delineated is discussed, and brief reference made to comparative ecological studies made by other sociologists.

2. Density of the Population Living in Houses:

Our information about the density of the population of Europeans in the European Area of Grahamstown is derived from the sample survey of the area. The mean density of the population, per acre, in each street, was calculated by using an estimate for the total number of persons living in houses in each street (made on the basis of the sample data), and dividing it by the total number of acres the occupied residential plots in each streets amounted to. (These latter data were obtained from the Municipal Valuation Roll for Grahamstown.) The resulting estimates of the population density for the population living in houses havebeen mapped in Map 14.

Examining this map, we find that the highest density areas are located in the transitional zone around the centre

of Grahamstown. In this zone, the density rises from thirty persons per acre to over fifty persons per acre. Most of the areas with a density of twenty or more persons per acre fall within either the transitional zone around the centre, or the buffer zone between the European Area and the Non-European locations. The over-all pattern is thus for the transitional and interstitial zones in the town to be zones of the highest density in the town. Surrounding these dense areas, there is an intermediate zone of lower density, with ten to nineteen persons per acre, and finally the areas furthest from the centre of the town are the low density areas, with less than ten persons per acre. The zones are roughly concentric around the centre (except for the interstitial buffer zone along the locations), and tend to form a gradient, so that density declines as one proceeds from the centre outwards.

3. The Spatial Distribution of Rented Houses:

In the sample of 965 houses occupied by Europeans in the European Area of Grahamstown, 384 or 39.79% (two-fifths) of the houses were rented, while the remaining houses were either already owned, or were being bought by the occupiers. The spatial distribution of rented houses is shown in Map No. 15 in the atlas. Comparing the distribution of rented houses with Map 12, it will be seen that transitional zone around the centre of Grahamstown has the highest concentration of rented houses. This area is a disorganised one, and from Map 15 is seen as an area with a lower degree of home ownership. Examining the map closely, it will

be seen that the buffer zone is also an area with a sprinkling of rented houses. At first sight it appears as if there are relatively few rented houses in the zone, but it must be borne in mind that the housing density is sparse in parts of the zone, so that the incidence of rented houses is higher in this zone than it would at first appear. The zone contiguous to the transitional zone around the centre of the town, is a zone sprinkled with rented houses, while the segment of the zone with highest rateable value (£2,500+) found at the northern periphery of the town, is a zone of almost complete home ownership. The pattern is thus for home ownership to be positively associated with rateable value, low building and population density, and to be negatively associated with obsolescence and blight, and areas of mixed land use and mixed racial groups. The socially disorganised, slum areas of the town are the areas with the greatest concentration of rented houses - i.e. to be areas where the owners of the houses have migrated out, and let their property to poorer groups invading the area. Thus, Settlers' Hill was once a good residential area of the town, and was occupied, as its name suggests, by the early settlers; to-day the area is a blighted area, and this process has occurred equally in other parts of the transitional zone around the centre of Grahamstown.

4. Types of Houses in the European Area of the Town:

In the photographic appendix, space is devoted to portraying the various types of houses in Grahamstown, and the photographs on pages 31, and 79 - 85 give a very good idea of the different types of houses in the town.

When glancing at these different types of houses, the question arises whether or not certain areas of the town are characterised by certain types of houses. It was decided to study the question, and in order to simplify the study, the distribution of three major house-types only was investigated. These were as follows:

TYPE A - The earliest type of houses extant in the town

TYPE B - An early type of house, closely related to type A, but more elaborately developed.

TYPE C - Modern, newly built houses.

These three types were chosen, as out of the many types of houses in Grahamstown, they were the most distinct and easily identifiable types of houses. They yield information about the oldest, obsolete parts of the town, and the newest, developing areas of the town, and this knowledge is valuable from an ecological point of view in studying the dynamics of changing areas.

Type A is well typified by Photographs No. XXXIII and XXXIV, page 31, and No. CVI, page 83 in the Photographic Appendix. This type of house is clearly visible in views of early Grahamstown - see pages 15 (especially No. XVIII) and 17 in the appendix. This type of house undoubtedly dates from the early days of the town. Where this type of house is still found to-day, its presence marks old parts of the town which have not been rebuilt.

Type B is a house closely related to Type A, but a little more recent in time, apparently being an offshoot of the style evinced by Type A. Essentially this type of house is Type A with a verandah added, and its appearance in the town marked the somewhat later, more affluent days of the town which followed the earliest days of establishment and growth. This type of house is

well portrayed in Photographs No. CIII, page 81; CIX, page 83, and CXVI, page 85. Together with type A, this type of house marks the old, as yet not rebuilt, parts of the town. With Type A, Type B provided a very useful and significant index of the location of obsolete parts of Grahamstown.

Finally, Type C is a house which is at the other end of the chronological scale. Unmistakeable in its newness, its presence marks the new areas of the town, where expansion is occurring. Photographs LXLIX, and CI, page 80, for instance provide an idea of this type of house. This class of house provides a very useful contrast to Types A and B.

A field survey of the area was undertaken by the investigator, and the distribution of the three types of houses mapped. Map No. 16 in the atlas gives the results of this survey. Examining this map, it will be seen that new houses in the town (Type C) are located almost entirely on the fringes of the European Area of the town, where outward expansion is taking place: this is what one would expect. To the north side of the town, most of the new houses are located in the highest rateable value, low density peripheral zone defined by Map 12. This area is situated on higher ground overlooking the town, and is characterised by new, expensive houses - the distance from the business centre of the town is great enough to make a car a necessity (as Grahamstown has no public transport), and the area is being settled by the upper class in the town. Little housing development is occurring on the western fringe of the town, as municipal forests block expansion. This is also true to an extent of the southern part of

the area, although it has been possible for some development to occur. Most of the ground here, except in the south-eastern corner, is also high ground overlooking the town. This area is, as Map 12 shows, of lower rateable value, and the new houses in this part of the town are more modest in character than those on the northern side of the town. The reason for this is probably the fact that the obsolescent parts of the town practically adjoin these new houses. On the eastern and north-eastern side of the town, no development has occurred, as the Non-European locations form a barrier to expansion.

The centre of Grahamstown is the oldest part of the town, and no rebuilding of a residential nature has taken place there. The maximum concentration of the oldest type of house (Type A) occurs in the Kowie Street - Chapel Street area, to the east and south of the centre of the town. This area is the oldest residential part of the town, and is the most obsolescent and blighted. This explains why this area often appears as a distinctive part of the transitional zone around the business core of the town. The area is the racially intermixed area (Map 13) of high building and population density, and of low rateable value. As a definite slum area in the town, this area is socially disorganised (Maps 9 and 10) and as has been pointed out before, is being invaded by non-residential land uses; the area is one of absentee owners.

The remaining parts of the transitional zone around the centre, and the buffer zone along the borders of the Non-European locations contained some of the oldest houses, but are mainly characterised by Type B of house. Examining Map 16 there can be no doubt that these areas

are old parts of the town, though not quite as old as the Kowie - Chapel street area. Outside the transitional zone around the centre of the town, in the intermediate rateable value and density zone, a fair number of old houses of Type B are dispersed. Again the pattern is for only the northern periphery of the town to be a new zone with practically none of the Type A or B houses, and the southern part of the town to have been built-up sooner in the history of the town. Thus, the highest rateable values have been found only on the northern periphery, and to be absent from the southern periphery of the town. (Map 8.)

To sum up, Map 16 highlights the transitional zone anound the centre of the town, and the buffer zone between the white and non-white areas as as areas with a large proportion of old houses, obsolete in character, and frequently blighted. The intermediate zone beyond the central transitional zone contains old houses, but not in as great a concentration. Finally, it is only the newest, high rateable value belt on the northern periphery of the town which is almost entirely free of old houses. The distribution of the three types of houses in the town thus further underlines our preliminary delineation of ecological zones in Grahamstown.

5. <u>The Location of 'Shared Houses' in the Area</u>:

A "shared house" is a house where more than one household occupied the house. Map No. 17 shows the distribution of cases of shared houses sampled from the European Area of Grahamstown. The vast majority of shared houses are located in the transitional zone around the central business district. (See Map 12.)

The main area of concentration seems to be the Settlers' Hill area, and not the racially intermixed Kowie-Chapel street area. The reason for this is probably because most of the houses in the latter area are very small, so that it would be almost impossible to share a house, whereas in the Settlers' Hill area, there are more large houses, often double-storied dwellings, which lend themselves to being shared. We may conclude from the map that it is mainly in the poorer, old areas of the town where subdivision of houses occurs. As the shared houses are Grahamstown's small town equivalent of the tenement houses of the large cities, this is what one would expect. (See page 321 below.)

6. The Distribution of Building Heights in the Town:

Map No. 18 is the result of a survey of building heights in the town, undertaken by the investigator. Only buildings with two or more storeys are shown on the map. Examining first of all non-residential buildings, we find that apart from the central business district, almost all the other two or more storey buildings in the town are owned by the educational institutions of the town. These tend to be located in a semi-circle around the centre of the town, in the intermediate zone around the transitional zone adjoining the central business district. (See Map 12.) The fact that there are no buildings in the town of more than three storeys, and the fact that in the central business district there are only two buildings of more than two storeys, indicates the lack of competitive demand for space in the town. The small town nature of Grahamstown is again stressed by this pattern.

The distribution of double storey houses in the

town is interesting: With very few exceptions, they are all located either in the transitional zone around the central business district, or in the new, high rateable value zone on the northern periphery of the town. The double-storey houses in the transitional zone are very largely Type B houses mentioned in section 4 above, and so are old houses built by the early inhabitants of the town during the last century. During the intervening years practically no double storey houses were built, and it is only within the last few years that they have come into favour again, so that a number of modern double storey houses are now being built in the newer, northern part of the town. This would again appear to be an index of the low level of competition for land in Grahamstown. The competition for sites, and land values are such that relatively few buildings are taller than the minimum possible, and this lowest level of building apparently yields returns sufficient to cover ground charges. This is probably a characteristic of all small towns in South Africa, and elsewhere in the western world.

7. Selected Occupational Groups:

Occupation provides a useful index of the socio-economic class status of individuals, so that a study of the ecological distribution of occupational groups provides an excellent index for the delineation of social class areas in the town.

The ratio of non-manual to manual occupations amongst the males sampled from the European Area of Grahamstown was calculated for each street, and mapped. A map of these results is not given in the atlas, as it is possible to describe effectively the patterns evinced.

It is obvious from the map that a degree of segregation of occupational - and so of social class - groups is occurring in the town. Most of the areas where no manual workers occurred in the sample are located on the periphery of the town, particularly on the northern side of the town. With only one or two small exceptions, all areas with a ratio of 2.00 or more non-manual workers in the sample to 1 manual worker occur in the intermediate zone beyond the transitional zone, and the peripheral zone of the town - and not in the transitional zone itself. By contrast, the transitional zone around the core of the town, and the interstitial buffer zone along the boundary of the Non-European locations have a low ratio of non-manual to manual workers: (Less than one non-manual worker to one manual worker in the sample.) It is only in these two zones that streets occur where no non-manual workers were found in the sample - i.e. all the workers were manual, and the over-all picture is generally for a predominance of manual workers in these two zones. The pattern is thus for the manual workers to tend to concentrate in the transitional zone around the central business district of the town, and in the interstitial buffer zone bordering on the non-white locations. On the other hand the non-manual workers tend to concentrate on the peripheries of the town, furthest from the central business district. Segregation of the two broad classes of occupational groups is thus most marked near the centre of the town and on the fringes of the town. In the intermediate zones of the town between the centre and the periphery intermingling occurs, with the trend being towards a gradient ranging from a very low non-manual:manual ratio

at the centre of the town, gradually increasing as one progresses outwards, till one reaches a high ratio, often reaching infinity, on the periphery of the town. It would be possible to give a quantative description of this segregation pattern, but as we are only interested in broad ecological patterns, and not in an intensive ecological study of Grahamstown, this would be beyond the scope of the study. The next chapter makes some references to possible quantative analyses.

A more detailed study of the ecological distribution of occupational groups in the sample from Grahamstown was also made. Again the results can be presented without the need to give a map. The lowest level workers in the socio-economic scale - the unskilled and semi-skilled manual workers - were segregated almost completely within the Kowie - Chapel streets, and Settlers' Hill areas. Thus, they tended to concentrate in the transitional zone around the centre of the town. As one would expect, therefore, the lowest levels in the socio-economic class structure of the town were segregated in the obsolete, blighted areas of the town. These are areas of low rateable value, high population and building density, social disorganisation, and absentee landlords. In the competition for housing and land, these occupational groups with the least economic power had to gravitate to the least desireable areas of the town. For like reason, the buffer zone along the Non-European locations also contained a concentration of semi-skilled and unskilled labourers. Conversely, the workers at the other end of the socio-economic class hierarchy - the professional and higher administrative workers - have as their habitat

the desireable high rateable value, low density areas on the high ground surrounding the town on the northern, western and south-western fringes of the town. As the newer, developing area, the northern peripheral zone of the town contains most of the professional and higher administrative workers in the sample. It is interesting to note that some cases of workers in these occupational categories are concentrated in modernised settler type houses (Types A and B mentioned above in section 4, or similar types of houses) near Rhodes University, and adjoining the central business district of the town (Somerset Street, and the western end of High Street), near the Training College (Grey Street and the western end of Beaufort Street, etc.), and the southern end of Hill street. All these areas either abut onto the central business district of the town, or the transitional zone. The process here seems to be both that of the desireability of being near the University and the Training College - and as there is practically no new building sites in these areas, the only alternative is to renovate old houses - and of being near the central business district - as Grahamstown has practically no flats, and certainly at the time of the fieldwork, had no luxury flats in or near the centre of the town, again the only alternative if one wished to be near the centre was to renovate old houses. The pattern seemed to be that houses in areas fringing on the University and Training College were being invaded by professional workers, and consequently old houses built during the last century were being externally restored, and internally modernised. A certain snob value was also not entirely absent from these houses, and certainly more than one

owner in this area revealed in conversation that he was proud to be living in a house that was already in existence at this or that important historical event in the town's history! Thus, obsolescence does not necessarily involve blight, but only does so once the area has become unattractive for one or more reasons to the middle and upper income groups, who then are succeeded by the lower income groups renting the houses from absentee landlords. If an area is attractive to the upper income groups, then renovation and modernisation of the buildings will be found, and decay and deterioration will not be evident. It is suggested, therefore, that in the areas immediately adjoining the University and Training College, and the centre of the town near the University, a process of invasion by upper income groups is occurring, and that old areas are thus being renovated. The houses involved are all large houses, indicating that the areas were once good residential areas in the earlier days of the town, and the process of blight does not seem to have reached these areas. This process of invasion is probably only occurring on a limited scale, but one can be sure that if it were not occurring, then the obsolete houses would by now be blighted, or would soon become so.

8. <u>The Spatial Distribution of Afrikaans-speaking Households</u>:

Grahamstown is a predominantly English-speaking town, and the only language group in the town which is of any importance, apart from the English-speaking group, is the Afrikaans-speaking group of persons. (See page 232 above.) The ecological distribution of the Afrikaans-speaking households in the sample from the European Area of the town is portrayed by Map No. 19.

Comparing the distribution of the Afrikaans-speaking households with Map No. 12, it will be seen that the transitional zone around the business centre of the town accounts for most of the Afrikaans-speaking households in the sample. The buffer zone between the European and Non-European areas also contains some households, while the remaining Afrikaans-speaking households are located in the intermediate zone around the transitional zone - particularly on the south side of the town. It is very noticeable that the low density, high rateable value area on the northern periphery of the town contains only one of the households in the sample of Afrikaans-speaking households, so that by inference this zone is almost entirely devoid of Afrikaans-speaking households. Map No. 19 shows a process of segregation at work. The Afrikaans-speaking households are segregated in the poorest and poor areas of the town, and are almost completely absent from the newest, most expensive areas. It would seem that the more well-to-do of the Afrikaners in the town have chosen the high ground on the south side of the town. The view is good, and the density of housing low, while the value of the houses - as measured by rateable value - is moderate. This southern periphery of the town may be described as a cheaper counterpart of the new, northern periphery of the town, which is also located on high ground, with good views.

The over-all picture presented by the map is therefore of a poorer group located largely in the transitional zone around the centre of the town, and to an extent on the southern periphery of the town. The Afrikaans in Grahamstown tend to be segregated into the high density,

low rateable value areas of obsolete houses, and absentee landlords. The areas are those inhabited by manual workers for the most part, and in the case of the transitional zone, exhibiting signs of social disorganisation. On the basis of South African experience generally, it is likely that most of these Afrikaners are poorly educated migrants from the "platteland" (the rural areas of the Union) who have been driven into the town by farming failures. This would explain their concentration in the least desireable areas of the town, as they would not be in a position to compete effectively, for space, with the established urban dweller, trained for urban occupations.

9. Spatial Variation of Selected Sample Vital Statistics:

A study was made of the ecological distribution of sex-ratios in the sample, but it appeared that the distribution was random. Likewise, an analysis of the distribution of the ages of the sample was undertaken, and in this instance, clear ecological patterns were discerned. The median age, calculated for the sample population from each street, or part of a street, is portrayed in Map No. 20. Examining this map, it will be seen that the ecological pattern, while it is not as distinct as the pattern presented by other phenomena, is nevertheless clear. The youngest populations, aged less than a median age of 20 years, are all located in the transitional zone around the central business district of Grahamstown, the buffer zone between the European area and the Non-European locations, except for the Selbourne Road area, which is on the northern periphery of the town. Areas with a median sample age of 20 - 29 years of age tend to be located on the whole in the transitional and buffer zones, and

the southern periphery of the town. With some few exceptions, the oldest sample populations, with a median age of 30 years or more, are located in the intermediate and outer ecological zone of the town, and so to be in the low density, higher rateable value areas. The pattern is thus for median age to be negatively associated with rateable value, and positively associated with socio-economic class status - the areas occupied by the higher socio-economic classes in the town are areas with older populations.

A study was made of the detailed age structure of the various zones in the town. As the results can be described easily, no maps of these results are presented. The distribution of the proportion of children in the sample, aged 0 - 14 years, was clearly selective. The areas with a younger median age were the areas with a higher proportion of children aged 0 - 14 years, and correspondingly the areas with an older median age had relatively less children. As median age was inversely associated with rateable value, this would seem to be an aspect of the well-known fact that the poorer people (who live in low rateable value areas) have more children than the higher socio-economic classes. The distribution of the 20 - 39 years old age group did not seem to present any pattern other than that of random selection, but the 40 - 54 years old age group was definitely selective. The areas with an older median age were areas with a higher proportion of men and women aged 40 - 54 years of age, while the areas with a younger median age had less persons in this age group. Finally, the distribution of the 60+ age group seemed random. Therefore, it seems that the distribution of children, and middle-

aged persons are the main determinants in the spatial variation of median ages.

The distribution of fertility rates in the town tend to show, as one would expect, the same pattern as the distribution of median ages. Fertility rates for the town were estimated by calculating the mean number of live legitimate births per street during the period 1947 - 1951, and dividing by the number of married women aged 15 - 44 years per street, estimated on the basis of our sample survey. Again it is not necessary to present a map showing the data, which can be described quite easily. The pattern is far more variable than that of median age, but the general pattern is clear. The transitional zone of the town tends almost entirely to be an area with fertility rates of 200+ per thousand, per street. The buffer zone presents a confused pattern, so that no general tendency is evident. The intermediate zone around the transitional zone has lower fertility rates than the transitional zone, as also does the periphery of the town. Generally rates of under 200 live legitimate births per thousand married women aged 15 - 44 years are found, and nearly all the streets with rates of less than 100 are found on the periphery. The tendency is thus for the disorganised, obsolete slum areas around the centre of the town to have high fertility rates, and as distance from the centre increases, the areas change more and more to areas inhabited by the upper socio-economic class groups, with lower fertility rates.

The European death rates for each street were similarly

estimated by relating the mean number of deaths per street for the period 1947 - 1951 to the estimated population in each street during 1951 (estimated on the basis of the survey sample.) The average for the whole town was about 10 deaths per thousand, and almost all the areas with a death rate of 15 or more deaths per thousand head of population were located in the transitional zone around the town. The remaining areas of the town exhibited death rates about the average for the town as a whole. Thus, the socially disorganised slums around the central business district of Grahamstown are areas with death rates higher than those for the rest of the town.

During the period 1947 - 51 there were only 27 infant European deaths in the town. In view of this a spot map rather than a map showing infant mortality rates was prepared. This map is not shown in the atlas. Of the 27 cases, 17 occurred within the transitional zone, or the buffer zone in the town, and the other 10 all occurred in the intermediate zone between the transitional zone and the periphery. Of these 10 cases, 9 were located close to the boundaries of the transitional zone as defined by Map No. 12. Thus, the infant deaths were mainly located in the poor, socially disorganised slum and obsolete areas of the town, or in areas adjoining these areas. No infant deaths occurred in the high rateable, upper class areas of the town. Infant deaths thus appear as correlates of poverty, unemployment, neglect, and disability, and bad housing in the town.

A study was made of the distribution, by age, of the various marital groups in the sample. This analysis failed to reveal any markedly selective pattern, so that

no conclusions can be drawn. Whether in fact there is little or no ecological selection involved, or whether the sample failed to reveal selections which were actually occurring, is not known.

10. The Ecological Distribution of Phenomena Concerning Housing and Accommodation:

In this chapter and the previous one data concerning housing in the European Area of Grahamstown have already been presented. In this section further data on housing are given.

(a) The Size of Houses and Dwellings in the Area:

The size of the European occupied houses sampled from the European area of Grahamstown is shown in Table XXIII below:

TABLE XXIII

SIZES OF EUROPEAN OCCUPIED HOUSES SAMPLED IN GRAHAMSTOWN, 1951 - 1952.

No. of Living- and Bedrooms per House	No. of Houses in Sample	%
1	5	0.52
2	36	3.73
3	123	12.75
4	259	26.84
5	283	29.33
6	124	12.85
7	78	8.08
8	30	3.10
9	11	1.14
10+	16	1.66
TOTAL	965	100.00

The average (mean) size of the houses in the Grahamstown sample works out at 4.86 rooms per house, with the modal average about 4 to 5 rooms per house, counting only living rooms and bedrooms.

These houses listed above sometimes contained more than one dwelling. A dwelling was defined as a "structure or portion of a structure occupied by a household" where a household was defined as a "person or group of persons whose domestic economy is governed by one single household budget." As usually one house contained only one household, a house usually contained only one dwelling. A "whole house" is defined as a house which was occupied by only one household, and a "shared house" was a house which was occupied by more than one household.(1) Details for dwellings are given in Table XXIV below:-

TABLE XXIV.

SIZES OF EUROPEAN OCCUPIED DWELLINGS SAMPLED FROM HOUSES IN GRAHAMSTOWN, 1951-2.

Rooms per Dwelling	No. OF DWELLINGS SAMPLED		DWELLINGS IN SHARED HOUSES		DWELLINGS IN WHOLE HOUSES	
	No.	%	No.	%	No.	%
1	17	1.63	12	8.57	5	0.55
2	71	6.80	35	25.00	36	3.98
3	168	16.09	46	32.87	122	13.50
4	286	27.39	31	22.14	255	28.22
5	279	26.73	7	5.00	272	30.09
6	119	11.40	5	3.57	114	12.61
7	68	6.51	2	1.43	66	7.30
8	22	2.11	-	-	22	2.43
9	7	0.67	1	0.71	6	0.66
10+	7	0.67	1	0.71	6	0.66
TOTAL	1,044	100.00	140	100.00	904	100.00

The mean size for the total number of dwellings sampled in the area was 4.51 rooms per dwelling. The dwellings in shared or subdivided houses were a mean size of 3.16 rooms, while the dwellings which consisted

(1) The Durban Housing Survey: Natal Regional Survey Series: Additional Report No. 2: University of Natal Press, Pietermaritzburg, 1952: p. 83.

of whole houses had a mean number of 4.72 rooms per dwelling (i.e. per house.) Thus the average size of the dwellings in subdivided or shared houses was smaller than that for whole houses, by an average of over one room. This seems to indicate that the process of subdivision of a house into more than one dwelling reduces the size of the dwellings below the standard of the whole houses. This can easily be checked by studying the size of the houses which are subdivided. Table XXV below provides data for the sizes of shared houses:-

TABLE XXV.

SIZES OF EUROPEAN OCCUPIED 'SHARED HOUSES' IN THE SAMPLE

No. of Rooms	No. of Houses	%
1	-	-
2	-	-
3	1	1.64
4	4	6.56
5	11	18.03
6	10	16.39
7	12	19.67
8	8	13.12
9	5	8.20
10+	10	16.39
TOTAL	61	100.00

The mean number of rooms per house for the shared houses was 7.00 rooms, which means that while the dwellings in the shared houses have a smaller mean number of rooms per dwelling than do the dwellings which consist of whole houses, it is mainly larger houses in the town which have been shared. The process is thus definitely for larger houses to be subdivided, and for subdivision to reduce the size of the dwelling below the standard found in whole houses. Section 5, page 272 and page 273 above indicates that shared houses are located mainly

in the transitional zone of the town, which is characterised by old, obsolete houses. It is therefore the large houses in this area - probably obsolete houses, often double-storeys, with absentee landlords, - which tend to be subdivided. This is essentially the same process as the development of tenements in the large cities of America and Britain.

The ecological distribution of the mean number of rooms per house per street is shown in Map No. 21, while the mean number of rooms per dwelling per street is shown in Map No. 22. The former map shows the major part of the town has an average of four rooms per house, and that only very few, small areas, have a mean of less than four rooms per house. The general pattern is that only the high rateable value zone on the northern periphery of the town has an average of five or more rooms per house per street. In the newer part of the town therefore, the houses tend on the average to be larger. Map No. 22 shows the effect of the subdivision of houses, as any difference between the two maps is due to the influence of shared houses. We already know from pages 272-3 above that shared houses are located mainly in the transitional zone around the core of the town, and it is in this area where Map 22 differs from Map 21. The transitional zone around the central business district of the town is an area where the mean number of rooms per dwelling is generally less than four rooms per dwelling. This zone therefore is not only a zone of higher building density, but also a zone of reduced living space in terms of the number of rooms per dwelling. The northern

periphery of the town is strikingly shown by Map No. 22 (which uses broader class intervals than Map No. 21) as a distinctive zone in the town with larger dwellings. The characteristics of this zone have been mentioned so frequently in this analysis that it is not necessary to repeat them here. The intermediate zone around the transitional zone is shown by the map to be intermediate in terms of dwelling size - the average of four rooms per dwelling is intermediate between the smaller average for dwellings in the transitional zone, and the larger average for dwellings in the outer zone on the northern part of Grahamstown.

(b) Some Demographic Aspects of Housing in the Area:

Grahamstown had, during the time that the fieldwork for this investigation was being conducted (1951 - 1953), the reputation among the townspeople of being a town where it was very difficult to obtain housing accommodation short of buying or building a house for oneself. For the lower income groups, rented houses were difficult to obtain. Flats were few in number, and there had been only a comparatively limited number of new houses built in the town during the previous ten years or so. The town had no sub-economic or economic housing scheme for Europeans, and many of the houses in the town were obsolete (as can be judged from the number of very old houses in the town shown on Map No. 16.) When interviewed during 1953, the Medical Officer of Health for Grahamstown stated that there were old houses in the town which should have been condemned and pulled down, but they were left standing just because there were no alternative houses for accommodation available. It is important

therefore to investigate some of the demographic aspects of housing in the town. It is expected that as most of the poorer classes of Europeans in Grahamstown cannot afford to buy houses on the open market in the town, and as no new houses for them had been built at all (many of them were living in houses about a century or more old - houses which by modern standards should not have had a useful life of more than about 50 years at the most), that housing maladjustment is a problem in the area which affects the poorer parts of the town. It will be seen below how far this assumption is actually true.

(i) Occupancy of Houses and Dwellings:

The over-all occupancy density in the sample from Grahamstown was 4.08 persons per house, and 3.77 persons per dwelling, counting persons at all ages as one unit. If we define persons aged 10+ years as equal to one adult, and persons under 10 years of age as equal to half an adult,(2) then in terms of equivalent adult-units, the occupancy density per room (using living rooms and bedrooms as a base) for the whole sample is 3.26 equivalent adult-units per house, and 3.02 equivalent adult-units per dwelling, and 0.67 equivalent adult-units per room. A total of 314 dwellings, or 30.08% of the sample of 1,044 households had an occupancy density of 1+ equivalent adult-units per room, and 23 of these (or 2.20% of the sample) had an occupancy ratio of 2+ equivalent adult-units per room.

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(2) See Report No. SS 27, of the Cape Town Survey, issued by the Social Science Department of Cape Town University: Notes on the Concepts and Measurement of Overcrowding. Also see Report No. SS 19: The Concept of Overcrowding, and Report No. SS 26: Measures of Overcrowding. These reports were written by Prof. E. Batson.

These dwellings with a higher than average occupancy density ratio are mapped in Map No. 23 in the atlas. Examining this map, it is obvious that there is a very high concentration of dwellings with an occupancy ratio of 1+ equivalent adult-units per room in the transitional zone around the central business district of the town. The buffer zone also contains such dwellings. Only a few such dwellings are located in the intermediate zone surrounding the transitional zone, and hardly any occur in the high rateable value, upper class area on the northern periphery of the town. Dwellings with an occupancy density ratio higher than that for the sample as a whole are therefore very largely characteristic of the slum and semi-slum poverty areas around the centre of the town. The process of sharing a house has little to do with this phenomenon, as only a fifth of the households involved occurred in shared houses. On the other hand, 41% of the 140 dwellings occurring in shared houses had an occupancy density of 1+ equivalent adult-units per room, as against only 15% of the 904 dwellings occurring in whole houses. Thus higher occupancy density is associated with the subdivision of houses, but as the number of subdivided houses is not large, this contributes little to the total incidence of dwellings with a higher occupancy density.

(ii) Household Size:

The obvious question which follows on the above discussion of the transitional zone of the town having a higher occupancy density ratio, is of how far this is due to larger families in the area, or perhaps rather of larger households, and how far due to smaller houses. Whatever the reason, it is obvious that the households

in this area tend to be more crowded than elsewhere.

In Table XXVI below the distribution of household sizes in the sample is given:

TABLE XXVI.

DISTRIBUTION OF HOUSEHOLD SIZES IN THE SAMPLE POPULATION

No. of Persons in Household	No. of Households	%
1	61	5.8
2	228	21.8
3	235	22.6
4	234	22.5
5	133	12.7
6	64	6.1
7	41	3.9
8	17	1.6
9	19	1.8
10	2	0.2
11	6	0.6
12	3	0.3
13	-	-
14	-	-
15	1	0.1
TOTAL	1,044	100.0

The mean household size for the sample of Europeans from Grahamstown worked out at 3.8, or almost four persons, per household.

The mean size for the sample of households from each street was calculated, and the data mapped. The pattern presented by this analysis was for almost all streets in the transitional zone around the central business district, and in the interstitial buffer zone along the boundaries of the Non-European locations, to have a mean household size of four or more persons (often a mean household size of five or more persons was encountered in these areas.) The intermediate zone tended to have an average household size of between three and four persons, which is about the average level for the sample as a whole. The high rateable value, northern peripheral

zone was almost entirely a zone with streets having a mean household size of only three persons. Indeed, the £1,500+ contour line on the rateable value map (No. 8) describes fairly closely the zone with only three or less persons per household, on the average. Just as a portion of this rateable value zone appears at the bottom left-hand corner of the map (i.e. on the high ground on the southern periphery of the town) so too this area has a mean household size of three persons or less. Indeed, pursuing this comparison, it was found that the pattern presented by the contours of the rateable value map could well be boundaries for household size. With hardly any exception the £1,000 or less rateable value contour line bounded the areas with a mean household size of four or more persons, while the areas demarcated as having a rateable value of less than £500 were the areas, with again only a few exceptions, which had a mean household size of up to five or more persons. As one would expect therefore, the poor areas of the town were areas with relatively large households, and the well-to-do upper class areas of the town were areas with relatively small households.

It is thus possible to state that not only are the relatively crowded dwellings which occur in the poorer parts of the town, particularly the transitional zone, the result of a high proportion of small dwellings (Map 22), but also the result of larger households than are found in the other zones of the town. (No map for the size of households is given.)

(iii) Multi-family Households, and Households Containing Boarders, Lodgers, and Relatives:

A household is not necessarily composed solely of

a biological family - i.e. a man, woman, and their dependant children, but can have other relatives, and non-related boarders aggregated thereto. For that matter, a household need not contain a family at all. A study has been made of the composition of households in the Grahamstown sample. For the purpose of the study, relatives were defined as persons related to the head of the household or his wife, other than dependant children. Lodgers were defined as persons outside the biological family who paid for lodging with the household, but did not board as well - lodgers thus composed independent households. Boarders were defined as persons outside the biological family who boarded with the household - they formed part of the household. Lodgers and boarders could consist of relatives or non-relatives. A multi-family household was defined as a household containing more than one biological family. In Map No.24 dwellings containing lodgers, relatives, and multi-family households have been mapped.

Examining Map No. 24, it is clearly evident that the various types of households - households which have taken in lodgers; or boarders; or which have non-paying relatives living as part of the household; and multi-family households, tend very much to concentrate in the same sort of areas. Furthermore, it is obvious that most of the cases are located in the transitional zone around the central business district, and in the buffer zone bordering the Non-European locations. The concentration of cases in these areas is marked. Cases occur in the intermediate zone around the transitional zone, but the concentration is considerably less, while very few cases occur in the well-to-do peripheral zone. There

is thus an association between these types of households, and low rateable value, obsolete areas. It is in fact the poverty areas of the town which are characterised by these households, and not the upper income group areas.

(iv) Dwellings with Inadequate Sleeping Accommodation:

To complete the study of the demographic aspects of housing in the town, a study was made of the provision for sleeping accommodation in the various dwellings in the sample from the European area of the town. The following definitions and standards were applied:

A sex-separation standard requiring that persons of 10+ years of age, of the opposite sex, other than husband and wife, should not share rooms for sleeping purposes; but that one or at the most two children under the age of five years may sleep with their parents, was applied.(3) Where this standard was not met, inadequate sex-separation was said to exist.

A dwelling was said to have overcrowded sleeping accommodation if the sex-separation standard could be met, but only by having more than three equivalent adult-units sleeping in one or more bedrooms respectively.(4) Crowded sleeping accommodation was said to exist if the sex-separation standard was met, but at least one bedroom in the dwelling contained three equivalent adult-units. Satisfactory sleeping accommodation was said to exist if the sex-separation standard was met, and less than three equivalent adult-units were sleeping in a room.

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(3) Durban Housing Survey: op. cit., p. 90, para. 4.

(4) Ibid: para. 5.

In the sample of 1,044 dwellings, 46 dwellings, or 4.41% had inadequate separation of the sexes for sleeping purposes. In eight of these dwellings, a minimum of two extra bedrooms were required in each dwelling if the sexes were to be separated on the basis of crowding three equivalent adult-units into one bedroom. In the remaining 38 dwellings by the same standard at least one extra bedroom per dwelling was required.

Dwellings which had a sex composition which made adequate sex separation possible, but which had overcrowded bedrooms with more than three equivalent adult-units per bedroom, numbered only seven cases. This small number, less than 1% of the sample, was kept small by the fact that the chances of obtaining a household with practically all male or female sex composition were not great. If the sex composition had been more usual, these dwellings would have had inadequate sex separation on account of the density of occupation. Dwellings with adequate sex separation, but with crowded bedrooms - i.e. three equivalent adult-units per bedroom - numbered 32 cases, or 3.07% of the sample. In all therefore there were 53 dwellings which had either inadequate sex separation or overcrowded sleeping accommodation, and these cases formed 5.08% of the sample. A total of 85 dwellings had inadequate sleeping accommodation in terms of crowded or overcrowded bedrooms or inadequate separation of the sexes - i.e. 8.14% or about one-twelfth of the sample.

These 85 cases are located in Map No. 25. It should be borne in mind that the dwellings which failed to meet the sex separation standard fail to meet the requirements of the Union's Slums Act, and so would be officially classed

as slum dwellings.[5] Comparing the map with map No. 12, it will be seen that practically all of the cases with inadequate sex separation are located in the transitional zone around the central business district of Grahamstown, and most of the remaining ones are in the buffer zone. One or two cases occur in the intermediate zone adjacent to the transitional zone, and none occur in the well-to-do peripheral zone. This map therefore yet again points to the transitional zone as the slum zone of the town - the socially disorganised area, with overcrowded houses, inadequate sex separation for sleeping, poverty, unemployment, etc. Overcrowded and crowded sleeping accommodation is found in the same areas, and are a reflection of the same pattern of housing maladjustment. The transitional zone of the town with its obsolete, blighted houses, and larger households with small houses is thus further indicated as the problem zone of the town, whether it is from a social welfare, housing, or general sociological point of view.

(c) Housing Amenities:

A study was made of certain selected amenities, which serve as informative indices of obsolescence, and/or help to delineate class areas in the town. A detailed study of housing amenities is not intended, and the analysis is ecological.

(i) Dwellings without Bathrooms:

Dwellings without a bathroom are dwellings which are deficient in a major amenity, and so are a problem from the point of view of housing amenities. In the sample,

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(5) Durban Housing Survey: op. cit., p. 89.

112 dwellings, or 10.73% of the dwellings sampled had no bathroom. These dwellings were located in 109 houses, or 11.30% of the number of houses in the sample. Map No. 26 in the atlas locates these houses. Comparing this map with map No. 12 it is immediately obvious that with very few exceptions the houses are all located in either the transitional zone around the centre of the town, or in the interstitial buffer zone bordering on the Non-European locations. The transitional zone especially is the zone most affected. The houses involved are all old houses, built before the time when bathrooms came into fashion. Yet again this zone is marked as a problem zone in the town - this time from the point of view of a major housing amenity.

(ii) Dwellings with Coal/Wood Stoves, and Oil Stoves:

Grahamstown is supplied both with gas and electricity, so that generally oil burning stoves, or coal or wood burning stoves other than those of the expensive Aga or Esse type are less preferable to the easier to use, and cleaner, gas or electric stoves. It is safe to assume that probably most of the housewives in Grahamstown would choose a gas or electric stove if they could, and that those who would not are mainly migrants from the rural areas.(6) It is therefore postulated that coal/wood and oil stoves are tending to become obsolete as far as the better residential parts of the town are concerned, so that the concentration of these types of stoves will mark the older, poorer parts of the town, especially where the Afrikaans rural migrants tend to concentrate.

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(6) During 1956 the investigator, working at the National Institute for Personnel Research, undertook a confidential study for a mining corporation of the housing preferences of its workers. Afrikaans migrants preferred coal stoves.

In the sample a total of 223 houses (23.12%) had coal or wood stoves, and 65 dwellings (6.22%) had oil stoves. (The 223 houses with coal/wood stoves formed 21.37% of all dwellings in the sample.) A map of the distribution in space of coal/wood stoves, and of oil stoves was prepared: it is not necessary to present this map. The pattern shown by the distribution of these cases is the same as the pattern presented by Map No. 26. Nearly all of the cases concentrate in the old, obsolete transitional zone around the centre of the town and in the buffer zone, showing that as was postulated on the previous page, these cases occur in the older, poor parts of the town, where the concentration of Afrikaans-speaking people (probably mainly rural migrants) is highest, and where the housing is unmistakeably obsolete in character. As one would expect, the distribution of obsolete amenities thus is the same as the distribution of old houses (Map 16) and absentee landlords (rented houses: Map 15.) These cases mark areas where modernisation has not taken place.

(iii) Dwellings with Telephones:

At the other end of the social scale, the distribution of telephones, which are especially the amenity used by the upper socio-economic class groups, was studied. From the October 1950 Telephone Directory for Port Elizabeth, East London, and Neighbouring Districts, the total number of private houses with telephones in each street was extracted. The relative absence of telephones in an area may be taken to indicate that the area concerned is inhabited by the poorer classes who cannot afford a telephone. The proportion of houses in each street was calculated, and the data mapped.

It is not necessary to present this map, as the pattern is a clear one. The transitional area as a whole is an area where less than two-thirds of the houses contain telephones, and in the Kowie-Chapel Streets area less than one-third of the houses contain telephones. The buffer zone is also a zone where less than two-thirds of the houses contain telephones (most of the streets in the buffer zone contain less than one third of the houses with telephones.) All the rest of the European area, outside of the transitional zone and the buffer zone, with the exception of the south-eastern periphery of the town, have more than two-thirds of the houses with telephones. The boundaries of the transitional zone follow the pattern of Map No. 12 very closely, but the buffer zone at the south-eastern part of the zone seems to extend into the European area as far as York Street, and so link up with the transitional zone. The south-eastern periphery of the town with less than two-thirds of the houses having telephones is the area which for instance was noted in connection with Map No. 19 (see page 279 above.) The lower distribution of telephones supports the contention made on the above page that this area is a poorer counterpart of the northern part of the town. The pattern is thus that the distribution of telephones in the town follow the pattern we would expect on the basis of our previous knowledge of the ecological pattern of the town, and so further confirms the existence of the various zones in the town. The poor, working class areas are areas with few telephones, and conversely the high rateable value, newer upper class zones are areas with a high incidence of telephones.

This concludes the presentation of the ecological distribution of selected data concerning the European area of Grahamstown. It is now possible to determine finally the ecological structure of the town, and to describe some of the characteristics of the various ecological zones and natural areas in the town, and to give some brief idea of ecological processes at work. All this is the contents of the next(and final) chapter on the ecological structure of Grahamstown. We now proceed, without further ado, to this final stage in the ecological analysis of Grahamstown.

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CHAPTER XV.

THE ECOLOGICAL STRUCTURE OF GRAHAMSTOWN, 1951 - 1953.

In the previous two chapters, the spatial distribution within Grahamstown of various social and demographic phenomena has been studied. The presentation has been largely of a general nature, and detailed studies have been avoided. The aim has been to determine only the broad ecological pattern of the town. Consequently, detailed quantitative analyses of specific aspects of the ecological structure of the town, involving for instance the use of the cost utility techniques,(1) or of other statistical techniques, while they would have been most illuminating, have been avoided as being beyond the scope of the present study. The analysis of the ecology of Grahamstown has been concerned with only the European area of the town - which is a comparatively small area, of about three to three-and-a-half square miles in size. The distribution of the following phenomena has been studied: Land use; type of shops in the central business district of the town; rateable value; indices of social disorganisation (maintenance grants; disability grants; Children's Court cases; children in classes for deviates; unemployment); housing density; non-whites living in independent households within the official European (white) residential area of Grahamstown; the density of the population living in houses; rented houses; selected types of houses;

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(1) For a stimulating report on the adaption of the use of cost-utility curves (Lorenz curves), and indices based on the cost-utility method, to ecological analysis, see: P.M. Hauser, O.D. Duncan, and B.D. Duncan: Methods of Urban Analysis: A Summary Report: (AFPTRC-TN-56-1): Air Force Personnel & Training Research Centre: Lackland Air Force Base, San Antonio, Texas: 1956.

shared houses; building heights; selected occupations, and the ratio of non-manual to manual workers; Afrikaans-speaking households; sex-ratios; median age; the 0-14, 20 - 39, 40 - 54, and 60+ age groups of the sample population; fertility rates; death rates; infant deaths; the average number of rooms per house, and per dwelling; the occupancy density per dwelling of the sample population; mean household size; lodgers, boarders, non-paying relatives, and multi-family households; households with inadequate sex-separation for sleeping purposes, and crowded or overcrowded sleeping accommodation; dwellings without bathrooms; dwellings with coal/wood stoves and oil stoves; and finally, telephones. The pattern presented by the spatial distribution of these various phenomena was, except in instances where ecological selection did not appear to be involved, clear and consistent. The preliminary determination of the ecological zones and natural areas in the area, based on parameter (and not sample) distributions of land use, rateable value, indices of social disorganisation, and housing density, was accurate in so far as subsequent spatial distributions of the other phenomena studied agreed with it. After a careful study of the maps used for the study (including maps which are not presented in the atlas) Map No. 27 was drawn. This map presents the ecological zones and natural areas in Grahamstown, as outlined by the various phenomena studied. It will be observed that this map departs little from Map No. 12 which provided a preliminary delineation of the ecological structure of Grahamstown. The only differences are slight - the buffer zone has been made to extend deeper into the European area, and the transitional zone on the eastern side has been extended till it links up with the

buffer zone. The characteristics of the various zones and areas in the town, can now be described as follows by summarising the findings of the previous two chapters:

1. The Central Business District of Grahamstown:

The central business district of Grahamstown is sited on what was originally the camp chosen by Colonel Graham in 1812 as his headquarters on the frontier of the Eastern Cape. The centre of the town to-day is thus situated upon the original nucleus of the town, and has not shifted during the 140 odd years of the town's existence. Topographically the centre is on the elevated tongue of land in the centre of the basin in which the town lies, and is from a geographical point of view the ideal site for a centre of a town - thus the original strategic reasons for the exact choice of the nucleus of Grahamstown are evident in the present-day location of the central business district. The district is largely facade in nature, and occupies part of the two main streets of the town - High Street and Bathurst Street. Immediately behind these streets there is no depth to the concentration of business and commercial uses, which rapidly give way to the mixed land uses of the transitional zone around the centre of the town.

2. The Transitional Zone around the Central Business District:

Surrounding the central business district of Grahamstown, there is located a transitional zone of mixed land uses, and obsolete and blighted housing. In part this zone is sited on the lower-lying ground around the tongue of land on which the centre of the town is located, and is penetrated by various of the Kowie streams. The zone also includes higher ground, particularly to the south,

in the area around Settlers' Hill, which was originally during the last century a good residential area, but which to-day has become obsolete and blighted. This latter area is still largely residential in nature, unlike those areas in the transitional zone which are located nearer to the centre of the town. The transitional zone as a whole is interstitial in the sense that it is located between the central business district, which is expanding, (albeit at a very slow rate of growth) and the main residential areas of the town. Mixed land uses in the zone include, apart from obsolete housing, a few factories and warehouses, several laundries, market gardens, waste land, and playing fields. The zone exhibits signs of social disorganisation, and relative to the rest of the white area of the town contains a high concentration (indeed, most) of the Children's Court cases, cases of children in deviate classes in the town, and cases of unemployment. The zone is marked as a poverty zone by the concentration of cases of persons receiving maintenance grants or disability grants from the government's Social Welfare Department. The mean rateable value per house for the zone is under £500, making it an area of very low rateable value for houses. This is because the houses are obsolete, and often blighted. The density of houses is, relative to the rest of the European area, high with a mean of six or more houses per acre. The population density for the sample of persons living in houses is also higher than in other zones, with most of the streets having twenty or more persons per acre, and some streets having 30 - 50 or more persons per acre.

The transitional zone contains all of the cases in the sample of non-whites living in independent households

within the European (white) area of Grahamstown. The zone also includes the highest concentration of rented houses - i.e. of absentee landlords who live in other zones of the town, or outside of the town. Conversely, the zone has the lowest concentration of cases of home ownership. Most of the oldest type of houses in the town are located in the zone, together with a high concentration of old (Type B) houses. The vast majority of shared houses are also to be found in the zone.

The population of the zone is predominantly manual in occupation, with the unskilled and semi-skilled white workers segregated almost entirely within the Settlers' Hill and Kowie Street - Chapel Street vicinity areas of the zone. Most of the Afrikaans-speaking persons in the sample are also to be found in the zone, and this is what one would expect in view of the general South African experience that to-day most of the Afrikaners in the predominantly English-speaking towns of the country are semi-skilled or unskilled rural Afrikaans-speaking migrants, who gravitate to the manual class residential areas of a town. The population of the zone also tends to be a younger population, with a fertility rate in most streets being 200+. With a death rate in most of the streets being 15+ deaths per thousand, as against 10 per thousand as mean for the whole white population of the town, the zone has a higher death rate than other zones, and over half of the 27 infant deaths occurring the in the town during 1947 - 1951 were located within the zone.

Dwellings in the zone are, in nearly all of the streets, of a mean size of less than four rooms to a dwelling. Occupancy density would seem on the average to be higher, and the mean size of households in the streets is higher

than in other zones. The zone is characterised by a concentration of households containing lodgers, boarders, and non-paying relatives, and by multi-family households. There is also a concentration of households with overcrowded and crowded sleeping accommodation, and inadequate sex-separation for sleeping purposes. From a demographic point of view, the zone is thus a zone marked by a concentration of cases of housing maladjustment. From the point of view of housing amenities the zone is also a problem one, in that it contains a relatively high concentration of dwellings without bathrooms, and dwellings with coal/wood or oil stoves, which are socially obsolete in the town. Finally, in terms of telephones, the zone generally contains streets where less than two-thirds of the houses contain 'phones.

No statistical measures of the characteristics of the population in the transitional zone were prepared, as this would have gone beyond the intended scope of the study. From the above descriptions however, we may deduce that the characteristics of the population segregated into the zone tend to be those of a younger population with a higher fertility rate than is found in other parts of the town. The socio-economic class groups living in the zone are very largely the manual working groups, and most of the unskilled and semi-skilled workers seem to live in the zone. Associated with this is a high concentration of Afrikaans-speaking households, which is what one would expect in view of the experience of predominantly English-speaking South African towns, where the majority of the Afrikaners are unskilled or semi-skilled rural migrants who are segregated into the poorer, transitional zones. Signs of social disorganisation are exhibited by the zone's

population, which contains cases of poverty, unemployment, broken homes, neglect, and delinquency. The populatiin is also racially intermixed - although the intermixture is only on a very small scale - and contains cases of non-whites living in independent households in the zone.

Within the zone it is possible to distinguish four natural areas - the Kowie Street-Chapel Street vicinity; Settlers' Hill; the New Street area; and to the north of the station. The Kowie Street - Chapel Street vicinity is definitely the most disorganised area in the town in terms of the indices of social disorganisation which have been presented, and it is also the main area containing non-whites in independent households. Physically it is the area which is being the most invaded by non-residential land uses serving the central business district, and contains a high concentration of the oldest, obsolete type of houses in the town. The Settlers' Hill area is further from the central business district, and contains a concentration of large houses dating back to the days during the last century when the area was a good residential area in the town. The vast majority of shared houses in the zone are in this area, probably because of the concentration of large houses which lend themselves to subdividing. The houses in the area are more of Type B and tend to be slightly less old than the houses in the Kowie Street-Chapel Street area. Physically the area appears as a slightly better residential area within the transitional zone. The New Street area lies to the north-west of the central business district, and like the Kowie Street-Chapel Street area is just behind the centre of the town. This area is also being subject to the pressure of invasion by non-residential land uses,

but has so far shown less symptoms of social disorganisation than the Kowie-Chapel Streets vicinity. The area is marked mainly by Type B houses, which are old and obsolete, but not the oldest in the town. The area to the north of the station is an interesting one, and has been shown on map 27 as marginal to the transitional zone. It will be noted that Map 12 did not delineate it as part of the transitional zone proper. A study of the various maps in the atlas reveals that the area cannot be described as a disorganised one, or one with very low rateable value, but nevertheless the maps do give the idea that the area is marginal to the transitional zone, and not entirely part of the intermediate zone. The area may be described perhaps as being subject to a lesser degree to the forces of obsolescence, proximity to non-residential land uses, and the centre, (which operate on the transitional zone proper,) which tend to mark it off from the residential intermediate zone.

3. The Buffer Zone between White and Non-white Areas:

The buffer zone between the official white area and the Non-white areas of the town is composed of industry, cemetries, market gardens, waste land, some of the Kowie streams, and some residential land use, (mainly to the north.) Just as the transitional zone is interstitial so this zone is also interstitial, and its characteristics are similar to those of the transitional zone. Physically it is an area of mixed land use, with some tendency for industry to invade the area. It is also an area of low rateable value, obsolete housing. Socially it is a disorganised area, with cases of poverty, unemployment, neglect, broken homes and delinquency. The characteristics

of the population of the zone are similar to those of the transitional zone, so that there is no need to repeat them here. In general, therefore, the area is the same type of ecological area as the transitional zone around the core. Whereas the transitional zone marks the transition from the central business district to the residential areas of the town, with good housing, the buffer zone marks the transition from the white area of the town to the very poor, socially disorganised, and extremely badly housed non-white areas of the town. In both zones the population tends to be one with very low competitive powers which cannot compete effectively with the other social classes for the better residential areas of the town. Socially, demographically, and physically the buffer zone and the transitional zone are interstitial problem zones in the town.

4. The Intermediate Zone around the Transitional Zone:

The intermediate zone of the town has been defined as that zone which is intermediate between the low income group, disorganised transitional zone, and the first-rate residential areas on the periphery of the town. Physically the zone is a predominantly residential one, mixed with educational land uses. The zone has a density of persons living in houses of about 10 - 19 persons per acre. This is a lower density than is found in the transitional zone, but is higher than is found in the peripheral zone. The zone contains a sprinkling of old houses, and of rented houses, but the concentration is markedly less than is found in the transitional zone. The building density is intermediate between the density in the transitional zone and the density on the periphery.

The occupations of the population represent a mingling of manual and non-manual workers, which is again intermediate between the predominantly non-manual character of the peripheral zone, and the predominantly manual character of the population of the transitional zone around the central business district. Afrikaans-speaking households are located in the zone, mainly on the southern side of the town, where it seems that on the higher ground overlooking the town a poorer counterpart of the well-to-do northern periphery is to be found, and it is suggested that the Afrikaners in this area are the economically better off amongst the Afrikaans-speaking households in the town.

Dwellings in the zone are of medium size, being on the average about four rooms in size. The household size is about average for the sample as a whole, and a small number of households containing lodgers, boarders, and non-paying relatives, and dwellings containing more than one family are to be found. Demographically the picture is of a zone with little housing maladjustment, and few cases of inadequate separation of the sexes for sleeping, or of overcrowded or crowded sleeping accommodation are to be found. The incidence of obsolete coal/wood or oil stoves is much lower than in the transitional zone.

The over-all picture of the zone is thus of one which tends to be intermediate between the transitional and the peripheral zone, both in terms of social, demographic, and ecological characteristics. It is possible to distinguish some natural areas within the zone, although these are not nearly as marked as in the transitional zone. The southern part of the zone, on higher ground, seems

to be a less expensive counterpart of the good northern residential areas, and contains more Afrikaans-speaking households than the part of the zone to the north of the centre of the town. The second natural area is the northern part of the zone, which is apparently more English-speaking in character than the southern part, and which physically contains most of the educational institutions in the town, and generally is a more pleasing environment than that in the southern part, at least to a spectator driving through the different parts of the town. However, otherwise there does not seem to be any marked differentiation between the two areas. Finally, mention must be made of the part of the zone on the west side of the centre of the town. These areas contain old houses which have, as has been pointed out, been occupied by professional workers. The area is a desireable zone, being near the centre of the town, the University, and the Teachers' Training College. Old houses have been redecorated, and modernised, so that the pattern is for a relatively well-to-do population to invade the area. This is different from the usual pattern of the lower income groups invading an old area which becomes blighted. In this sense, the area is valuable in underlining the fact that as long as an area has value for the upper income groups - even if it is an old area - then the area will not deteriorate physically, but will only do so when it becomes unattractive to the upper income groups, who then migrate out to areas which they consider more desireable. The blighted areas of a town are always areas which for one or more reasons are not attractive to those who have the money to choose the area in which they wish to live.

5. The Peripheral Zone:

The peripheral zone is the outer residential zone of the town. It is a zone with low building density, low population density relative to other zones in the town, and little or no social disorganisation. The rateable value of the zone is the highest in the town, and home ownership is the general rule. Within the zone, two natural areas can be distinguished - the northern periphery, and the southern periphery of the town. The western periphery of the town is occupied mainly by educational institutions, and the Botanical Gardens, and then the Municipal forests, so that it is not a residential zone, while the eastern periphery falls into the non-white areas of the town, and so constitutes a special case. The northern periphery is located on high ground overlooking the town. The aspect is good, and new expensive houses, with an average rateable value of £2,500+ are to be found. The area is the only one in the town with practically no Type A or B houses (old houses), and with an average of five or more rooms per house or per dwelling. The households are small in size, with an average of three persons per household. The population is an older population, non-manual working in nature, and may be described as the habitat of the professional and higher administrative workers. Afrikaans-speaking households seem to be almost entirely absent. Households containing boarders, lodgers, non-paying relatives, and more than one family are relatively few in number, and housing maladjustment seems to be absent. The southern peripheral zone is really only a fragment in comparison with the northern part of the zone, probably because the presence of forests has limited

expansion on to the high ground above the town. The rateable value of this part of the zone does not go up to £2,000, and the new houses are less elaborate than in the north. Possibly because of its proximity to the obsolete areas of the town, this part is a cheaper counterpart of the northern part of the town, which has been built-up more recently in the history of the town, and is generally newer and further from the old parts of the town, and the centre. (The southern part contains some old houses, indicating that development of this part occurred sooner than the northern part which has practically no old houses.) There are some Afrikaans-speaking households in the southern part of the zone, but on the whole the characteristics of the zone, both northern and southern parts, are reasonably homogeneous, so that differentiation, while being marked, is not extreme.

This concludes a presentation of the characteristics of the various ecological zones in the town which have been delineated by our analysis. Mention must be made of the non-white areas, which constitute another zone, which is characterised by extreme segregation of the races, poverty, social disorganisation and housing maladjustment. Within the zone, the Coloured location (inhabited by persons of mixed white and non-white racial origin), Fingo Village (where freehold rights were granted during the last century to loyal Fingos who assisted during the Kaffir Wars), and Municipal locations, may be distinguished as natural areas containing particular types of population. The location of this zone on the eastern slopes of the basin in which Grahamstown lies, across one of the Kowie streams, was determined historically by the wish of the white population to create a buffer to the eastern approaches of the town -

the approaches most liable to attack from the Kaffirs. (It is from this side of the town that the Natives attacked Grahamstown in 1819.) The Natives and Coloureds in the town were segregated into this zone, which owes its racial character not to the forces of free competition, but of white coercion.

Finally note must be made of the pocket occurring at the west end of the town (the mid left-hand corner of the map.) This pocket has not emerged as a major problem area, but is a pocket of old, obsolete houses and lower income group workers. As some of the streets in this pocket were not sampled in the survey, it is difficult to form a definite picture about the demographic characteristics of the population living in the area, but from visiting the area it seems that it is mainly occupied by manual workers. The pocket seems to be historically the result of topography, in so far as market gardeners settled on a strip of land which was relatively flat, and could be easily irrigated from the Kowie streams threading through it. To-day the area still contains market gardens, but expansion of the town has brought the area within the built-up area of the town, where it constitutes an obsolete but still useful part of the town.

Topography does not seem to have played a major role in the ecological structure and pattern of Grahamstown. Historically, topography was responsible for determining the site of the nucleus centre of the town, the site of the official non-white areas (situated across one of the Kowie streams on the more open, gently sloping eastern approaches to the town), and of the pocket of obsolete houses and market gardens noted in the above paragraph. It is true too that the upper income areas of

the town are situated on high ground surrounding the town, but here topography can only be a contributing factor, in that the peripheral areas of a town tend generally to contain the best residential areas of the town, and in the case of Grahamstown expansion inevitably made the higher ground fall into the peripheral zone. Land use has been influenced to a certain extent by topography, notably in the location of open space uses along the banks of the Kowie streams, but generally the conclusion must be that the role of topography in determining the ecological shape of the town has been secondary. The location of the forests on the south and western sides of the town has limited expansion on those sides, and consequently stimulated exploitation of the open land on the northern side of the town, but apart from this, and the factors mentioned above, there does not seem to be the marked ecological selection along the lines of topography which one finds for instance in a city such as Durban.

A final remark must be made on the development of a "suburban" area at Stone's Hill, three miles out of the town to the south-east on the road to Port Alfred. Stone's Hill is on a ridge overlooking the town, and is probably about 500 feet higher than centre of Grahamstown. Originally the area was apparently an area of retired persons, but during the last couple of years electricity from Grahamstown has been connected up to the area, and several new houses have been built and occupied by persons working in Grahamstown. It is as yet a tiny nucleus of no more than about a dozen houses, but it seems to be showing the possibility of developing into a suburb of Grahamstown. With the siting of the new brickfields adjacent

to the western end of the good residential peripheral zone on the northern side of the town, it is possible that the present development in that area may be curtailed, so that there might be an impetus for Stone's Hill to develop still further. The aspect is excellent, with views of the lower part of Albany, and the distant sea, as well as of inland mountain ranges, and of course, Grahamstown, so that the area might subsequently develop into an important suburb of the town beyond the forest belt surrounding the southern and western part of the town.

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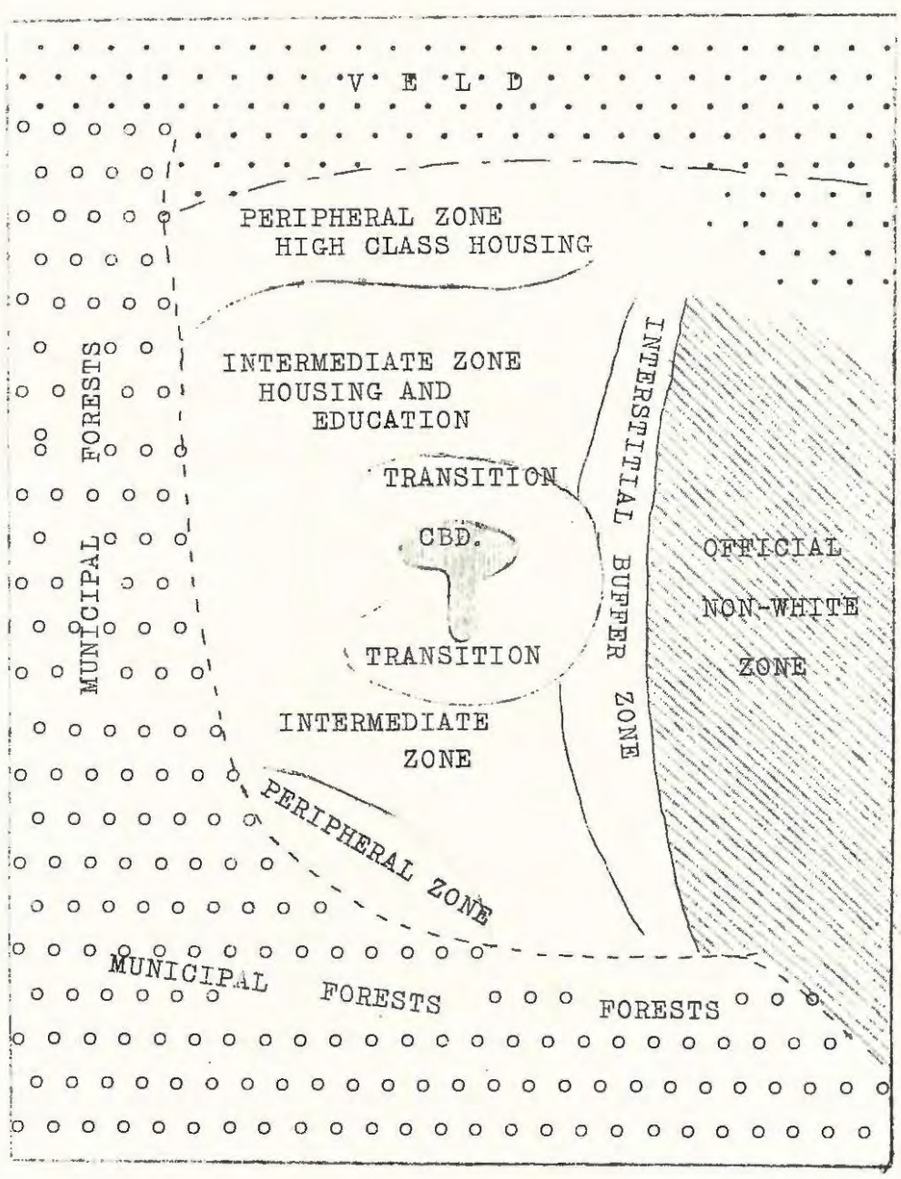
Summing up the ecological analysis of Grahamstown, there are the following ecological zones in the town: the central business district, the transitional zone around the central business district, the official non-white zone in the town, the interstitial buffer zone between the official white and non-white areas, the intermediate zone around the central business district, and finally the peripheral zone on the outskirts of the town. The pattern of these zones is generalised in a diagram over the page. Within the European (white) area of the town the tendency is definitely one for the development of concentric zones, which however have been modified in shape by topographical barriers (such as the forests) and social barriers, (such as the official non-white area.), and the fact that the area covered by the town is not flat. In addition there is also the disturbing factor of the presence of a type of land use which has a certain sentiment attached to it, and which also because of heavy

DIAGRAM No. VII.

GENERALISED DIAGRAM OF THE ECOLOGICAL ZONAL PATTERN OF GRAHAMSTOWN, 1951-3.



CBD. stands for Central Business District
The Transitional Zone is a zone of mixed land uses, and obsolete blighted houses. The population shows signs of social disorganisation.
The Interstitial Buffer Zone is similar in characteristics to the transitional zone.
The Intermediate Zone is a residential zone containing educational institutions. The quality of housing is fair to good, and the population shows little social disorganisation.
The Peripheral Zone is a high class residential area.
The Official Non-white Zone is a very poor, socially disorganised zone, with very bad housing.

capital investments is not easily succeeded by other land uses. Thus the presence of three large schools - a government Boy's High School, a government Girl's School (Preparatory and High School), and a private Girl's School (Preparatory and High School) in the area to the south of High Street between Huntley and Beaufort Streets would explain why the transitional zone around the central business district does not extend into this area to make a more concentric zone. On the whole, however, despite all these disturbing influences, the pattern is one that is easily recogniseable as concentric.

A study was made of the official town plans for Grahamstown. Maps showing the provisions of the Town Planning Scheme, No. 1 of 1948 are not given in the atlas, as a study of the maps, and a comparison of them with the maps prepared for the ecological analysis of Grahamstown revealed that the town plan was really nothing more than a legalisation of the existing land use pattern of the town. This comment covers all that needs to be said about the Town Planning Scheme of Grahamstown.

The ecological analysis of Grahamstown was concerned with the analysis of a comparatively small area. It is interesting to note that within this small area considerable differentiation of ecological areas was evident, so that a distinct ecological pattern could be discerned. While it is not known how small a town must be before ecological differentiation becomes reduced to the simple level of shopping area and residential area only, it is obvious that in an town with about 10,000 whites differentiation is marked, covering a wide range of ecological differences. As this study is intended to be monographic in character, no detailed comparative study of the ecological pattern

of the town is provided, but the reader can check for himself that the ecological pattern of Grahamstown (a small South African town) is substantially along the lines of what one would expect on the basis of American studies of larger towns and cities. Indeed, if the reader pursues the point, he will find that the measure of agreement between American ecological patterns and Grahamstown's pattern is considerable. The similarity between Burgess' theory of concentric zones in a town(2) and of the zones in Grahamstown is the first point which is of interest. The central business district, the transitional zone, the zone of working men's homes, and the residential zone are paralleled in Grahamstown by the centre of the town, the transitional zone, the intermediate zone, and the peripheral zone. The outer commuters' zone suggested by Burgess is not to be found in Grahamstown, and is probably only a feature of large urban units. A unique feature of Grahamstown, and of South African towns generally is the additional large concentration of the non-whites on the outskirts of the town. Whereas the pattern overseas is generally for the poorest section of the total population to be located in or near the transitional zone around the town's centre, the South African pattern is for the poorest section of the population - the non-whites - to be located on the fringes of the town, and to have to travel distances which are often greater than those travelled by any other section of the community. This is the result of legislative decisions on the part of the dominant white group, and produces a paradox which imposes the economic cost and physical strain of long journeys to work on those who

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(2) R.E. Park, E.W. Burgess, R.D. McKenzie: The City: University of Chicago Press, 1925, p. 55.

are least able to afford it.(3) While the study of the ecological pattern of Grahamstown has been limited to a study of the ecological structure of the town, and does not include ecological dynamics - i.e. a discussion of processes at work in the town, it may be stated that all the indications are that as a small and relatively static town, ecological change in Grahamstown is slow, and the processes of invasion, succession, and competition proceed at a much slower rate than in the large, rapidly developing cities. Thus, in Grahamstown, while change is occurring in the transitional zone, the features of blight, decay and social disorganisation are the main characteristics of the zone rather than any "ephemeral or transitory character."(4) Nevertheless, the zone is unmistakeably a static small town's equivalent of the big city's zone of transition, and the same is correspondingly true of the other zones in the town. It is not proposed to describe in detail the characteristics of the various ecological zones of a town which American sociologists have discovered to be true of American towns, but it may be said that generally Grahamstown's zones have characteristics which are substantially similar to those presented by American findings.(5) Similarly in this monographic study it is not necessary to compare the various ecological processes operative in Grahamstown with the description of the processes in ecological literature, but it may be stated that the only major feature peculiar to Grahamstown - and other South African towns - is the production of racial segregation not merely by economic and social pressures but by direct legislation on the part of the white power

(3) Compare this with, for instance, the pattern presented in Black Metropolis: St. Clair Drake and H.R. Cayton: Harcourt Brace, N.Y., 1945: pp. 16 and 206.

(See next page for other footnotes.)

group. Thus the invasion of an area such as Settlers' Hill, which was orginally a good residential area, by the poorer classes and Afrikaans-speaking migrants, and the subdivision of houses is the same as the creation of rooming houses in American cities.(6) Similarly the institutional invasion by non-residential institutions of the transitional zone is again a well-known phenomenon .... and so one could go on. The bibliography at the end of this study will give the reader an opportunity to follow the topic further if he so desires.

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(4) N.P. Gist and L.A. Halbert: Urban Society: Second Edition, Thomas Y. Crowell Co., New York, 1944: p. 141.

(5) See ibid., Chs. VI - IX. Also see bibliography at the end of this study.

(6) Ibid.,pp. 185-6 as an example.

CHAPTER XVI.

SUMMARY AND CONCLUSIONS.

The presentation and analysis of data concerning Grahamstown has now been concluded. A summary of the detailed findings of the study, and of the conclusions reached, are given below. New conclusions are also stated, and hypotheses to be tested by any subsequent studies in the same field are formulated:

1. To-day great cities and metropolitan regions have developed at a rate and to a size completely unparalleled in the history of the world. Much social research has been devoted to studying these large population units, but little is known of the structure and function of small towns. This is especially true in South Africa. The aim of this study was to undertake an analysis of a small South African town with a view to yielding a picture of its development, function, and structure. (p. 1)

2. The study is monographic and intensive in character, and aims at providing an example which it is hoped other researchers will follow and improve upon, so that eventually a body of theoretical and practical knowledge concerning small towns in South Africa may be built up. (pp. 2 - 3.)

3. The definition of small towns which is used is of towns with a population between 4,000 and 40,000 inhabitants. (Further research in South Africa may indicate necessary modifications of this simple definition.) The urban unit chosen for the study was Grahamstown, popularly known as the capital of the Eastern Cape Province. The town was chosen primarily for convenience

sake, as being a University town, student labour could be used for the fieldwork. Too, the development of Grahamstown, involving as it does transition from a phase of rapid expansion to the present phase of stagnation, raised interesting theoretical problems. A study of the town's development may assist our understanding of similar processes in other towns in the Union of South Africa. It is suggested that in many respects Grahamstown is a typical South African town, and so it is hoped that a study of it might cast light upon the dynamics of growth and decline in towns of this scale, and of the functions exercised by many towns of similar structure. Only further research will reveal how far the town is typical generally of small towns in South Africa. (pp. 3 - 4.)

4. The study falls into two parts - a historical section dealing with the siting, development and functions of the town since its foundation in 1812 until the present time, and a section dealing with the regional setting, contemporary functions, and internal demographic and ecological structure of the town. The study of the internal structure of the town is limited to a study of the European (white) population, first of all in order to limit the study to manageable proportions, and secondly because several studies of the non-white populations in the town have already been made. (These studies are still largely unpublished. However see "Journal for Social Research" (published by the Dept. of Education, Arts, and Science, Pretoria), Vol. 6, No. 1, June 1955: James Irving: Household and Relationship Structures in a South African Non-Industrial Urban Area", pp. 5 - 24.)

In South Africa the tendency has been to concentrate largely on studying the non-white populations, so that a contribution to our knowledge of the white population is important. (pp. 4 - 5.)

5. The study is not only monographic, but also heuristic in aim. The purpose is not to test existing hypotheses, but rather to formulate new ones on an ad hoc basis. Such hypothese will have to be tested subsequently by further research into the same field. (p. 5.)

6. A study of the literature in the field of urban sociology was undertaken before choosing the methods to be used for making the study. Studies of town were classified as social anthropological studies (studying social interaction patterns), social survey studies (studying many aspects of the demographic structure of populations), spatial studies of towns (studying the morphology and ecological structure of towns), and town planning studies (specialised types of social surveys.) The present study attempts to combine the types of approaches used by the latter three types of studies: a social survey of the European (white) area of Grahamstown was made; ecological techniques and concepts were used to present an idea of how the town functions in space; and following the lead of some town planning studies, maps, photographs and literary descriptions were used to portray the town as vividly as possible.

7. The major analytical method and theoretical orientation used was that of social ecology. The full potentialities of social ecological techniques and concepts for studying towns do not always seem to have been appreciated outside

of America. Space and the occupancy of space is one of the basic social facts, and in this study this factor is taken to co-ordinate and give meaning to the various phenomena. However, as a pure ecological study without any concern for wider totalities would only give a very partial picture of the town, a demographic analysis of the white population of the town is undertaken as well. Consequently this study has been called a "socio-ecological" study, indicating that wider sociological topics than pure ecology are dealt with. Basicly the study is an attempt to wed the methods and orientation of the social ecologist and the demographer. (pp. 10 - 13.)

8. Space is one co-ordinate used for the analysis. The other co-ordinate used is that of time: space and time are brought together to form a frame of reference, so that in the initial stages of the study a social historical method is used. (See 4 above.) The town since its foundation in 1812 till the present time (1951 - 3) is the subject of this study. (p. 12.)

9. The sociological study of Grahamstown in the past is concerned with the foundation and development of the town, and particularly the socio-economic and ecological reasons for the decline of the town in later years. Due to a paucity of historical studies of the town, most of the analysis is based on data collected from the town's early newspapers, especially the "Graham's Town Journal." This socio-historical study is presented as being essential for understanding the present-day nature, structure, and functions of the town. (pp. 14 - 18.)

10. Following on the 1811-12 campaign, under Colonel

Graham, against the marauding bands of Kaffirs on the eastern frontier of the Cape Colony, Grahamstown was founded in June 1812 as the site of the new military headquarters on the eastern frontier. The site chosen dominated strategically the whole of the Fish River region, which served as the border between the Colony and the interior inhabited by Native tribes. According to a government directive, the site chosen was also suitable for civilian settlement, so that a future town could develop there. The site of the headquarters was officially named "Graham's Town" in recognition of Colonel Graham's services during the 1811-12 military campaign against the Native tribes. (pp. 19 - 27.)

11. A few months after its foundation the camp was made the seat of a deputy landdrost, within the Landdrostry of Uitenhage, and in 1814 a government surveyor surveyed and drew up a plan for the town: (the area covered is the present-day centre of the town, and the original plan for this area is practically unchanged to-day.) The camp was thus by 1820 the military headquarters of the Eastern Cape, and the administrative and legal centre for the surrounding region (the Zuurveld.) It was however still hardly more than a military camp, - a fortified place - and had developed little since its foundation in 1812, and sales of erven to civilians had till that date been rather unsuccessful. (pp. 28 - 37.)

12. The coming of the 1820 Settlers provided the camp with the necessary boost, so that by 1824 the site was unmistakeably a town. The Settlers, shipped out from England to the Zuurveld to act as a buffer against Kaffir inroads were not suited to farming in a wild, insecure

and strange environment, so that eventually the majority of them found their way to the towns, especially Grahamstown as the strategic and administrative centre of the Zuurveld; so that the population of the town grew rapidly. Grahamstown became the supply centre for the surrounding region (which following the settlement was now inhabited by whites) and prospered accordingly. With a new demand for goods, and a new supply of skilled and unskilled labour, trades, commerce and industry developed in the town. Finally, following the peace after the Battle of Grahamstown in 1819, the new settler population of the town, and of the Zuurveld, started a rich barter trade with the Native tribes across the frontier. As the strategic centre on the frontier the town became the centre of this trade, of which ivory and hides were the main commodities secured by the traders in return for beads, scissors, knives, hoes, etc. This trade further stimulated the prosperity of Grahamstown.

13. In 1820 Grahamstown had probably a maximum of about 20 houses. By 1830 it had perhaps 417 houses. During the same period the population grew from about 400 to probably over 3,000. Plans of the town in 1814, 1820, and 1824 show that by 1824 the town was definitely a nucleated town. In fact, by 1830 the town was the commercial centre of the frontier, being the gateway for all trade flowing in and out of the region, and dominated the whole region economically, administratively, and strategically. She was the most rapidly expanding town in the whole of the Eastern Province and seemed set for a dominating and prosperous role in the future. All this was ultimately due to the stimulus provided by the coming

of the 1820 Settlers. Internal migration following external migration into the region had led to a new centralisation and concentration of population, which affected the town most favourably. (pp. 37 - 67.)

14. During the 1840's the process of development and expansion in the town continued apace. Commercial expansion, fostered by the internal needs of the growing and developing region, made the town the emporium of the eastern frontier. Financial institutions - an index of this development - emerged in the town. Now that the town had progressed beyond the mere survival level of existence, cultural, educational, and political aspects of the town's life became important, and the town set the pace for the rest of the Eastern Province. (pp. 68 - 91.)

15. By 1840, the town exercised the following functions: it was the military headquarters on the frontier; the centre of military expenditure; the administrative and judicial centre of the district of Albany (the old Zuurveld); the emporium of the Eastern Province; the gateway to the interior of South Africa; the financial centre on the frontier; the political leader and mouthpiece of the province; the cultural leader on the frontier; the largest and most important town in the Eastern Province; and was in fact known as the "Metropolis of the East" (Eastern Province.) It has been said that it was the most rapidly developing and progressive town in the whole of the Cape Colony. All this was ultimately due to the town's dominant and commanding ecological position in an undeveloped frontier region, to its position of gateway and outpost of civilisation. The ecological

position of Grahamstown in its region, and the ecological and economic structure of the region are the key factors in the development and rapid expansion of early Grahamstown. (pp. 91 - 95.)

16. By about 1840 a turning point in the development of Grahamstown had been reached. With the increasing development of the region there emerged during the following few decades growing signs of competition from other towns for Grahamstown's supreme position. Grahamstown was established, and continued to expand and develop up till the present time, but its rate of growth slowed more and more during the second half of the 19th. century, and relatively it began to decline. This process was one of which the townspeople of the time were well aware, and they tried to stop it first of all by the development of a port at the Kowie (to counteract the growing power of Port Elizabeth as the main port of the province), and by obtaining a main line railway through the town in an effort to stay on the main trade route of the province. However, despite all the efforts of the townspeople, by 1876 the editor of the "Journal" admitted publicly in an editorial that Grahamstown was no longer the important town that it had once been - its trade had dwindled till only the town and its immediate region were concerned, and other towns which had developed in the region (especially Port Elizabeth) had taken over most of the functions of the town. In fact, the editor referred to Grahamstown as a 'kind of "Sleepy Hollow"' rather cut off from the outside world. Thus, in fact about sixty years after its foundation Grahamstown had lost its early character of the "Metropolis of the East" and had become the "City of the Saints." (pp. 96 - 130.)

17. The townspeople of Grahamstown during the last quarter of the 19th. century ascribed the decline in the importance of the town, and the loss of many of its earlier functions, to their failure to compete with other towns which developed in the region subsequently, by failing to develop a good harbour at the Kowie, and by failing to obtain a main line railway through the town. However, the causes for the decline and stagnation of the town went much deeper than such superficial failures. Basicly it is only through an understanding of the reasons for and basis of the town's early prosperity and importance that we can appreciate the causes underlying the town's decline. Fundamentally Grahamstown owed nearly everything to being an outpost of civilisation on the borders of the undeveloped interior - i.e. to the nature of its region and its regional setting. Inevitably the frontier region began to develop, and at first this stimulated Grahamstown - see the effects of the coming of the 1820 Settlers. However, increasing development of the region gradually transformed the region from a frontier region to a developing region further and further behind the actual frontier of civilisation. The ecological organisation of the region changed, and inevitably the position of Grahamstown in the region was altered. The changing nature of the region affected Grahamstown by introducing competition for power and prosperity from towns which previously had not existed. With the development of the harbour at Port Elizabeth, the functions of importation and supply of goods, originally exercised by Grahamstown, were severed, and the function of importation of goods was taken over by Port Elizabeth as the gateway to the new expanded region, and the function of distribution was decentralised to many towns in the region.

The expanding area of the region meant that the frontier moved further and further inland, so that Grahamstown was no longer strategically situated, and the military headquarters and commissariat were moved to towns strategically situated in the developing region. The early frontier trade which gave so much commerce to Grahamstown was essentially a trade in ivory and skins, which dried up as the advance of the white man led to the extermination of the game, and the dispersal of the Native tribes into many towns, and reserves much further inland. No longer the gateway to the interior, but only on one of the routes to the interior (for development had opened up other lines of communication) Grahamstown lost much of its earlier importance as a trade and transportation centre. Port Elizabeth as the new gateway to the province, and the ultimate supply centre for all goods, became the commercial centre - the emporium - of the province. Financial institutions, population, and all the attendant political, cultural, and social importance gradually moved from Grahamstown to the rapidly expanding Port Elizabeth. Grahamstown's functions and importance were largely taken over by Port Elizabeth, the new metropolis of the Eastern Province. So its was in fact that as the region around Grahamstown changed its nature from that of a frontier region undergoing development to that of a developing, settled region, the position of Grahamstown also changed. Initially the region, and Grahamstown's regional location, had made the town the dominant town in the Eastern Province; subsequently the changed region and Grahamstown's now unfavourable regional location ruined the town, and stripped it of most of its importance and earlier functions. Grahamstown founded as

an outpost in an era of pioneering settlement was doomed in a more developed era. Grahamstown enjoyed a few brief years of glory only because it was an outpost strategically situated, but once it was no longer an outpost, it became a backwater. The decline of the town was thus inevitable. The processes affecting both the glory and decline of the town are ultimately inextricably bound up with the socio-ecological processes which were in operation in the Eastern Province from the time of 1812 onwards. This conclusion has possible important theoretical implications for studies of other South African towns, where similar processes may be found to have affected the development of towns which are to-day stagnant, or vice versa. (pp. 131 - 139.)

18. Even at the height of its power during the 19th. century Grahamstown had a good number of schools, and during the third quarter of the century when the commercial importance of the town was beginning to wane, educational institutions which are now well-known were founded. In education the town found a compensatory function to replace commerce, so that to-day the town is known as an educational centre which attracts students from beyond the borders of the Union of South Africa. The more recent function of education has thus preserved the town from complete stagnation and perhaps decay. (pp. 140 - 143.)

19. To-day Grahamstown is a small predominantly English-speaking town with a population which at the time of the 1951 census amounted to almost 24,000 persons, of which almost 9,000 were Europeans (whites.) (The normal term-time white population of the town probably amounts to over 10,000 persons.) The town is situated within the

metropolitan region of Port Elizabeth, a city 83 miles away by road, and with a population in 1951 of over 180,000 persons, of which over 78,000 were whites. It was not possible within the scope of this study to present detailed indices of the metropolitan domination exerted by Port Elizabeth over Grahamstown, but newspapers, specialist medical services, supply of goods and specialised items, and frequency of communications were mentioned as examples of the fact that Grahamstown is within the port's region. (pp. 144 - 158.)

20. Grahamstown is to-day the centre of a wide variety of regional services of an ad hoc type, each function having its appropriate area. The town is a service and supply town for its surrounding region, and it is probably true to say that the modal region defined by its various services corresponds approximately with the area settled by the 1820 Settlers - and to-day, as during the last century, the town is by quite a wide margin the only major town in this region. The districts of Albany, Bathurst, and to a lesser extent, Alexandria would form the outline of this region, with the Fish River still being to-day the northern boundary of the region. Very little of the former commercial importance of the town remains, and apart from dominating a very wide region as an educational centre, and being the seat of the Supreme Court for the Eastern Province, and the headquarters of a large Anglican diocese (functions which all date back to the 19th. century) the town is purely and simply a supply and service centre for the surrounding rural areas. (pp. 158 - 172.)

21. A study of the growth of the town since its foundation

in 1812 provides one of the best indices of the stagnation of the town to-day, and bears out the impressions provided by the historical analysis of the town. From 1819 to 1826 (the period most affected by the 1820 Settlement) the white population of the town doubled about every three years, while from 1826 to 1848 it again doubled in about twenty odd years. From 1850 to 1880 its rate of growth was at the rate of doubling every 60 years or so, while from 1880 till 1951 the white population of the town was growing at the rate of doubling about every 125 years, so that to-day, in terms of growth at least, the town is definitely a static town as far as its white population is concerned. The total population of the town however has been growing at an increasing rate since about 1920, due as far as can be determined mainly to a rapid rate in the growth of the Native population of the town, which has been growing faster than the total Native population of the Union. It is not possible to explain this phenomenon on the basis of data gathered for this study, but several possible causes are suggested, and the factors of differential natural increase, and of migration in and out of the town by the different racial groups need study. (Such a study would probably cast an interesting light on economic trends in the town.) (pp. 175 - 191.)

22. A detailed description of the sample used for obtaining demographic and ecological data for the European population of Grahamstown is given in the appendices. A complete enumeration of the population living in houses was aimed at, but as is explained, due to unforeseen circumstances this was not possible. The resulting sample was unfortunately not a probability sample, so that the precision of the sample was not known. However, both the demographic and ecological

data obtained from this sample presented patterns which fitted in with the patterns obtained from data based on other parameter sources, so that we can assume that the sample obtained was reasonably representative. (At this point it is worthwhile suggesting that any subsequent studies of small towns in the Union should not attempt complete enumerations, and if census data cannot be obtained, should be based on probability samples of a size which allow the fieldwork to be of manageable proportions, and give the investigator a task sufficiently within his resources to allow unforeseen difficulties with field manpower to be easily coped with. It is also suggested that not only the population living in houses, but if possible, the population living in hotels, boarding houses, and hostels should also be sampled, even if this population forms only a small proportion of the town's total pcpulation. (This latter population not living in houses was not investigated in this study of Grahamstown.) Finally, in analysing data based on probability samples with households or dwellings as the sampling unit, it should be borne in mind that while data for the characteristics of dwellings or households may be treated with the ordinary formulae for standard errors and tests of significance, if the sample was a simple random one, any data for the characteristics of the population in these dwellings or households must be treated as being based on a cluster sample when generalising for the whole population of the town.[1] Thus for instance, all the data in this study on ages, sex-ratios, occupations etc. are based on a cluster (non-random) sample. A formula such as that

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(1) Kish, L.: Confidence Intervals for Clustered Samples: American Sociological Review: April 1957, Vol. 22, No. 2, pp. 154 - 165.

given on page 199, footnote 25 applies only to simple random samples where the population can be treated as infinite, and not to cluster samples. According to the article quoted it is a common source of error to apply simple random sample formulae to cluster samples.)

23. A fertility rate was calculated for the European population of the town, based on the sample data, and it appears that the level of fertility in the town is about the same as in the total European urban population of the Union. When the crude death rate for the town was related to the permanent European population in the town, and the shifting population of students and scholars excluded, it seemed that the death rate in the town is somewhat higher than in the European population of the Union as a whole. It is suggested that this is due to the older age structure of the town's population. The town's level of infant health, as measured by infant mortality, seemed about the same as in the European population of the Union generally. The crude rate of natural increase for the town was estimated at 10.1 as against 16.8 for the Union, showing that the rate of natural increase in the town is less than in the Union's European population - probably due to the older age structure of the town's population. A slower rate of natural increase is thus one of the factors operating to retard the growth of town's white population, but the influence of this factor, is almost certainly supported by migration out of the town, in producing the retarded growth of the town. (pp. 191 - 194.)

24. The sample sex-ratio was 0.85 as compared with a figure of 0.97 for the Union's 1946 urban European population.

It is considered that the actual sex-ratio for the permanent core of whites in the town (i.e. excluding the floating student and scholar population) has a sex-ratio even less than this. There seems little doubt that Grahamstown is characterised by a strong bias towards femininity in the population of whites. The reason for this could only be guessed at, but it seems likely the cause is migration out of the town of an excess of males, particularly in the young working age group, and perhaps to a lesser extent a concentration of older spinsters and widows in the town. It is suggested that the static nature of the town means that there are little opportunities for ambitious young men in the town, and being under greater pressure to find a good career than women who often make marriage their career, it is mainly males who are migrating out. (pp. 195 - 198)

25. The sample population exhibits an association between increasing age and increasing femininity of the population. This follows the pattern of the Union's white population, but the association seems more marked in Grahamstown. The migratory processes postulated above could be the cause of this phenomenon. (pp. 198 - 200.)

26. The sample population structure was compared with Sundbärg's models of a progressive, a stationary, and a regressive population. The sample population approximated most closely to the model of a stationary population, and this provides yet another index of the static nature of the town as far as the white population is concerned. (pp. 200 - 201.)

27. Grahamstown's sample age distribution does not approximate to the norm provided by the Union's white population, or to

what one would expect if purely biological and not social forces were operating on the population. The main features of the age-sex distribution are a very noticeable under-representation of the 15 - 39 years old males, and to a lesser extent, of females in the same young working age group; and a over-representation of the 40+ years old age groups. It is suggested that this is the result of selective migration - migration out of the town of persons, especially males, in the young working age groups, and migration into the town of older professional workers and retired persons. (Grahamstown as an educational and legal centre attracts professional men, and is also a town which attracts retired persons.) It is only the pre-working age group (aged 0 - 14 years) which approximates relatively in size with the norm provided by the Union's white population, and this is the group which is probably more affected by biological than social forces in contrast to the older working and post-working age groups. The net result of this is that the sample population - and it is likely also the whole population of whites in Grahamstown - is an older population than the population of all whites in the Union. In particular, the female population of the town seems in contrast to the male population even older than the Union's norm, and this is probably another facet of the femininity of the town, and the greater association in the town between increasing age and increasing femininity. (pp. 202 - 212.)

28. The age-sex marital distribution of the sample population - and it is considered of the total population of the town as well - exhibits certain important departures from the norms provided by the Union's total white population. Never Married (single) males are relatively under-represented

while male and female widowed persons are relatively over-represented. The sex-ratios for the different marital status groups show that only the Never Married group differs noticeably from the Union's norm - the sex-ratio of 0.90 for Grahamstown as against 1.10 for the Union suggests that migration out of the town - if this is occurring, and there seems to be every reason for believing that this is so - is affecting mainly the unmarried male. Thus we may suggest that it is the unmarried male of young working age who is most affected by the need to migrate out of the town to find a good job - and this is what one would in fact expect on the basis of knowing the town from several years residence there. An excess of middle-aged and old spinsters in the town also is responsible for disturbing the sex-ratio of the Never Married group, but it is not known how far this is due to migration into the town of women of this class, and how far due to them being the result of being deprived of mates by migration of young men out of the town in the past. It seems possible that both factors are operating. It is suggested that all these departures from the Union's norms indicate powerful selective forces operating in the town as a result of the static nature of Grahamstown. (pp. 213 - 232.)

29. The town is a predominantly English-speaking town, and in the sample 77.3% of the households spoke English. Nearly all of the remaining households spoke Afrikaans, or a mixture of English and Afrikaans. The town has thus retained the feature, which it acquired from the start of its existence, of being a predominantly English-speaking town. (It is suggested that the majority of the Afrikaans-speaking persons in the town ultimately are

rural migrants, or the children of rural migrants. In this connection, and in connection with the various suggestions above about differential migration into and out of the town occurring, it is evident that any subsequent study of small towns must include a study of migration within its scope. Migration seems a possibly important process affecting the population structure of small towns, and a study of its volume, direction, effects, and causation would be most illuminating.) (pp. 232 - 233.)

30. Grahamstown is a town which is more characterised by the absence than the presence of industry. The potteries and brickfields of the town constitute the only major industry - the clay deposits of the town are said to be excellent, and with quartzite form the only known natural resources which are of commercial importance. Commerce, administration, and education - i.e. non-industrial uses - go to make up the main economic land uses of the town, and so by deduction form the main stay of the town's economy. (pp. 234 - 235.)

31. An occupational classification, based on the Merseyside Survey and the Cape Town Survey classifications was constructured to study the occupational structure of the sample drawn from Grahamstown. (It is likely that the sample under-estimates the proportion of non-manual workers in the white population of the town.) (pp. 235 - 238.)

32. The most recently published occupational data for the European (white) population of the Union is for the 1946 census, and this was used as a norm against

which to compare the sample data for Grahamstown. The census data were reclassified on the same basis as the data for the town, and as the town was an urban area, workers engaged in agriculture were excluded from the Union's data. It was concluded that the European population of the town was both relatively and absolutely a predominantly non-manual population - especially in the instance of the female population. This strongly emphasises the absence of industrial enterprises in the town. The occupational structure of the sample indicated that the main economic activities of the town involved professional, administrative, andcommercial activities, and certain types of personal services. Grahamstown is again revealed as an educational town and an administrative, commercial and service centre for the surrounding rural region. (pp. 238 - 244.)

33. A more detailed breakdown of the occupational structure of Grahamstown indicated that the main features of the town's occupational structure relative to that of the Union appear to be a relative over-representation of professional,administrative, and personal service workers, and retired persons; and a relative under-representation of skilled, unskilled and supervisory manual workers and manual workers in responsible positions. Both male and female populations show this pattern. This again points to the town being a non-industrial town , and a rather static town which attracts retired persons. On the basis of the occupational figures, the commercial activity of the town appears as no more than average - i.e. it approximates to the Union's norm. It is suggested from these conclusions that any migration of young men out of the town would particularly

involve men in the manual working class and not only men in the non-manual occupations. (pp. 244 - 245.)

34. A detailed ecological analysis of the town was undertaken. This analysis was more concerned with the ecological structure of the town, than with ecological dynamics - i.e. ecological processes at work in the town (as this would have involved a study in time and not just at one particular point in time.) A preliminary delineation of ecological zones was made by means of data based on total counts. The land use pattern, municipal rateable value of houses, location of cases of poverty, unemployment, delinquency, and broken homes and neglect, and housing density were used to delineate the ecological zones. (pp. 247 - 259.)

35. The spatial distribution of the following phenomena was then studied: non-whites living in independent households in the official European (white) area of the town; the density of the population living in houses; rented houses; types of houses; shared houses; building heights; ratio of non-manual to manual workers; professional and administrative workers, and semi-skilled and unskilled workers; Afrikaans-speaking households; sex-ratios*; median age; the 0 - 14, 20 - 39*, 40 - 54, and 60+* years old age groups; fertility rates; death rates; infant deaths; mean size of houses in terms of number of rooms; mean size of dwellings in terms of number of rooms; occupancy density of dwellings; mean household size; lodgers, boarders, non-paying relatives, and multi-family households; cases of inadequate sex-separation for sleeping purposes, and of overcrowded or crowded sleeping accommodation; dwellings without bathrooms;

dwellings with coal/wood or oil stoves (which are becoming socially obsolete in the town); and dwellings with telephones. Except in the case of phenomena marked with an asterisk (*) ecological selection was obvious, and the distribution of the various demographic and social phenomena confirmed the preliminary delineation of ecological zones in the town. Only the data for types of houses, building heights, and telephones was completely independent of the sample, but the sample and non-sample data all presented a similar pattern, so that the problem of sampling error when making a detailed ecological analysis did not appear in this case to be serious. (pp. 259 - 300.)

36. In Chapter XV a detailed description of the ecological structure of Grahamstown, based on the analysis of the phenomena mentioned in sections 34 and 35 above, has been given, so that it is not proposed to repeat this description here. Briefly, on the basis of spot maps, choropleth maps, and isometric maps, the following ecological zones in the town were delineated, and the characteristics of each zone described: a central business district, involving two of the main streets in the town, and being of facade development with no depth to the centre; a transitional zone around the centre; an intermediate zone beyond the transitional zone; and a peripheral zone , which due to topographical features has developed mainly on the northern side of the town. In addition, on the eastern side of the town there is located the large official non-white zone, containing most of the non-white population of the town. Between this zone and the official white area there is a buffer, interstitial zone with characteristics similar

to those of the transitional zone, which is a zone of obsolete, blighted houses, and a poor, manual working class population containing a large proportion of Afrikaans-speaking households, and exhibiting some signs of social disorganisation. It seems that the invasion of the transitional zone by non-residential land uses is proceeding very slowly, due to the relatively static nature of Grahamstown. The peripheral zone is a complete contrast to the transitional zone, being a zone of high rateable value, new housing, containing a population of workers high up in the occupational socio-economic scale, predominantly English-speaking in character. The intermediate zone, as its name suggests, was intermediate in characteristics between the peripheral and the transitional zone. (pp. 301 - 317.)

37. The ecological analysis of Grahamstown concerned a relatively small area - the European area of the town itself is probably not more than three to three-and-a-half square miles in extent. Within this small area marked ecological differentiation was found to exist. (We may therefore expect that in towns of Grahamstown's size, with a white population of about 10,000 persons, ecological differentiation will be marked. It would be interesting to discover how small a town must be before ecological differentiation becomes restricted to a shopping district and a relatively homogeneous residential area.) The ecological pattern of Grahamstown will provide a norm against which the ecological pattern of other small South African towns may be compared. (p. 317.)

38. As the study was monographic in character, no comparisons

of the ecological pattern of Grahamstown with the findings of American studies was made, but it was suggested that the pattern of the town followed the pattern of American towns closely. The similarity of the zone structure to Burgess' theory of five concentric zones was pointed out, although the commuters' zone seems to be absent. (It is suggested that it is only in larger towns that this zone will be found.) One marked difference which the Grahamstown pattern showed from American patterns was the presence of a large non-white zone, containing several natural areas, separated from the official white area of the town by an ecological buffer zone similar in character to the transitional zone around the central business district. This zone contains most of the non-white population of the town (which is larger than the white population of the town.) The poorest groups in the town are located on the periphery of the town, and have to bear the cost of longer journeys to work. This is a typical South African pattern, and is the result of legislative decisions on the part of the white power group. (Ecological differentiation within this large non-white zone is not marked.) (pp. 317 - 320.)

To sum up, Grahamstown is a small predominantly English-speaking town, which in the years immediately after its foundation experienced great prosperity and expansion, but from the later part of the 19th. century onwards has become static in nature, with a retarded population growth. This change is due to alterations in the socio-ecological structure of the region around the town. As an outpost in a frontier region the town prospered, but it declined once it became one town among

many in a wider, developing region. Education has replaced commerce as possibly the most important single function of the town, and to-day apart from being a well-known educational centre, Grahamstown is a service and administrative centre for the surrounding rural areas. The region it serves to-day is the region originally settled by the 1820 Settlers. To-day the town is a static town, with a white population that is growing very slowly, and a population (excluding visiting students and scholars) whose age structure is that of a stationary population. A higher death rate, due to the older age of the population, and suggested migration out of the town, especially of unmarried males in the young working age group, seems to be retarding the growth of the white population. The town is a place attracting retired persons, and possibly widows and older spinsters, but does not attract the young and ambitious. Consequently the age-sex-marital structure of the white population departs in some important respects from the norm provided by the total white population of the Union. It is suggested that these departures are the result of, and indices of, powerful selective forces operating on the town - and these forces are thought to be the result of the static nature of the town. The town is not an industrial town, and its white population is mainly composed of non-manual workers. The ecological pattern of the town is markedly differentiated, and follows the pattern of American towns. It is suggested that the absence of a commutors' zone in the town is a feature of all small towns, and in South Africa the peculiar pattern of a large non-white zone located on the periphery of the town will be found generally.

All in all, despite certain important present-day functions, Grahamstown is a static, small town. Its history is inextricably bound up with the history of the development of the region. The present-day structure of the town, both demographically and ecologically, will serve as a norm when studying other towns in South Africa. Ultimately it is hoped that sociologists in South Africa will build up a series of norms concerning small South African towns, and a body of theoretical knowledge which can be tested comparatively against theories developed for other urban units in the world.

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At the beginning of this study it was stated that very little was known about small towns in South Africa. On the basis of this study of Grahamstown it is now possible to formulate tenative hypotheses about the nature of small towns in South Africa, which further studies of the subject can support, disprove, or modify as need be:-

(i) It is postulated that the average small town in the Union is static, and has possibly had a long history of retarded growth, especially as far as its European population is concerned. The age structure of the European population would probably be that of a static population. The fertility rate for the European population may be about the same as the total European population of the Union in English-speaking towns, and somewhat higher than the Union's total fertility rate in predominantly Afrikaans-speaking towns. The death rate will be higher than that for the total white population of South Africa, due to an older age structure in the town. The rate of natural

increase will be lower than in the white population of the Union as a whole. (This may have to be qualified, and stated for English-speaking and Afrikaans-speaking towns separately. It also raises the important question of whether there is any association between the rate of natural increase - i.e. ultimately the age structure of the town, as well as fertility - and size. Is there some point in the size scale at which small towns, even if they are not growing in size, tend to have a higher fertility rate and rate of natural increase more along the lines of the rural areas, so that it is mainly migration which is stopping them from growing?)

(ii) It is postulated that the average small town in South Africa has as its main function that of being a service centre for the surrounding rural areas and villages so that the town is the commercial, administrative, cultural and general service centre for its surrounding region. As a service centre, industrial and manufacturing enterprises would be relatively under-represented, or even absent from the town. The general economic activity of the town would be restricted, so that this would be both an index and a cause of the static nature of the town. The occupational structure of the town would show a predominance of non-manual workers in the white population.

(iii) Perhaps one of the main problems of small towns in South Africa might be this postulated restricted economic activity. One of the results of this would be the postulated inability of the small town to provide adequate opportunities and prospects for most of the young working group in its population, who would then have to migrate out to other larger towns in search of good jobs.

It is postulated therefore that in the average small South African town there is a migration out of the town of whites in the young working age group (say aged 15 - 39 years.) This migration would probably affect mainly the unmarried, especially males, section of the population, and being a migration of the young fertile age group would be a factor in retarding the growth of the town, and keeping it static. It is further postulated that this migration would also affect the non-whites in the town, but perhaps in different degrees from the white population.

(iv) It is postulated that small towns in South Africa contain a relatively larger proportion of retired persons than does the white population of the Union as a whole. These retired persons would have migrated to the town from the surrounding rural areas, and from the larger urban areas of the country. The climatic conditions and siting of an individual town would probably affect the number of retired persons attracted to a town.

(v) Physically, it is suggested, the average small South African town exhibits distinct signsof a lack of demand for land in the centre of the town. The centre of the town will exhibit a thin ribbon development along the main street(s), with a lack of depth and a consequent rapid transition behind the main street(s) of the town. The rate of rebuilding will be slow, and in the residential areas the number of new houses being built will be small in relation to the total number of houses in the town. All ecological processes in the town will proceed slowly, and be spread out over many years.

(vi) It is postulated that the ecological pattern of the average small South African town will be similar to that

of Grahamstown, and consequently much as would be expected on the basis of the generalisation of the American ecologists. It is suggested however that the small of the small towns in South Africa will have ecological patterns less differentiated than that of Grahamstown. It is suggested that except for the smaller towns, a central business district, a transitional zone around this district, an intermediate zone, and a good residential peripheral zone will be present. In addition a large non-white zone on the periphery of the town will be found, separated from the predominantly white area by a buffer zone either of waste land (if the non-white zone is some distance from the white area) or inhabited and similar in character to the transitional zone (i.e. obsolete, and blighted physically and socially.) It must be determined at what point in the size scale ecological differentiation of zones becomes markedly less than occurs in the pattern described above.

(vii) It is postulated that as was the case with Grahamstown many small static towns in South Africa which at some time during their existence showed dynamic growth and development, owe both this phase and the subsequent phase of stagnation to the effect of socio-ecological regional influences operating on the town. It is suggested that in many, though not all, of the cases, the historical development of small towns in this country can be explained in terms of the region around the town, and that regional ecological concepts will prove a very useful analytical tool in studying the development and functions of the towns concerned.

(viii) Finally, it is also postulated that in the case of small towns in this country which are at the moment undergoing

dynamic growth and development, and showing promise of growing beyond the stage of being a small town, or are actually growing beyond this stage, regional ecological concepts will in many cases prove useful in understanding and analysing the causes for this dynamic growth. In this case, the pattern, it is suggested, would be more akin to Grahamstown in its early days, when the region was stimulating the town, and vice versa, and Grahamstown was acquiring new regional functions, and developing in size and importance. It is postulated that the region around a town, in many cases, plays a decisive role in determining the development pattern and trends of the town.

It may be possible to formulate further tenative hypotheses on the basis of the findings of the study, but the ones listed above seem to the investigator to be the main ones suggested by this study. Obviously not all small towns in South Africa are static - some will be growing, and some will be decaying, and special hypotheses will have to be developed for these cases, as the hypotheses above are in many cases shaped by the static nature of Grahamstown. Just how far the hypothesis that most of the small towns in South Africa are static will be true would be interesting to know: South Africa is a developing country, and it would be interesting to know if the small towns of the country are also sharing in this development. At this stage we cannot know how far Grahamstown is or is not a typical South African town, and so how far the findings of this study reflect a general pattern for small towns in the Union. At least the study has presented a picture of one small South African town, and in so doing has suggested the possible outline of other small towns in this country.

Other studies will have to test the hypotheses which have been formulated by this study, and change or discard them as necessary. Too, in addition the definition of a small town should be re-examined, and possibly redefined on the basis of South African experience, for it must be remembered that the definition adopted applied to English conditions, which are not exactly the same as conditions in the Union. Finally, the study has made, it is hoped, some contributions to the study of social ecology in South Africa, and has attempted to use the methods both of the demographer and surveyor, and the social ecologist, in an effort to present a fuller study of a town than either method alone would have produced. As virtually a pioneering study both in the field of the study of small towns, and of social ecology in the Union, it is hoped that this study will prove a guide to further studies in these fields, giving some idea of the problems involved, and of possible hypotheses for further study ....

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APPENDICES.

APPENDIX A.

AN ANALYSIS OF THE GROWTH IN THE NUMBER OF OWNED ERVEN, AND THE NUMBER AND TYPE OF ERVEN OWNERS IN GRAHAMSTOWN, 1814 - 1824.

In this appendix, an attempt is made to analyse material concerning the number of erven owned, and the number and type of erven owners in Grahamstown for the years 1814, 1820 and 1824, with a view to illustrating the expansion which occurred in the town after the arrival of the 1820 Settlers on the eastern frontier of the Cape Colony. The years mentioned are chosen for the reason that it is for these years that the required data are available. The data in the table below are all derived from the lists of erven owners in the town in 1820 and 1824, given on pages 53-4 and 56-7, Volume I above, and from the data supplied in Diagram No. 2, page 31, Volume I above:-

TABLE XXVII

OWNERS OF ERVEN, AND OWNED ERVEN, GRAHAMSTOWN, 1814, 1820 AND 1824.

YEAR	No. OF ERVEN OWNED BY				No. OF ERVEN OWNERS			
	Army Officers	Civil-ians	Govt.	TOTAL	Army Officers	Civil-ians	Govt.	TOTAL
1814	5	8	2	15	4	7	1	12
1820	27	25	6	58	24	21	1	46
1824	31	78	6	115	22	46	1	69

In this table, the number of owned erven and the number of erven owners is shown: they are classified in terms of the three different groups of erven owners distinguished by the original sources - viz. Army Officers,

Civilians, and the Government. Army Officer owners consist of those erven owners who are given a military or medical title to land, including commissioned officers, N.C.O.'s, and army doctors. (No ranks below the level of N.C.O. are shown as owning property.) Civilians are those who are not given any military or medical title. As the former group of owners were in the town as a result of government policy, it is the latter - the civilian group - which will be likely to be a more sensitive index of social and economic changes in the town, and show more clearly the influence of the stimulus afforded the town by the coming of the 1820 Settlers.

From Table XXVIIthe average yearly increase in the number of owned erven over the different periods has been calculated. During the two-year period 1812-14 the number of erven owned rose by an average of 7.50 erven per year; during the six-year period 1814-20 the number of erven owned rose by an average of 7.16 erven per year; while in the four-year period 1820-24, following the coming of the Settlers, the number of erven owned increased by an average of 14.25 erven per year. Thus, up to 1820 the number of erven owned increased by a more or less constant mean number of erven per year, but after 1820, the number of owned erven in the town increased by a larger mean number (about double the number) of erven per year.

By ratioing the number of erven owned to the number of erven owners (given in the table above), it is possible to calculate the mean number of erven per owner in each of the three periods: in 1814 there were an average of 1.25 erven owned by each owner; in 1820 1.26 erven per

owners; and in 1824 1.67 erven per owner. Thus it is only after 1820 that the mean number of erven owned by an owner increased, suggesting that after 1820 the population of the town experienced greater prosperity than before.

Excluding the government from the erven owners, it is calculated that in 1814 Army Officers formed .36 and Civilians .64 of the number of military and civilian erven owners combined (N = 13). In 1820, the proportion of erven owners who were Army Officers had increased to just over one half (0.53) of the non-governmental owners, suggesting that during the period 1814-1820 the civilian population of the town stagnated (which is borne out by impressions conveyed in the chapters on the history of the town.[1]) (N = 52). By 1824 however, the proportion of owners who were civilians had increased to about two-thirds (0.68) showing that after the coming of the settlers the civilian population of the town received a boost. (N = 109).

The mean yearly increase in the number of owned erven in the town between the different periods under review has already been calculated. It is also possible to calculate the mean yearly increase in the number of erven owned by army officers, and civilians respectively. Up to 1814, the number of erven owned by army officers increased by a mean number of 2.50 erven per year, while the figure for erven owned by civilians was 4.00. During the period 1814-20, the number of erven owned by army officers increased by a mean figure of 3.66 erven

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(1) See Volume, p. 37 above.

per year, while the number of civilian-owned erven increased by a mean figure of 2.83 erven per year. Finally during the period 1820-24 the number of erven owned by army officers increased by a mean figure of only 1.00 erven per year, while in contrast the number of civilian-owned erven increased by a mean figure of 13.25 erven per year. Thus, the main fact which concerns us is that after 1820 the average number of erven per year being bought by civilians increased noticeably - about fivefold over the 1814-20 figure. As the increase in the number of erven owned by army officers does not exhibit the same feature, we may conclude that the coming of the 1820 Settlers affected mainly the civilian population of the town in this respect. This is what was expected on the basis of the data given in the chapters on the historical background of the town.

In 1814 there was an average of 1.25 erven per army officer owning erven, and in 1820 1.12 erven. In 1824 the figure was 1.41 erven. Civilian owners had an average of 1.14 erven per owner in 1814; 1.19 erven per owner in 1820, and 1.70 erven per owner in 1824. It is obvious therfore that after 1820 both the army officers and civilians in town increased the number of erven that they owned, but that the civilian owners were more affected by this increasing acquisition of land, than were the groups of army officers owning erven.

The conclusions of this brief analysis of the figures for erven owners and owned erven in Grahamstown during 1814 - 1824 are therefore as follows:-

1. After 1820 the mean number of erven being bought

every year increased noticeably, being about double the figure for the period up to 1820. This increase was due almost entirely to a noticeable increase in the mean number of erven being acquired per year by the civilians.

2. It is only after 1820 that the mean number of erven owned by an owner increased, and it is suggested that this fact is an index of the wave of prosperity which the town experienced after the coming of the 1820 Settlers. This increase is more noticeable in the case of the civilians than the army officers owning erven, suggesting that the civilian population was more affected by the increasing prosperity than was the military population of the town.

3. Whereas in 1814 civilian owners were only just under one-half of the number of erven owners, by 1824 they formed about two-thirds of the erven owners, and this fact suggests that the civilian population of the town increased significantly after 1820 - as indeed it did, with an influx of settlers into the town.(2)

On the basis of these conclusions it would appear that after 1820 the town experienced a period of expansion as a result of the coming of the 1820 Settlers. This expansion and the prosperity which accompanied it appears to have affected mainly the civilian population. These conclusions are supported by other facts given in the body of the text on the history of Grahamstown.

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(2) See Vol. I, p. 49 above.

APPENDIX B.

A LIST OF ACTIVITIES AND DEVELOPMENTS WHICH TOOK PLACE IN GRAHAMSTOWN DURING THE YEARS 1840 TO 1849 INCLUSIVE, COMPILED FROM THE PAGES OF THE "GRAHAM'S TOWN JOURNAL".

In the section on the history of Grahamstown, no attempt has been made to trace developments in Grahamstown after 1840 - the reasons for this course of action have already been given in that section.(1) However, up to the present time, the town has continued to develop and expand, absolutely if not relatively. A glance at Maps No. 3 and 6 in the atlas shows this continued development spatially, and population figures given on page 184, Table VII above show this demographically. To illustrate that development and expansion did occur in the town after 1840 - after the town had passed its zenith as the emporium and metropolis of the Eastern Province - the following list of developments and activities which took place in the town during the 1840's has been compiled from the pages of the "Journal". It would have been impractical, due to the time and labour that would have been involved, to continue this list up to the present time, so that it is only given for the 'forties as an illustration of the fact that the town continued to grow and develop even after it had lost most of its early supremacy and importance.

SEE NEXT PAGE.

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(1) See Volume I, pp. 96-7 above.

(a) Cultural, Political and Social Activities and Developments:

Activity or Development	Reference in "Journal"
1840	
Birthday Ball at Government House (given by Lt. Governor of Colony)	May 28th., 1840
Tenders called for the construction of a Baptist Church in Bathurst St.	Aug., 13th., 1840
A Subscription Ball	Oct. 29th., 1840
Opening of a Public School	Nov. 26th., 1840
A Series of Public Lectures on "Heat, Air, Sound, Light, Electricity, etc." - probably the first venture in the realms of "Adult Education" in the town.	Dec. 24th., 1840
1841	
Nothing of importance	
1842	
Announcement of proposed publication of "The Albany Magazine" in the town - to be issued monthly	Jan. 6th., 1842
A Series of Popular Lectures on Chemistry	Jan. 27th., 1842
A Public Lecture on Astronomy	Feb. 10th., 1842
Laying of the Foundation Stone of the "United Albany Bethren" Clubhouse	Feb. 13th., 1842
Opening of the "Albany Library" on 10th. May, 1842	May 5th., 1842
A Masonic Ball	July 14th., 1842
Formation of the "Albany Rifle Club	Aug. 4th., 1842
Formation of a "St. Andrew's Society" - benefit society	Aug. 25th., 1842
1843	
Advertisement of 86 different types of maps for sale by "Society for Promoting Useful Knowledge" (Maps prepared by society.)	Feb. 9th., 1843.

1843 (Continued):

A Series of Popular Lectures on "Hydronamics and Pneumatics."	Feb. 23rd., 1843
A Public Lecture on "Comets"	March 9th., 1843
Opening of the Baptist Chapel in Bathurst Street	March 9th., 1843
Shares offered to public for the proposed new theatre to be built by the "Amateur Theatrical Society"	June 15th., 1843
Series of Public Lectures on "Chemistry and its Application to Agriculture, and the Useful Arts."	June 15th., 1843
Public Meeting to Protest about the Deteriorating Conditions on the Frontier of the Colony	Oct. 5th., 1843

1844

Nothing of Importance

1845

A Series of Subscription Balls to be held in the town during the Winter	March 6th., 1845
A Lecture on the Human Heart	April 3rd., 1845
The Opening of a Night School	April 3rd., 1845
The Laying of the Foundation Stone of the Wesleyan Chapel - which was to Commemmorate the 25th. Anniversary of the Landing of the First Party of the 1820 Settlers	May 23rd., 1845
Concert of Vocal and Instrumental Music, to be held in the Court House	July 17th., 1845
Opening of a "Classical, Mathematical and Commercial Academy"	Sept. 11th., 1845
Performance of a Series of Oratorios and Sacred Music in St. George's Church	Sept. 18th., 1845
Proposed Formation of a Company to build a Public Swimming Bath	Oct. 9th., 1845
Series of Public Lectures on "Useful and Interesting Branches of Science"	Oct. 16th., 1845

1845 (Continued)

Announcement of proposed publication of "The South African Christian Watchman and Missionary Magazine" in Grahamstown	Nov. 6th., 1845
Report of a "Graham's Town Mental Improvement Society"	Nov. 13th., 1845
Concert of Vocal and Instrumental Music	Dec. 4th., 1845

1846

Nothing of importance

1847

A report of a Public Meeting for the purpose of petitioning for Separate and Independent Government for the Eastern Province	July 17th., 1847
Series of Public Lectures on Astronomy	Nov. 1847

1848

Advertisement of special Juvenile Entertainment by the "Graham's Town Amateur Theatrical Society"	Sept. 23rd., 1848
Grand Ball given by the Military	Oct. 21st., 1848
Formation of an Association for the purpose of Introducing the Cultivation of the Cotton Plant into the Province	Nov. 4th., 1848
Performance by the Graham's Town Amateur Theatrical Society	Nov. 18th., 1848
Lecture on "Plenery Inspiration"	Nov. 25th., 1848
A Performance by a Circus	Dec. 9th., 1848
Steps taken for forming an Agricultural Society in the town	Dec. 23rd., 1848
A Variety Concert given	Dec. 30th., 1848

1849

A Variety Concert given	Jan. 27th., 1849
A Variety Concert given	Feb. 10th., 1849
Report of a "Philomathic Society"	March 3rd., 1849

1849 (Continued)

Publication of the Prospectus of the "Eastern Province Agricultural Society" which is to be formed in the town.	March 3rd., 1849

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(b) Financial and Commercial Activities and Developments:

Advertisement of an Agent in Grahamstown for "The London, Edinburgh and Dublin Life Assurance Society"	Oct. 20th., 1842
Prospectus of "The Frontier Districts Bank" - to have a capital of £45,000	Feb. 16th., 1843
Prospectus of "The Graham's Town Bathurst and Kowie Shipping Co., with a capital of £6,000	Feb. 27th., 1843
Advertisement of an Agent for the "Equitable Fire and Life Assurance and Trust Co."	Feb. 13th., 1845
Formation of "The Eastern Province Trust Co."	June 19th., 1845
Advertisement of an Agent for the "Mutual Life Assurance Society of the Cape of Good Hope"	June 26th., 1845
Formation of the "Eastern Province Life Assurance Society"	Aug. 7th., 1845
Report of Produce sold on the Grahamstown Market during October 1845	Oct. 27th., 1845
Prospectus of the "Frontier, Commercial and Agricultural Bank" which was to be formed in the town with a capital of £75,000	Jan. 23rd., 1847
At this time there were adverts of sales on the Municipal Market of produce brought from the interior. Such an advertisement e.g. tells of 10,600 lbs. ivory, 451bs. Ostrich feathers, 200 Karosses and curios brought from the interior by a trader	e.g.: Dec. 15th., 1849
Report of amount of colonial produce sold on the Municipal Market during the year 1849 - amounting to over £37,000	Jan. 19th., 1850

(c) Municipal Activities and Developments:

Tenders called for the construction of a Town Hall in High Street, and of bridges over drifts in Bathurst and Hill Streets	Dec. 3rd., 1840
Amendments to the Municipal Ordinance - among other items, the town to have nine commissioners	Feb. 2nd., 1843
Tenders called for the construction of a "Market House" on Market Square"	June 8th., 1843
Publication of the Municipal Balance Sheet for 1843-4; the imposition of a 1/- rate for the purpose of buying iron water pipes for the town	Nov. 30th., 1843
Municipality to create a Non-European Location on the east side of the town	May 15th., 1845
Tenders called for iron water pipes	June 10th., 1845
Pipes to be laid from the reservoir to the junction of Beaufort and Somerset Streets	June 24th., 1845
Amendments of the Municipal Regulations - among other things there are to be nine wards, and an increase in area of the town	Sept. 6th., 1845
Tenders called for the purpose of laying iron water pipes to Market Square in Beaufort Street, and to the corner of High Street in Somerset Street, and for the roofing of the reservoir	Sept. 25th., 1845
Tenders called for the laying of iron water pipes in New Street	Oct. 23rd., 1847
Tenders called for the erection of a Municipal slaughter house	Sept. 23rd., 1848
Tenders called for the erection of cattle pens on the Market Square	Jan. 19th., 1850

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APPENDIX C.

A DIAGRAM OF THE PLAN OF THE LAY-OUT OF THE DROSTDY GROUNDS, GRAHAMSTOWN, TOGETHER WITH THE NOTICE OF THE HISTORICAL MONUMENTS COMMISSION.

The following notice has been erected on the Drostdy Arch, Grahamstown, by the Historical Monuments Commission: this notice gives some details of the history of the Drostdy Grounds and serves to explain the accompanying plan, which has also been erected by the Commission:-

"In 1822 Piet Retief began to build the Drostdy on a site where the tower of Rhodes University now stands. The building was never used for magisterial purposes, but in 1830 was used by the Judge on Circuit.

"After the Sixth Kaffir War in 1835, when Grahamstown was the military Headquarters for the forces on the eastern frontier of the Cape Colony, the Governor and Commander-in-Chief, Sir Benjamin D'Urban, instructed the Royal Engineers to plan a "fortified barrack establishment" on the Drostdy ground. Substantial stone buildings were erected for military purposes, and £2,000 was spent to convert the Drostdy into a barracks for one hundred men. By January, 1838, the military prison, now known as the Old Provost (in the Botanical Gardens) had been completed, while the other buildings had either been finished or were in progress. By 1842 it is probable that the entrance Gateway and Guardhouse had been built and the military hospital (now the Botanical Laboratory) was in use by 1846. Military occupation of the buildings on the Drostdy ground continued at intervals until the end of the South African War in 1902.

"In 1864 the first and only Eastern Province meeting of the Cape Parliament was held in Grahamstown. Members of the House of Assembly drove through the Drostdy Gateway after the Session had been opened in Shaw Hall (then Shaw College) and Parliament met in the military hospital building.

"From 1873 the Grahamstown Public School (now Graeme College) occupied the military establishment, but in 1897 the school had to move as the buildings were again required for military purposes.

"On its foundation in 1904 Rhodes University College obtained the right to use the buildings. The old Drostdy was demolished in 1935 to make way for the Rhodes building. Its site is marked by an inscription and four corner stones. The road through this Gateway was closed to traffic in 1940.

"The Albany Museum, the Art Gallery, part of the Botanical Gardens, the Residency, and the greater part of the Rhodes University buildings, including the School of Fine Art, stand on the original Drostdy ground."

Accompanying this notice is a plan showing the present site of the old Drostdy ground, and the layout of the buildings, both historical and modern. A diagram of this plan has been made, and is shown over the page.

In the Photographic Appendix some photographs of buildings on the Drostdy are given. See Photographs No. X - XVI.

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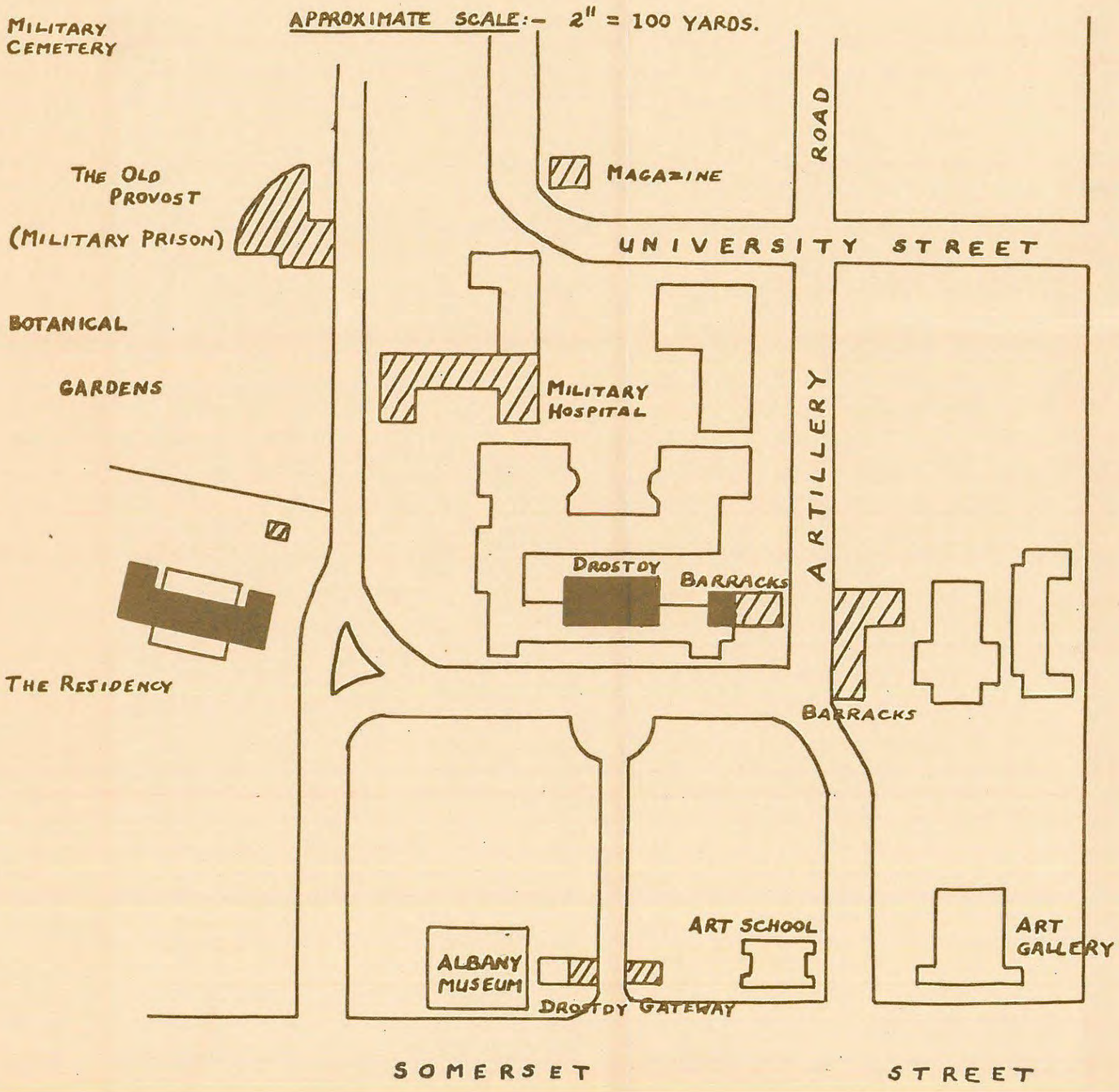
DIAGRAM N°. VIII.

DIAGRAM OF THE PLAN OF THE DROSTDY GROUNDS, GRAHAMSTOWN.

(Based Upon The Plan Of The Drostdy Grounds, Displayed By The Historical Monuments Commission On The Drostdy Gateway.)



KEY TO DIAGRAM:

Chief Buildings In The Drostdy:-

- Modern Buildings
- Historical Buildings
- Historical Buildings (Demolished)

NOTE: This Is Purely A Diagram. Some Of The Buildings Shown May Not Be As Large As They Are Depicted. This However Is Immaterial, As It Is The Layout Of The Drostdy Grounds That We Are Interested In, And Not An Exact Scale Plan Of The Grounds.

Diagram Prepared & Traced by:
A. L. Watts.

APPENDIX D.

A BRIEF OUTLINE OF THE STAGES IN THE BATTLE FOR RAIL ROUTES IN THE EASTERN PROVINCE.

As Described in the Pages of the "Graham's Town Journal."

The following is a series of notes on the stages in the battle for railways in the Eastern Province, compiled from the pages of the "Journal". The notes give some idea of the squirmishes and failures involved in this struggle:-

1. First comment in the "Journal" on the possibility of a railway in the Eastern Province. The editor writes of a proposed survey for a line between Port Elizabeth and Grahamstown. The line is estimated to cost about £606,303. The main difficulties to the scheme are said to be financial. ("Journal" May 12th., 1857.)

2. Graaff-Reinet desires to have a rail link with Port Elizabeth - Grahamstown is not keen on the idea, fearing that the line would endanger its trade. ("Journal" September 1st., 1857.)

3. With the present regime in the Cape Parliament (1858), the split among the Eastern Province towns as to the route the proposed railway should take (some advocating Port Elizabeth to Grahamstown as the route, while others Port Elizabeth to Graaff-Reinet) and with the anti-Eastern Province majority in the parliament, the editor says that there is little hope for railway development at the moment. ("Journal" February 9th., 1858.) (The whole question of a railway in the province was bound up with the

struggle for trade and commerce, and with the political Separatist and Anti-Western Province movements, and this made the issue a complex one.)

4. In 1859 the Cape Parliament voted a sum of money for the survey of a railway between Port Elizabeth and Grahamstown. ("Journal" June 28th., 1859.)

5. The editor of the "Journal" reported in 1860 that a bill would be before the parliament during the session for the construction of a railway between Port Elizabeth and Grahamstown. ("Journal" May 26th., 1860.)

6. A report of a meeting of the Port Elizabeth and Grahamstown Railway Committee to draw up a petition to the Governor asking him to introduce a bill in parliament for the construction of a Port Elizabeth to Grahamstown Railway via Uitenhage. ("Journal" May 6th., 1862.)

7. A report that the government had drawn up a draft bill for the Port Elizabeth to Grahamstown Railway. ("Journal" May 31st., 1862.)

8. A report that the Grahamstown and Port Elizabeth Railway Bill had been passed by the House of Assembly and would go before the Legislative Council for approval. ("Journal" August 5th., 1862.)

9. The Grahamstown and Port Elizabeth Railway Bill was passed and was now an act of Parliament. The guarantee was to be 6% p.a. on the amount actually expended on the line, provided that the amount did

not exceed £750,000. The guarantee was thus £45,000. ("Journal" August 12th., 1862 - also see the additional conditions imposed by the bill.)

10. The Grahamstown and Port Elizabeth Railway Act is published in full in the "Journal" for August 16th., 1862.

11. A report that the government is calling for tenders for the construction of the Port Elizabeth to Grahamstown railway. ("Journal" September 13th., 1862.)

12. Report in the "Journal" that the "London News" reports that there is a hitch in the attempts to raise the capital required for the construction of the railway. The editor of the "Journal" feels that the whole issue will be left till the next session of parliament. (A company had been formed to raise a sum of £1,200,000 as capital for the proposed railway, but the Cape parliament had upset arrangements by reducing the amount guaranteed in the act.) ("Journal" November 25th., 1862.)

13. A report in the "Journal" that because of the conditions laid down in the act by the Cape parliament, no first class tenders had been made, and only speculative, worthless tenders had been offered. Thus the scheme collapsed for a while. ("Journal, December 26th., 1862.)

14. A report that the report of the Colonial Railway Engineer to the Cape parliament had been published. The provisional estimate of costs was at least £9,000

per mile for the construction of the line. ("Journal" May 5th., 1863.)

15. A report that the Grahamstown and Port Elizabeth Railway Act had been scrapped by the Cape parliament, and that the new one before parliament was only calling for surveys and estimates of the route. ("Journal" June 9th., 1863.)

16. A report in the "Journal" that the Cape Government had been rather hasty in its action in the question of finances for the Cape Town - Wellington line, and had fallen into the hands of a company which was bent on squeezing the last penny of profit it could out of the government. Thus the government was very cautious over the proposed railway for the Eastern Province, and was insisting that a really reliable survey should be made - it was not satisfied with the previous incomplete surveys. ("Journal" January 8th., 1864.)

17. A depression occurred in the Colony during the second half of the 1860's, resulting in parliament shelving the railway issue for the while. ("Journal" August 6th., 1866.)

18. No further developments occurred until the discovery of diamonds dispelled the depression in the Colony. Now the question of railways in the Eastern Province was reopened with increased enthusiasm. Pages 122 to 127 in Volume I of this study briefly trace developments in the railway issue after the discovery of diamonds, until 1875 when a final decision was made.

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APPENDIX E.

DETAILS OF THE NUMBER OF MEDICAL PRACTITIONERS AND MEDICAL SPECIALISTS IN PORT ELIZABETH, EAST LONDON, AND GRAHAMSTOWN, JANUARY 1953.

The distribution of the different kinds of medical specialists in Port Elizabeth and East London, excluding dental surgeons, is given below:-

TABLE

MEDICAL SPECIALISTS IN PORT ELIZABETH AND EAST LONDON

TYPE OF MEDICAL SPECIALIST	No. in Port Elizabeth	No. in East London
Anaethetist	3	2
Child Specialist	1	-
Ear, Nose and Throat Specialist	3	3
Gynaecologist & Obstretician	4	2
Opthalmic Surgeon	4	3
Psychiatrist	2	-
Radiologist	3	3
Skin Specialist	1	-
Specialist Physician	-	1
Surgeon	2	-
Surgeon - Orthopaedic	2	2
Urologist	1	-
T O T A L	26	16

Source: The Telephone Directory for Port Elizabeth, East London and Neighbouring Districts, January 1953: Dept. of Posts and Telegraphs: pp. 50-52; 121-122.

The number of general practitioners in Port Elizabeth was 102; in East London 47; and in Grahamstown 16. (ibid., p. 193.) In addition Grahamstown had two opthalmic surgeons, but by the end of 1953 one had died, and the other had left the town, so that there were no specialists in the town in private practice by the end of 1953. (There were several psychiatrists at the Fort England Mental Hospital in the town.)

Dental surgeons are not given, as the directory did not list them separately, as was the case with medical practitioners, and paging through the directory to find dental surgeons was not practical.

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APPENDIX F.

METHODOLOGICAL APPENDIX BRIEFLY DESCRIBING THE MAIN METHODS USED FOR COLLECTING DATA RELATING TO PRESENT -DAY GRAHAMSTOWN.

Following Chapin's division of the methods used in Sociology[1] we may divide into two categories the methods used for the purpose of collecting data during the course of the study of present-day Grahamstown itself:-

I The Historical Method (involving Indirect Observation.)
II Field Work Methods (Direct Observation.)

I The Historical Method:

This method involved the extraction and collection of data from existing government, municipal, and institutions' records. Such sources as birth and death records, school registers, municipal valuation records, etc., were used. In all cases, the records were of statutory bodies or public bodies required by law to keep accurate records, so that the chances of inaccuracies existing in these records were not likely to be serious enough to materially alter the pattern presented by the groups of phenomena concerned. Furthermore, as only one person - the investigator - collected all the data, it was possible to ensure a uniformity of definition in the collection of data. Every effort was made to ensure that all data were accurately extracted. This method of collecting data presented no problems.

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(1) F.S. Chapin: Field Work and Social Research: The Century Co., New York, 1920: Chs. II and III.

II Field Work Methods:(2)

We may conveniently divide the field work methods used during the study into two categories - those methods used by the investigator himself working alone, and those methods involving the use of a team of investigators. While the same methods were often used in both categories, the problems of individual and team work methods are different, so that we must discuss them separately:-

(i) Methods Used by the Investigator Working Alone:

A. Controlled Personal Observation:

This method involved the observation of, and recording facts about, various types of phenomena. In all cases before any field observations were made, definitions controlling the observation and types of phenomena to be studied were drawn up - and where necessary, preliminary pilot observations were made to ensure that all definitions were workable. Thus, the defining of what classes of phenomena were to be observed, and of what characteristics related to these phenomena were to be recorded, was carefully controlled. In all cases, only objective characteristics readily defineable, and not subject to individual subjective feelings or tastes, were observed. So it was that this method was used for constructing the Land Utilisation Map for Grahamstown, and other maps showing the spot location of different types of phenomena such as double-storied houses, types of houses, checking the Municipal Map of the area (which was found to have about a dozen inaccuracies) etc. As all these observations

(2) The bibliography at the end of this study lists several books which deal with field work methods - e.g. books by Chapin, Young, and Lundberg.

were made by the investigator only, and strict control over definition and observation methods was maintained, a uniformity of definition and observation technique was possible. Total counts were made, so that sampling problems were not encountered. The use of this method was therefore straightforward, and except for the fact that it was very laborious and time consuming when a large field is involved,[3] it presented no problems.

B. Interview Method:

This method was used not so much for the purpose of obtaining data directly as for the purpose of gaining access to existing records. It was also used to obtain from important persons in the town an idea of what problems existed and should be studied. In all cases, the interview was a guided one, and detailed schedules of what information was desired were always carefully prepared before the interview. Information sought was always limited to pragmatic facts, or the results of the experience of the informant - subjective statements were not recorded. After each interview, all data collected during the course of the interview were carefully edited, and where possible, checked against data from records (if permission to have access to records was granted.)

It should be noted that all those who were interviewed were most co-operative and pleasant to deal with.

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(3) In the case of the Land Utilisation Map for the town, for instance, every one of the 160 streets, and odd lanes in the European area of the town had to be visited and revisited before a complete map was prepared, and well over 100 miles had to be covered in all on foot, by bicycle and car.

In most cases access to the records asked for was granted, and if such access was refused, it was either because of legal restrictions, or because the informants felt that it was not in their own interests to divulge information (this occurred in the field of economic enterprise.) Failures to obtain information are reported in the relevant sections of the study. For the rest, the use of this method did not present any special problems.

(ii) Methods Used by a Team of Field Workers:

Teams of students were used to obtain, by means of a social survey of the European area of the town, data that could not be obtained in any other way. The survey involved the use of interviewing, and of schedules controlling observations. The problems involved were of the type met with in making any social survey, and involved problems not only of actual field work, but of project design, and sampling. Because of the importance of the methodological problems involved, the following appendix is specially devoted to the topic.

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APPENDIX G

THE SURVEY OF THE DEMOGRAPHIC CHARACTERISTICS OF THE EUROPEAN POPULATION OF GRAHAMSTOWN.

The survey into the demographic characteristics of the European population of Grahamstown was designed to provide such demographic and ecological data about the population as were required for the investigation, but which were not readily available from existing sources of data.

The first stage in planning the survey was the construction of a list of the number of houses in each street. Consequently the writer undertook a complete enumeration of the houses within the European Area of Grahamstown in 1951. This count was subsequently checked by social science students of Rhodes University, under the direction of the investigator, and so may be taken as accurate. The street list below gives the results of this enumeration:-

A LIST OF STREETS IN THE EUROPEAN AREA OF GRAHAMSTOWN, SHOWING THE NUMBER OF HOUSES IN EACH STREET.

- 1951.-

STREET	No. of Houses	STREET	No. of Houses
African Street	58	Bartholomew Street (1)	21
Allen Street	11	Bathurst Street	35
Anderson Street	12	Beaufort Street	62
Anglo-African St.	2	Bedford Street	10
Artillery Road	3	Belmont Road	11
Atherstone Street	12	Bertram Street	4
Ayliff Street	11	Blaine Street	2
Balfour Terrace	6	Burton Street	0
Barrack Street	2	Butler's Lane	2

(1) Also known as St. Bartholomew's Street.

STREET	No. of Houses
Caldecott Street	7
Campbell Street	11
Carlisle Street	7
Carnarvon Street	5
Cartwright Avenue	6
Cathcart Street	8
Cawood Street	0
Chadwick Lane	2
Chapel Street	20
Charles Street	12
Chase Street	4
Cloughley Street (2)	0
Cobden Street	16
Cole's Lane	2
Conclore Street	3
Constitution Street	10
Cradock Road	1
Croft Street	4
Cromwell Street	10
Cross Street (3)	24
Currie Street	15
Cuyler Street	5
Darling Street	4
Donkin Street	18
Douglas Lane	0
Dundas Street	1
Durban Street	6
Firtree Street	3
Fitzroy Street	33
Fletcher Street	2
Florence Street	5
Fordyce Street	0
Francis Street	23
Fraser Street	3
Frederick Street	1
Frere Street	15
Froude Street	3
George Street	22
Gilbert Street	4
Glanville Street	1
Goldswain Street	6
Gowie Street	4
Graham Street	8
Grant Street	3
Grave Street	0
Grey Street	5
Grocott Street	0
Hare Street	4
Harrismith Street	13
Hellier Street	8
Helm Street	5
Hemming Street	1
Henry Street	15
High Street	16
Hill Street	45
Hodges Street	27
Holland Street	5
Hope Street	9
Howick Street	0
Howse Street	5
Hudson Street	5
Huntley Street	7
Jackson Street	8
Jarvis Street	4
Kennelly Street	0
King Street	3
Knight Street	6
Kowie Street	25
Lansdowne Street	7
Lawrence Street	27
Leicester Street	9
Livingstone Street	2
Luke Street	3
MacDonald Street	9
Market Street	35
Market Street East	12
Marshall Street	6
Matthew Street	7
Maynard Street	2
Miles Street	0
Mill Street	2
Milner Street	25
Montague Street	3
Mount Street	2
Musgrave Street	2
Napier Street	11
Nelson Street	2
New Street	44
Oak Tree Terrace	2
Oatlands Road	31
Ogilvie Street (3)	3
Orsmond Terrace	6
Park Road	25
Parker Street	4
Pear Lane	3
Prince Street	3
Prince Alfred Street	16
Queen Street	10
Retief Street	2
Rhodes Avenue	5
Rivers Street	0
Roberts Street	8
Robinson Street	1
Rose Street	7
Ross Street	2
St. Aidan's Avenue	6
Sampson Street	0
Saunders Street	6

(2) This street is a grass space
(3) Houses in the European part of the street only are counted.

STREET	No. of Houses	STREET	No. of Houses
Scott's Avenue	8	Wallace Street	0
Selbourne Road	6	Walker Street	2
Seymour Street	1	Warren Street	3
Short Street	2	Watermeyer Street	9
Somerset Street	40	Watson Street	0
South Street	9	Webber Street	10
Southey Street	1	Webb's Avenue	7
Speke Street	8	West Street	9
Spring Street	10	White's Road	6
Stanley Street	0	Whitnall Street	2
Temlett Street	1	Wilcox Street	2
Thackeray Street	4	William Street	5
Thompson Street	9	Willshire Crescent	10
Trollope Street	17	Wolseley Street	4
University Street	2	Worcester Street	15
van Ryneveld Street	1	Wright Street	5
Victoria Street(3)	0	York Street	26

VARIOUS LANES NOT INCLUDED ABOVE

LOCATION OF LANE	No. of Houses
The Port Alfred Road (from Hill Street to the corner of George Street.....	1
The Top (West) Lane off Robinson Street.....	5
The Bottom (East) Lane off Robinson Street...	2
"Old Power Station Cottages" (Lane behind the R.M.T. Depot, off Orsmond Terrace).....	4
The Street off Market Street East.....	1
Lane off Market Street opposite Nelson St....	2
Lane off Somerset Street by the Museum, which extends past the Botanical Gardens.....	2
West Hill Extension (area beyond the end of Durban Street and other parallel streets)....	5
Space off North Side of Beaufort Street near York Street	6
Lane linking Market and Robinson Streets	0
Street joining Sampson and Cobden Streets behind the Station	3
Street linking Kowie and Chapel Streets - (which is a continuation of MacDonald Street.	0
Road in front of Rhodes University Tower	0
Street crossing North end of Graham Street ..	0

Lane joining Ayliff and Charles Streets.....	0
Path off Kowie Street, by the stream, running eastwards parallel to Beaufort St...	1

TOTAL NUMBER OF HOUSES LISTED IN THE EUROPEAN AREA = 1,433

In all cases, semi-detached houses in the area were counted as two separate houses, except in two instances (one in Gowie Street, and one in Kowie Street) where it was revealed by the survey that two semi-detached houses were being used as ONE house by the occupants. Houses only are listed above. Boarding Houses, Hotels, Hostels, and Flats were not counted. Houses being built were also excluded from the count.

The next stage in the survey after the preparation of an accurate street list, was the construction of an interview schedule for the gathering of the data. This schedule was tested by means of a pilot survey in the early part of 1951, when 35 householders from four streets in the town were interviewed. As a result of this pilot survey, certain minor changes were made to the interview schedule, which eventually took the form given below:-

SEE NEXT PAGE

COPY OF SURVEY SCHEDULE

NAME OF STREET	DATE OF SURVEY .....
No. OF HOUSE	

Rhodes University, Grahamstown
Social Science Dept.

HOUSING SURVEY OF GRAHAMSTOWN, 1951

ANSWERS TO BE OBTAINED BY INTERVIEWING THE HOUSEHOLDER: Whenever you have reason to doubt the truthfulness of a reply, state so at the end of that question, giving the reasons making you doubt it, and what you think the true answer might be. Where the house is subdivided into flats (e.g. upstairs & downstairs in a double-storied house) USE A SEPARATE QUESTIONNAIRE FOR EACH FLAT.

---

1. No. of people living in the house/flat .....

	No.	Approx. age of each
2. No. MALES OVER 10 yrs. age	...	.....
No. FEMALES " 10 " "	...	.....
No. MALES UNDER 10 " "	...	.....
No. FEMALES " 10 " "	...	.....

3. How many families are there in the house/flat? .....

4. If there is more than one family sharing the house/flat, give the composition of each family, showing the age in brackets after the sex of each member:-

   (a) .....

   (b) .....

5. Are any of the persons listed in (2) relatives? .....

6. If there are any relatives, fill in the data below:-

Age	Sex	Relationship	Marital State
.....	.....	.....	
.....	.....	.....	
.....	.....	.....	

7. Are any of the persons listed in (2) lodgers? .....

8. If there any any lodgers, fill in the data below:-

Age	Sex	Marital State	Relationship (if any)
.....	.....	.....	.....
.....	.....	.....	.....
.....	.....	.....	.....

9. Give the marital state of other adults in the house/flat other than lodgers or relatives:-

Age	Sex	Marital State	Relationship
.....	.....	.....	.....
.....	.....	.....	.....
.....	.....	.....	.....

10. Home Language of the Occupants ..... (if any of the relatives or lodgers have a different home language, what is it? .....)

11. Race of the Occupants .....

12. No. in house/flat who are working ..... (If anyone is retired, state so under "Occupation".)

Age	Sex	Relationship	Place of Work & Occupation
.....	.....	.....	.....
.....	.....	.....	.....
.....	.....	.....	.....

N.B. If there are two or more families sharing the house/flat state after occupation whether the person belongs to family (a) or (b) etc. on page 1, question 4.

13. No. of rooms in the house/flat (excluding K.P.B.) .....

14. Are any rooms (including k.p.b.) shared in common with people of another flat? ..... If so, what are the functions of these rooms? .....
Give the number of such rooms .....

15. No. of bedrooms in the house/flat .....

16. Are any of these bedrooms also used as living-rooms? ..... If so, how many such rooms are there? .....

17. No. of beds in house/flat which are used <u>DAILY</u>:-
(i) Double beds .....
(ii) Three-quarter beds .....
(iii) Single beds .....

18. No. and function of rooms other than bedrooms or k.p.b.: .....
.....

19. Is there a separate room used as a pantry? .....

20. Is there a separate room used as a scullery? .....

21. Is the house supplied with electricity? .....

22. What type of stove is in the kitchen? .....

23. How is water heated for the bathroom? .....

24. Is the bathroom outside? ..... Is it shared with others? (i.e. persons from another flat) .....

25. Is the lavatory outside? ..... Is it shared with others? .....

26. Is there a separate Native's lavatory? .....

27. Is the house/flat owned or rented? .....
If rented, where does the owner stay? .....

28. No. of outbuildings on the stand ..... Are any slept in by Europeans? ..... Give the nature of other outbuildings: Tick off the correct ones: Garage ( ); Servant's room(s) ( ); Store-room ( ); Others (give types) .....

29. No. of servants ..... Do they sleep on the premises? ..... Which of these servants work there daily? .....
.....
If no daily servant, how often does the servant come? .....

NAME OF INVESTIGATOR: .....

The main survey with this schedule was started in August 1951, and continued until the end of the first academic term of 1952. Excluding the time when the students used were busy with examinations, and then on vacation, nine months were spent in making the survey. Second and Third Year Social Science Students of the Department of Social Science of Rhodes University were used as interviewers. (First year students were not used, as they did not possess sufficient training for

interviewing.) During 1951 nine third year students, and five second year students were used - a total of fourteen interviewers. During 1952 the number of students available dropped to a total of five regular helpers, and three temporary helpers. The students undertook the interviewing as part of their compulsory practical work, and so had to make a minimum number of interviews each term. This was an advantage, as it meant that the investigator had more control over them and their manner of conducting the interviews than would have been the case if they had been purely voluntary workers. Before the students were sent out into the field they were carefully briefed, and all the necessary definitions and interpretations to be used were explained. Thereafter they were all met regularly every week, and the returned schedules checked, and problems discussed and dealt with. Thus, throughout the course of the survey the investigator kept in close contact with the interviewers, and directed their work.

The survey was orignally planned as a complete enumeration of the stable core of the European population of the town - i.e. excluding students and scholars in the town whose home towns were elsewhere, and excluding inmates of the various hospitals in the town. As there were in 1951 a total of 1,433 houses in the area, and only a handful of flats, boarding houses and residential hotels, plus staff hostels at the various educational institutions, the task was considered feasible. The advantage of a total count was that problems of sampling error and bias, and of statistical estimation and inference could thereby be avoided.

However, due to circumstances which had not been foreseen, and which were beyond the control of the investigator, during 1952, as has been mentioned above, the number of student-interviewers dropped from fourteen to five regular and three temporary interviewers. Eventually, these were withdrawn, as they were required for other purposes. In effect then, the survey which had been planned as a total enumeration ended as a sample. This was unfortunate, and immediately raised all sorts of fundamental methodological questions. Basicly, the question was whether the sample which had been surveyedcould be used for analytical purposes, or whether it was worthless. In fact, the nature of the sample would determine whether or not it could be used. Because of the importance of these question, a very careful study was made of the whole problem:-

Size of the Sample:

The ultimate sample consisted of 989 houses, containing 1,069 households, from the official European area of Grahamstown. Of these, 965 houses were classified as containing 1,044 European households. The sample of houses (989) formed 69.11% of the total of 1,433 houses concerned. Mathematically, therefore, the sample was large - and large enough to reduce chance variation to a reasonable level.(4)

Sampling Errors:

In any sample, two types of errors have to be watched - accidental chance errors, which can be reduced in

(4) A sample of over 30 cases is mathematically a large sample. See e.g. J.G. Peatman: Descriptive and Sampling Statistics: Harper Bros., New York, 1947: p. 355.

importance by increasing the size of a sample, and secondly persistent errors, due to biases. In the case of chance random errors, the effect of these is reduced in proportion to the square root of the size of the sample - it was considered that a sample of 1,044 households was adequate for the purposes of this study. The question of bias is one of the perennial headaches of the social scientist, and is not so easily taken care of. While the theory of statistical estimation and inference has been developed to take care of chance random sampling errors, no device can be used for turning a biased sample into a random sample once fieldwork has been completed. Consequently, the question of bias in the sample was of cardinal importance.

Biases in the Sample:

In the first instance, the sample was restricted to that portion of the population of Europeans which lived in houses in the town. This means that any generalisations would have to be limited to that population, and due allowance made for the influence of the population living in boarding houses, hostels, and hotels and flats. From what is known of the latter population, it was concluded that it is fairly certain that it had an excess of females over males, and tended to consist of unmarried persons, or couples without children, or whose children were living away, so that the average age of this population would probably be in the older age groups about middle age. Therefore, the survey sample for households would underestimate the age of the population, and overestimate the sex-ratio

of the total stable core of the European population in the town. It is also likely, in view of the predominantly non-manual nature of the occupations of the population outside houses, that the sample from houses would also underestimate the proportion of non-manual workers in the total population of Europeans in Grahamstown. These biases can be taken into account when interpreting the sample results.

A second bias in the sample was introduced by the fact that it was limited to the official European area of the town, and so excluded European households living just inside Non-European areas in the town. Thus the sample was biased in favour of households of higher socio-economic status. However, it is known that the number of households thus excluded was very probably less than thirty (probably being twenty households or less), so that these households form only about 1½% to 2% of the European households in the town. This bias is thus probably not serious.

It has been said that the sample was limited to households occupying houses in the European area of Grahamstown. The survey unit was the individual house. The major question involved is how far this sample can be taken to be representative of the population in houses in the European area of the town. Fortunately, this problem can be gone into in some detail, as the survey returns provide the necessary information.

As it was not intended that the survey should be a sample survey, but a complete enumeration, the resulting sample was not a random sample, but what one might call a

"judgement sample."[5] A few months before the survey had to be terminated, the investigator realised that the aim of a total enumeration would not be achieved, and consequently during the remaining months of field-work every effort was made to eliminate biases, and to secure as representative sample as possible. In this manner it was hoped to secure a sample which could be confidently used for the study. Streets from which a very low rate of response had been obtained, were re-visited until the response level had risen to a point where further fieldwork in the street concerned was un-productive. A study was made of the ecological distribution of houses which had not been visited, and fieldwork was directed so that when the survey finally stopped, no discernible ecological bias existed in the group of houses which had not been visited. By these means, an attempt was made to avoid what has been called a "chunk"[6] rather than a sample - i.e. a "slice of a population .... dictated by convenience" and not by strict control and planning. A total of 145 houses in the European area of Grahamstown were not visited during the survey, or 10.1% of the total of 1,433 houses in the area, so that 89.9%, or nine-tenths of the houses were visted, and as far as could be determined, these nine-tenths formed a representative sample of all the houses involved. As 13 of the houses visited were vacant, there were a total of 1,275 houses from which survey returns should have been obtained.

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(5) W.E. Deming: Some Theory of Sampling: John Wiley & Sons, Inc., New York: 1950: pp. 9 - 14.

(6) Ibid: p. 14.

Bias due to Non-Response:

Bias due to non-response is one of the problems with which any sociologist has to contend when making a survey. It is now well-known that it is not safe to assume that non-responders are a random cross section of a population, but that they do tend to constitute a selected group, which can introduce serious bias into a survey.(7) The incidence of non-response affecting the survey is given in the table below:-

TABLE XXIX.

TYPES OF NON-RESPONSE ENCOUNTERED BY THE SURVEY

TYPE OF NON-RESPONSE	No.	% OF HOUSES VISITED
Householder Out	218	17.10
Householder Known to be Working	33	2.58
Interview Refused	20	1.57
Miscellaneous	15	1.18
T O T A L	286	22.43

The student interviewers were instructed to visit a house on three occasions, if need be, in an attempt to find the householder in. As the table shows, 17.10% of the houses visited were cases where a householder was not in - either because both husband and wife were working, or the woman of the house was always out, etc. In 2.58% of the houses visited, it was definitely ascertained that both husband and wife were working. The fact that only 1.57% of the houses visited yielded refusals reflects favourably on the co-operation received by the interviewers. The 1.18% miscellaneous reasons for non-response involved

(7) See Public Opinion Quarterly; Vol. VIII, 1944, pp. 254-61.

reasons such as the fact that the householder was away on holiday, the householder was sick, or too deaf to be interviewed, etc. Of the types of non-response listed in the table, it is considered that only the total of 251 cases (or 19.68% of the 1,275 houses visited) where the husband and wife were both working, or the householder was out for some other reason, present a serious problem. A non-response of about one-fifth of the houses visited due to the householder being out is a large figure, and the experience gained from re-surveying some of the streets with the highest level of non-response indicates that if fieldwork could have been continued for a further period, the above figure could have been reduced considerably. Early morning and evening interviews nearly always found absent householders at home, but unfortunately they could not be continued indefinitely until the level of non-response had dropped to only a small percentage.

A careful study was made of the ecological distribution of the cases where the householder was out when the interviewer called. The level of non-response due to this cause was approximately the same in all ecological areas of the town, so that there is no problem of one type of area being more seriously affected by this type of response than another. (In directing the fieldwork in the closing stages of the survey, the policy was to re-survey areas with a higher rate of cases where the householder was out, and to continue re-surveying until all areas had about the same level of response - this was in fact achieved.) It is definitely known that up to a point the type of reason why the householder was out (e.g. both husband and wife were working, or the wife was a social "gadfly")

tended to vary with the type of ecological area. There can be no doubt that the sample is biased against households where both husband and wife work, and that consequently it under-estimates the number of women working. However, households with both husband and wife working were not restricted to one type of socio-economic class area, as to-day it is not only the wives of poorer men who work, and likewise were not restricted to one age group, or one type of family. It is considered that the bias due to the householder being out is largely self-cancelling in this case, and that on a relative basis the percentage distributions obtained from the sample present an approximation of the demographic structure of the town. Absolutely the sample will under-estimate certain phenomena, but as it is the almost entirely the relative distribution of phenomena with which the study of the present-day town is concerned, it is considered that the end bias is not serious, and that the sample results can be used for analytical and comparative purposes. If, for argument's sake, the incidence of non-response due to the householder being out had not been roughly the same in all the ecological areas of the town, then there would be no grounds whatsoever for assuming that the biases introduced would be largely self-cancelling, and the sample could not have been used - fortunately, this does not seem to be the case.

To sum up, the sample is not a probability sample, but a judgement sample. in which the degree of error cannot be known. This means that no standard errors, or other measures of the precision of the sample can be used. Consequently, the analysis does not make use of

the statistical techniques and theory of inference. The sample is definitely subject to errors, the extent of which can only be guessed on the basis of judgement. Because the sample is a judgement sample it is inevitably a sample that falls short of the standard of a good probability sample, where the limitations and errors of the sample are definitely known. It cannot be stressed too strongly that unless complete enumeration is possible, probability sampling, and an analysis based on the theories of statistical estimation and inference should be the goal of every sociologist, - and too, judging from the experience of this survey, that it is wiser to underestimate one's field resources, and to allow for possible reduction in these resources, and so plan one's project design accordingly.

In the write-up of the analysis of the survey results, an attempt is made throughout to make the reader conscious of possible under- or over-estimations. The results of <u>any</u> sample - be it random sample or otherwise - can yield only estimates of the parameter values in which we are interested. Because confidence limits can only be calculated for probability samples, they are not used in the analysis of the survey results. Consequently, the figures given are rather in the nature of point estimates, but the write-up is so worded as to stress the fact that they are only approximations of the truth, and not actual parameter values.

In conclusion, a 69.11% sample, consisting of 989 houses was surveyed. (Due to unforeseen causes a total enumeration was not possible.) After a careful study, it was concluded that the sample was a useable judgement sample.

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APPENDIX H.

THE SIZE OF THE PERMANENT CORE OF EUROPEANS IN THE TOWN, AND THE RELATION OF THE SURVEY SAMPLE TO IT.

The 1951 census gave the size of the European population of the town as 8,680 persons (see p. 176 above.) However, at the time of the census, several private schools in Grahamstown were closed - viz. the Diocesan School for Girls, St. Andrew's Preparatory School, St. Andrew's College, St. Aidan's College, and Kingswood College. The 1951 intake of scholars by these institutions was not known by the investigator, but in 1952 data concerning the number of scholars at these schools were collected. In these five schools a total of 1,154 scholars came from beyond Grahamstown, and 200 lived in the town. Thus, assuming that the 1951 figure was about the same as the 1952 figure - and there is no known reason to suppose otherwise - then perhaps 1,200 to 1,300 scholars were absent at the time of the census. (The 200 town scholars at the five schools would have certainly contained a good proportion away on holiday at the time of the census, so they have been added in.) If we further assume that in each of the five schools an approximate average of 20 members of the teaching and administrative and catering and housekeeping staff were on holiday, then at a low estimate 100 further persons were away. Thus, it would be safe to assume that about 1,400 persons were away at the time of the census, and this would bring the term-time European population of Grahamstown during 1951 up to about 10,000 persons at least.

Now, in 1952 there were 3,978 students and scholars

at the various European educational institutions in Grahamstown. Of these, 2,336 came from beyond the town and its immediate district. (Table IV, pp. 161-3 Volume I above). As the staff of the educational institutions must be counted as part of the permanent "core" of Europeans in the town (in the sense that they earn their livelihood in Grahamstown) this means that the permanent core of Europeans in the town in 1951 was about 10,000 - 2,336 = approximately 7,600 persons.

Part of the European population of the town counted by the census was an institutionalised population in the hospitals of the town. The average number of resident European patients at the Fort England Mental Hospital is about 690 to 700 cases, while the Prince Alfred Infirmary has about 70 to 80 resident European patients. The Settlers' Hospital usually has about 42 European patients.(1) Thus, the total number of Europeans in this institutions is about 800 or more. On this basis it is estimated that the size of the permanent core of non-institutionalised Europeans in Grahamstown in 1951 was approximately 7,600 - 800 = 6,800.

In the previous appendix it was reported that the sample survey of the European area of Grahamstown amounted to a 69.11% sample containing 989 houses. The sample contained 3,938 Europeans, which would give an estimate of about 5,700 Europeans living in houses in the town. An estimate of the number of Europeans who were not institutionalised, and were living in dwellings other than houses during 1951-2 would be 6,800 - 5,700 = 1,100 persons.

(1) Data supplied by the hospitals concerned.

It appears therefore that the survey sample refers to more or less 84% of the normal permanent core of Europeans in Grahamstown.

Of the estimated number of approximately 1,100 Europeans not living in houses in Grahamstown, the majority live in either the Roman Catholic convent or the Anglican convent in the town, and as staff in the various educational hostels,(2) and two orphanages in the town. The remaining proportion of Europeans live in flats, boarding houses, and hotels, but in view of the small number of such dwellings, the number of Europeans involved must be small. There can be no doubt therefore that the population not living in houses is, in Grahamstown at any rate, largely non-manual, and with an excess of females, and of an older average age than the population living in houses. The survey sample therefore will be likely to under-estimate the proportion of non-manual workers in the town, as well as under-estimate the mean age of the European population, and the degree of femininity.

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(2) Nurses in hostels at the three hospitals in the town should be added to this list of Europeans not living in houses in Grahamstown.

APPENDIX I.

THE OCCUPATIONAL CLASSIFICATION USED FOR THE STUDY OF GRAHAMSTOWN.

On pages 235 - 236 the occupational classification used for the study of Grahamstown has been given. Examples of the types of occupations falling into each category are given below:-

A - HIGHER PROFESSIONAL AND ADMINISTRATIVE CLASS:

Advocates, Lawyers, Clergymen, Teachers, Dentists, Doctors, Judges, Magistrates, Scientific Personnel, Musician, Accountants, Company Secretaries, Secretaries of Institutions, Engineers, Architects, Postmaster, etc.

B - INDEPENDENT COMMERCIAL, AGRICULTURAL AND MANAGERIAL:

Proprietors of Wholesale and Larger Retail Enterprises, Agents, Auctioneers, Brokers, Farmers, Travellers, Managers of Commercial and Manufacturing Enterprises, high Police and Defence Force Officers, Large Contractors, etc.

C - SUBORDINATE COMMERCIAL AND CLERICAL CLASS:

Small Shopkeepers, Clerks, Salesmen, Shop Assistants, Typistes, Office Workers, Small Contractors, Minor Technical (Non-manual) Personnel, etc.

C_1- CERTAIN TYPES OF PERSONAL SERVICE:

Nurses, Male Nurses, Medical Orderlies, Companion-helps, Matrons, Hairdressers, Dressmakers, Tailors, Janitors, Caretakers, Undertakers, Barbers, etc.

D - SKILLED MANUAL WORKERS:

Plumber, Electrician, Mechanic, Printer, Welder, Blacksmith, Builder, Mason, Bookbinder, etc.

E - SKILLED AND SEMI-SKILLED WORKERS IN SUPERVISORY OR OR POSITIONS OF RESPONSIBILITY:

Foremen, Engine Driver, Bus Driver, Police Constable, Lower Ranking Officers and N.C.O.'s of Police and Defence Forces, etc.

F - SEMI-SKILLED WORKERS:

Apprentices, Factory Hands, Lorry Drivers, Bakers, Blockmen, Fireman, Shunter, etc.

G - UNSKILLED WORKERS:

Labourers, Menial Domestic Servants, Soldiers, etc.

H - J : These categories are self explanatory.

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SELECTED BIBLIOGRAPHY.

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