

THE BORDER REGION

[ms.] ; A geographical study of land utilization

(Dissertation approved for the degree
of Doctor of Philosophy of
Rhodes University)

/ by

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PREFACE

The greater part of this work was undertaken by the author as a research officer of the Border Regional Survey from 1955 to 1958. It was completed whilst on the teaching staffs of the University College of Swansea and the University of Cambridge between 1958 and 1960.

The nine chapters included in this thesis are virtually identical with those prepared for publication by the Oxford University Press as part of the volume "The Border Region: Natural Environment and Land Use in the Eastern Cape Province", for the Institute of Social and Economic Research, Rhodes University. For the sake of comparability with that report the original numbers of chapters have been retained. Chapter 2 (Geology) by Professor E.D. Mountain, Chapter 5 (Vegetation) by D.M. Comins and Chapter 6 (Some Typical Soils) by C.J. Bader are to be found only in the published report. Cross references to those chapters occasionally occur in this text: they can be pursued only by reference to the published version. Because studies of the geology, vegetation and soils are due to appear in published form in the very near future no summary of that material is presented here. It is considered that these nine chapters are sufficiently self-contained to overcome that disadvantage.

The collection, analysis and interpretation of the material, in this thesis were the work of the author. The

final draft has been considerably amended and edited by Professors J.V.L.Rennie and E.D.Mountain, who were concerned as joint editors to prepare these nine as well as the other three chapters for publication. As this had to be completed in time for submission to the National Council for Social Research by August 1960 to qualify for a publication grant in 1961, material changes were made by the editors rather than by the author acting on their advice. These changes would have been made by the author acting on the advice of his supervisor, Professor J.V.L.Rennie, during the ordinary course of thesis preparation, had it not been for the urgency in completing the work for submission to the National Council for Social Research.

Cambridge, November 1960.

ACKNOWLEDGEMENTS

This survey was made possible by the active cooperation of many organisations and persons both in the Border region and elsewhere and I thank them all for their valued assistance.

Firstly the Buffalo Catchment Association which initiated the whole undertaking and gave material assistance from time to time, and its secretary, Mr J.A.Chew, whose enthusiasm, sound advice, encouragement and practical help did much to make the survey a success.

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Thirdly the various government departments who helped unstintingly in a variety of ways and whose cooperation was of fundamental importance in many instances.

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The Department of Agriculture, which gave very great help in various ways; advice, as well as general access to

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The Department of Bantu Administration and Development (formerly the Department of Native Affairs), through the Chief Native Commissioner and the Native Commissioners of East London and King William's Town for allowing free entry to the Native Reserves, for placing at my disposal unpublished information, and for very helpful general advice.

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The Directors of the East London Museum, the Kaffrarian Museum in King William's Town, and the Albany Museum in Grahamstown for general assistance.

Messrs. Capex Limited for giving general information on the soils of the region.

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Fifthly, I owe a debt of gratitude to a large number of individuals who assisted in a variety of ways. I am particularly grateful to Professors J.V.L.Rennie and E.D.Mountain for reading the many versions of these chapters and to those of my colleagues at the Institute of Social and Economic Research in Grahamstown, University College of Swansea and the University of Cambridge who have read sections of this work and have given helpful advice; my thanks are due to them and also to Mr A.Gillies in the same connection.

I am grateful to numerous farmers, who not only granted free entry to their properties, but also willingly and at great personal inconvenience gave me much information as well as greatly appreciated hospitality. Similarly, I am indebted to the many Xhosa, and Mfengu farmers who willingly gave information to those working on the land use survey in their locations. So many individuals were involved that it is not possible to name them.

I am especially indebted to Mr Stewart Marr, for much valued guidance on agricultural matters relating to the Border, and to Dr A.W.Burton for advice on Border history; to Mr R.Tomlinson of East London and Mr D.Helen of King William's Town, land surveyors who gave much useful advice in their field, and the former of whom kindly placed office space at my disposal; and to the headman of Joseph William's Location, R.Gebe, who gave much help and information. The valuable help of Mr Enos Xotyeni, interpreter and research assistant, is gratefully recorded: he carried out most of the kraal to kraal survey of the reserves with great diligence and success.

Lastly, my thanks are due to Rhodes University; to the Council of the University for office accommodation, photographic service and other assistance; to the Institute of Social and Economic Research under whose auspices the work was undertaken; and especially to Mrs H.S.Mostert and her assistants for un-failing courtesy in dealing with exacting secretarial work; and to the Librarian of the University and officer in charge of the Cory Library for Historical Research for facilities and much valuable help.

Many helpful suggestions have been made by those at Rhodes University who kindly read through parts of the draft manuscript: Mr A.Ruddock (*physiography*) and Mr M.F.Wilkes (land use regions). I am indebted for information on the early travellers to Dr V.S.Forbes, to Dr H.H.Smith for data on

transport and to Mr M.F.Wilkes for supplying information based on his experience of the situation in native reserves.

Cambridge.
November 1960.

C.Board.

SUMMARY

This is a geographical study of land use in the Eastern Cape Province. The land use pattern, although related closely to the features of the natural environment, is perhaps even more closely related to the spatial variations of the man-made environment, particularly to the disposition of the different racial groups with their different cultures and economies, and to the kaleidoscopic character of the settlement pattern.

The "personality" of the Border region is first examined. Here are included its situation in the Union of South Africa and its relationship with the hinterland of the port of East London, the many contrasts in its landscapes, and the optimistic appraisal of its resources by early settlers. After a brief description of the relief and drainage, where some analysis of factors affecting stream discharge is attempted, there follows an account of the climate of the region as related to adjacent parts of South Africa. There is some reference to long-term trends in rainfall as well as a description of the variations in climatic elements most closely associated with agriculture and the tourist industry.

The detailed account of the growth and nature of the settlement pattern helps to explain some of the variations in land use and farming types throughout the region. The distribution of population clusters is also analysed against

this background. In the following chapter are described some of the aspects of population that vary considerably from place to place, and these are linked with the economy of the region. Some additional factors bearing on the localization of types of land use, such as planning controls established by the state, are then examined in relation to soil and veld conservation and the marketing of certain commodities.

Turning to the details of the land use distribution, each category is described separately and some reference is made to the spread of cultivation and the growing importance of crops such as pineapples and vegetables. The sources of supply for East London's milk are analysed and related to land use patterns. The final chapter treats each land use region in turn, giving an account of the associated farming.

Attention is occasionally focussed on utilization of the land in the past, particularly in the account of Bantu agriculture, where it goes far to explain the current situation. More detailed illustration of the different types of farming is provided by sample studies of single farms and estates, or of the holdings of single family groups as in the Bantu areas.

Three appendices provide further information on matters of interest to future research workers. The first gives an account of changes in the boundaries of civil divisions within the survey area. The second gives the details of legislative measures affecting land use. The third is a note on the research method which is the basis of this survey.

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Chapter 1

INTRODUCING THE BORDER REGION

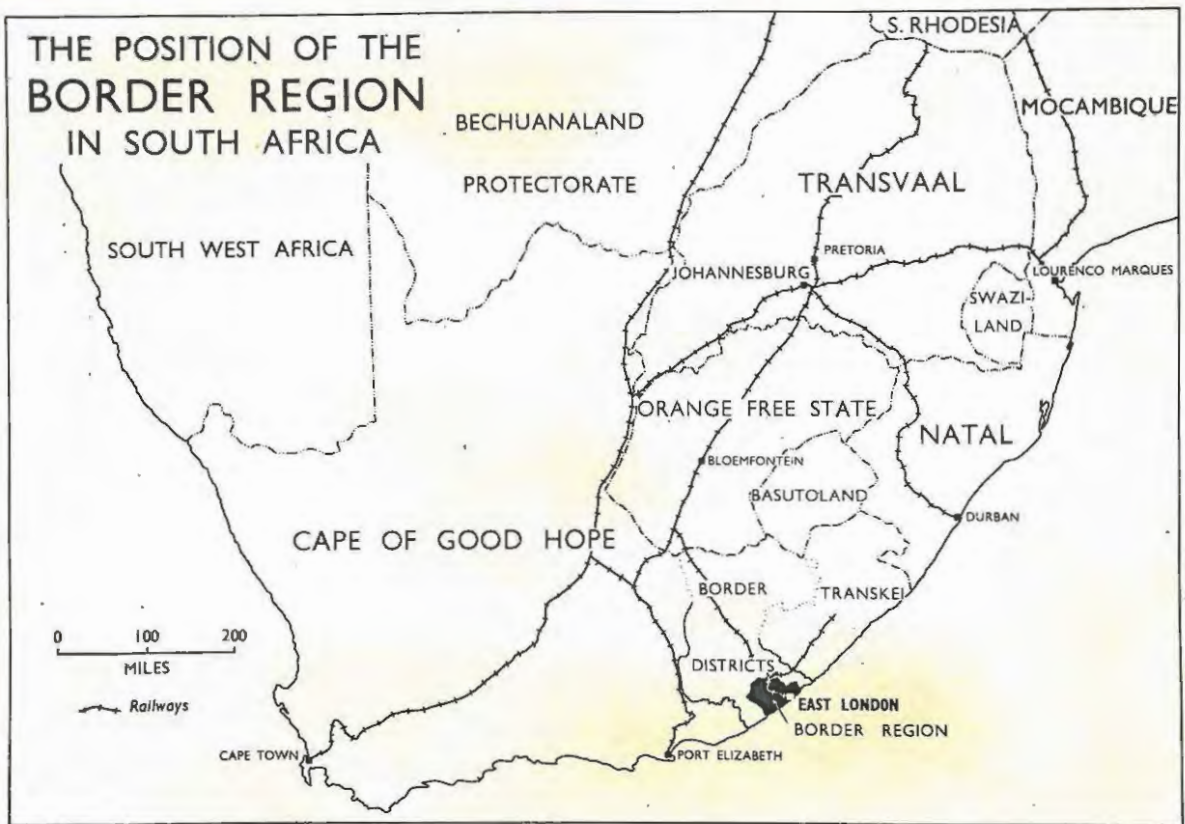
I. POSITION AND EXTENT

The survey area covers 1,547 square miles on the south-east coast of the Union of South Africa. It lies between $32^{\circ}33'$ and $33^{\circ}17'$ south latitude and $27^{\circ}08'$ and $28^{\circ}10'$ east longitude. Its widest extent is about 60 miles, roughly from west to east, and its maximum extension inland is just over 40 miles. The fairly straight coastline, running from south-west to north-east, is a little over 50 miles long.

The area is not in any sense a natural region. It occurs well below the Great Escarpment and at the eastern end of the Cape Fold Belt where the folded nature of the rocks has almost died out. It is just inside the shallow structural basin of the Karroo System and has traces of the structural features characteristic of coastal Natal. Structurally it is thus transitional just as it is transitional climatically and sociologically. The climate is broadly Warm Temperate Oceanic and falls between summer and winter rainfall types. The area lies in a transition zone between the Native Reserves of the Transkei and the predominantly White farming areas to the south-west, the population containing 30 per cent Whites.

Bantu areas comprise roughly 35 per cent of the total area of the Border Region, private and publicly-owned White occupied land making up the remainder. Of the 693 square miles of the

MAP 1



East London district only some 21 per cent are Bantu areas; whilst over 45 per cent of the larger district of King William's Town (854 square miles) are Bantu areas. (Extent of Bantu areas is given by the Tomlinson Commission, full report. Vol.8. Appendix 2. Table 4.)

There are two towns of importance, one in each of the two magisterial districts which comprise the survey area. They are King William's Town inland, with some 22,000 people, and the city and port of East London with over 93,000. The region is dominated economically and socially by East London, no part being further than 60 miles away from it.

In relation to the Witwatersrand, the economic heart of the Union, East London holds an intermediate position among the four major South African ports. Durban has most traffic with the Reef, and Cape Town has least, distance being the most important factor determining this. East London has a slight advantage over Port Elizabeth as regards distance to the Reef, but the latter has the advantage of having more extensive port facilities. With respect to the positions of the ports relative to the newly developed Orange Free State goldfields, East London is only slightly further away than Durban, and is 70 miles closer to them than is Port Elizabeth. Rail transport between the ports and places in the interior, however, is materially affected by the prevailing railway rating policy¹,

and the amount of traffic dealt with at the different ports is thus a function of other factors besides distance. The fact that Port Elizabeth is so near to East London, 130 miles by sea and 200 by road, plays a considerable role in determining the areas of the interior served by each of them, and undoubtedly influences their development. That, at the time of the survey, East London accounted for some 10 per cent of the value of imports through the four major ports, and, excluding gold, diamonds and atomic materials, about 10 per cent of the exports, is a reflection both of the above circumstances and of the extent and present state of development of its hinterland in the Eastern Cape.

For historical reasons East London and its surrounding region are part of the Cape Province, but they are remote from the provincial capital, being in fact nearer Johannesburg and much nearer Durban than Cape Town. This is one of the main reasons for the widespread influence of East London over its hinterland, an influence out of proportion to the city's size. The separatist tendencies in the eastern part of the Cape Province, caused partly by remoteness from Cape Town, are being met by the decision of the Provincial Council to open regional offices in East London and Port Elizabeth.

II. EAST LONDON AND ITS HINTERLAND

East London functions as the focal point of a hinterland within which concentric areas of varying significance may be distinguished. While the outermost of these may be taken to

extend as far as the Orange River, up to 200 miles inland, East London is not without its influence beyond that limit. It is of interest, at this stage, to compare the roles of each of these concentric areas of the hinterland, (and to look at them in connection with the differing connotations of the regional terminology of the Border as a whole).

The Eastern Cape Province can be divided into the hinterlands of the three ports, Port Elizabeth, East London and Durban, and the middle of these, that of East London, includes the Border Region in the wider sense. The hinterland of East London may be regarded as a series of shells surrounding the core area of the Buffalo River basin, which has as its nucleus East London itself, grown around Buffalo Harbour at the mouth of the river. While this core area has within it the contrasts typical of the Border Region, it includes an axis of development far more intensive than anywhere else in the East London hinterland, an axis elongated inland along the Cape Eastern railway system. The agglomeration in and around East London, and inland along this axis to King William's Town, of good communications, of water and power supplies, of considerable urban development and a local market of no small importance, together with a status in the Eastern Cape conferred on it by historical events, is the basis for regarding it as the core area.

The wider area of the two magisterial districts, which was chosen as the survey area, enclosing the Buffalo River

catchment, is termed "the immediate environs" of East London by Hobart Houghton in a companion volume to this². This wider area possesses a measure of unity, which is conferred on it by its having been the most important part of the former territory of British Kaffraria. The settlement of this area by Whites was mainly by people of British and German stock, and the majority of the Whites are English-speaking, both in the rural areas and in the two districts as a whole. The survey area is, however, truly representative of this larger territory of what was once British Kaffraria, which embraced the Komgha and Stutterheim districts, as well as some territory to the north³.

Beyond the limits of British Kaffraria is the area stretching from the Peddie coast to the Stormberg, and including the flourishing inland centre Queenstown. This area was administered as part of the Cape Colony, from its final annexation as the district of Victoria East by Governor Sir Harry Smith 1847; it has much of the frontier flavour in its isolated Bantu reserves and old military posts, and in Queenstown the term 'Border' finds expression in various ways. These areas together can properly be considered the wider area of the Border at the present day, the area being defined by Rennie⁴ as "the intervening area stretching from the official Transkeian Territory boundary to the Great Fish and Tarka rivers and at least as far inland as Sterkstroom".

PLATE 1



Evelyn Valley looking south-east from the Forest Station. The steeper slopes and inaccessible plateaux are well covered by indigenous forest. A plantation of pines on the right occupies a small plateau. The relatively open character of the plain below the mountains is in direct contrast.

East London is, however, the port and regional centre for a much wider area, the "economic hinterland" of East London, as defined by Hobart Houghton². The unity of this greater region is mainly economic, and is maintained by its chief life-lines, the Cape Eastern railway system, and the National Roads from East London to Aliwal North and to Umtata and beyond.

III. CONTRASTS WITHIN THE BORDER REGION

There is a striking dissimilarity between the various landscapes of the Border Region, as defined for the purpose of the survey. The open, treeless and close-cropped Bantu areas, dotted with huts, and with roaming herds of sheep and cattle; the rich grasslands of the pastoral farms, scattered with Acacia trees rather than huts, and with few habitations in sight; and the dark soil near the coast almost obscured by row upon row of grey-green pineapple plants indicating a high level of exploitation: these are but some of the marked contrasts readily discerned, and they are an indication of even greater differences affecting most spheres of life in the region.

In the sphere of the natural environment there are contrasts of two kinds: there are the small but significant regional differences in the climate, vegetation and soils brought about by gradual transitions; and there are the more abrupt, more frequent, local changes spread fairly evenly throughout the survey area. The latter include differences of aspect, slope and altitude, as well as of lithology and soil, such as might be found on a transect of a large valley like

that of the Buffalo River.

Superimposed on these natural variations, there is a diversity of settlement pattern that has changed with time and continues to do so. The differences in the make up of the pattern now seen, stem partly from the varying policies applied since settlement began, economic, social and strategic, and the varying local application of these. Settlement of the area has, of course, been made by peoples at very diverse cultural and economic levels, both at the time of the original settlement and subsequently. One of these peoples, the Bantu group, occurs as a self-contained tribal society of primitive character, whose members were relatively unskilled at agriculture and carried out only the most simple manufacturing. The other major group, the White settlers, included many persons skilled in agriculture and manufacturing, within a complex society, stemming from and at all times linked with the civilised world of Western Europe, while the more enterprising amongst them established the foundations of commerce with the world in general.

The presence, in this relatively small area, of these two main population elements, has thus in turn led to the growth of separate, contrasted yet interdependent economies. These have a scattered distribution in the two districts comparable with a mosaic, the main elements of which, farms, reserves and towns, occur intermingled. The co-existence of these three interdependent economies has resulted, in the rural sphere, in



A view of the Pirie Mountains: West Peak Pirie (extreme left) to Mount Kempt (extreme right). The flat tops and the Bailie's Grave plateau are clearly shown, and the cliff below is MacNaughton's Krans. The wooded nature of the mountains is relieved by small, grassy glades (left). The open plain beneath is occupied by Bantu tribesmen of Izeleni Location. Several imizi (kraals) can be seen characteristically placed with the cattle kraal below a group of huts.

a great diversity of land use and farming type, a diversity that can be traced primarily to the different origins and cultural traditions of the people, the character of land tenure including the sizes of farms, as well as to the variability of the natural environment.

IV. THE BORDER REGION IN PERSPECTIVE

There are few, if any, regions in the Union of South Africa that can be said to be highly endowed with a full range of natural resources, and the survey area is no exception. It is poorly off in relation to some areas in the Union, which have economic minerals in abundance, a more reliable rainfall, or a better position. The Border Region in fact is far from being a land of great promise, and one cannot agree with the Reverend William Shaw⁵ who wrote in 1860:

"Those who are well acquainted with this part of the earth will not think that I exaggerate when I say it is 'a land flowing with milk and honey'. Nay, I am sure that the more extended description of the earthly Canaan will be found literally applicable in describing the capabilities of this country".

Equally unacceptable are the similar views of his contemporaries, who buoyantly stated their opinions on the resources, and on the possibilities of development, of the Border Region. For example, we find the editor of the King William's Town Gazette⁶ writing as follows:

"British Kaffraria consists of a tract of land which, from its natural advantages, is unequalled by any other portion of this extensive country from the Equator downwards. Possessed of plentiful supplies of wood and water; superior pasturage and a soil in which the most

valuable products thrive to perfection, the greatest inducements are offered to the enterprising agriculturalist."

Views such as these were given credibility by the generosity of the Imperial Parliament in conferring Crown Colony status on British Kaffraria in 1860, and by the occasional, good harvest at about that time.

The Border Region passed successfully through the stage of early disillusion created by the trade depression of the 1860's, and by bad harvests in the earlier decades. It has become reconciled to life-long rivalry with the three other main parts of the Union, serving the hinterland of the sub-continent. It became known as the "Fighting Port"⁷ when seeking to gain facilities comparable with them, emerging as the Cinderella of this group.

It is hoped, however, that the evidence presented in this, and in companion volumes, will provide a basis for a new spirit of orderly development, founded on a proper and thorough realization of the short-comings of the area, and on the best methods of exploiting local advantages. Nevertheless, it must be remembered that, although the natural basis of development may seem to be immutable, the trend of development could in fact be changed rapidly, by any reappraisal of the situation stemming from government policy and reflected in its local implementation, or by reactions in world markets. More slowly, it could be changed by the improvements in the attitudes and skills of an increasing population.

What long-term effect on the region will be achieved by the implementation of schemes for the establishment of separate racial areas, under the Group Areas Act of 1950, is difficult to determine. The projected scheme⁸ published in 1958 may simplify the economic patterns of the area, but separate residential areas alone may not do much to break down the inter-reliance of the three inter-dependent economies of farm, reserve and town. The recently reasserted policy of bringing industries to the borders of the Bantu reserves⁹ could also have some important influences on the future development of all parts of the Border, as the Ciskei is one of the areas in which it is intended to establish industries in conformity with this policy.

REFERENCES TO CHAPTER 1

1. See Smith, H.H. Economic Development in a Plural Society Appendix F, p.361.
2. Hobart Houghton, D. Economic Development in a Plural Society p.8.
3. See Appendix 1, Boundary changes in the area of the former British Kaffraria.
4. Rennie, J.V.L. 'The Eastern Province as a Geographical Region' South African Geographical Journal, 27, 1945. p.27.
5. Story of my Mission, London 1860, pp. 403-4.
6. King William's Town Gazette, 21 April 1860.
7. Smuts, J.C. Message to East London Centenary Executive Committee, East London Centenary 1848-1948, p.5., and
Burton, A.W., Sparks from the Border Anvil, King William's Town, 1950, pp.147 and 158.
8. East London Daily Dispatch, 28 November 1958.
9. The establishment by the Government in 1960 of an Economic Advisory Council, with a very representative membership, appears to be largely directed towards this objective.

Chapter 3

RELIEF AND DRAINAGE

I. PHYSIOGRAPHY

(i) General features

The study of physiography is concerned with the kinds and distribution of land-forms, and is an essential part of the more general geographical relationships of any area. While an examination of land-forms inevitably leads to problems of great academic interest, it is not the purpose of this study to attempt to solve questions on the origin of such features, but rather to concentrate on those aspects which bear some relationships to the pattern of human activities in the area. In this way geological and physiographic features are considered in the light of a background to the drama of human development.

Perhaps the most striking physiographic feature of the region is a high mountain area exceeding 4,000 feet above sea level at a distance of less than 40 miles from the sea. Such an abrupt rise from sea level is a quite local feature, and is not encountered again within a distance of a hundred miles or so along the coast in either direction. The presence of this high mountain mass implies the existence of relatively short rivers, compared for instance with the Great Kei River, which to the immediate north-east of the area has carved out a huge basin penetrating far inland behind the mountains falling into the area. This, in turn, means that much of the area is

provided with a substantial source of water as relatively heavy rainfall in the mountains.

This mountain area occupies at most about 15 square miles of the survey area, and occurs along the north-western margin. At the beacon West Peak Pirie 4,170 feet shown on the contour map, this high tract represents the southern end of a range running 12 miles southwards from Mt. Thomas 5,301 and including Bailie's Grave at 4,420 feet. Mt. Thomas is a well-known feature of the landscape situated at the eastern end of the Amatole Mountains, which include such lofty points as the Hogsback Mountain and Geju Mountain rising to well over 6,000 feet, so that the ridge extending to West Peak Pirie can be regarded as an offshoot or extension of the Amatole Mountains. That portion in the survey area is locally referred to as the Pirie Mountains and, in turn, it gives off another ridge running along the northern margin of the area and known as the Dongaba (or Donga) Range at about 3,000 feet. As the drop to the north of this ridge is slight compared with the steep fall into the headwaters of the Buffalo River tributaries in the survey area, the Dongaba Range is more in the nature of a local escarpment.

Between this mountain area and the coast, and occupying the remaining 99 per cent of the land area of the map, is a broad belt of lowland country sloping gradually from about 3,000 feet to the sea. In the adjacent area to the south-west, the corresponding belt has been called the coastal plain in

PLATE 9

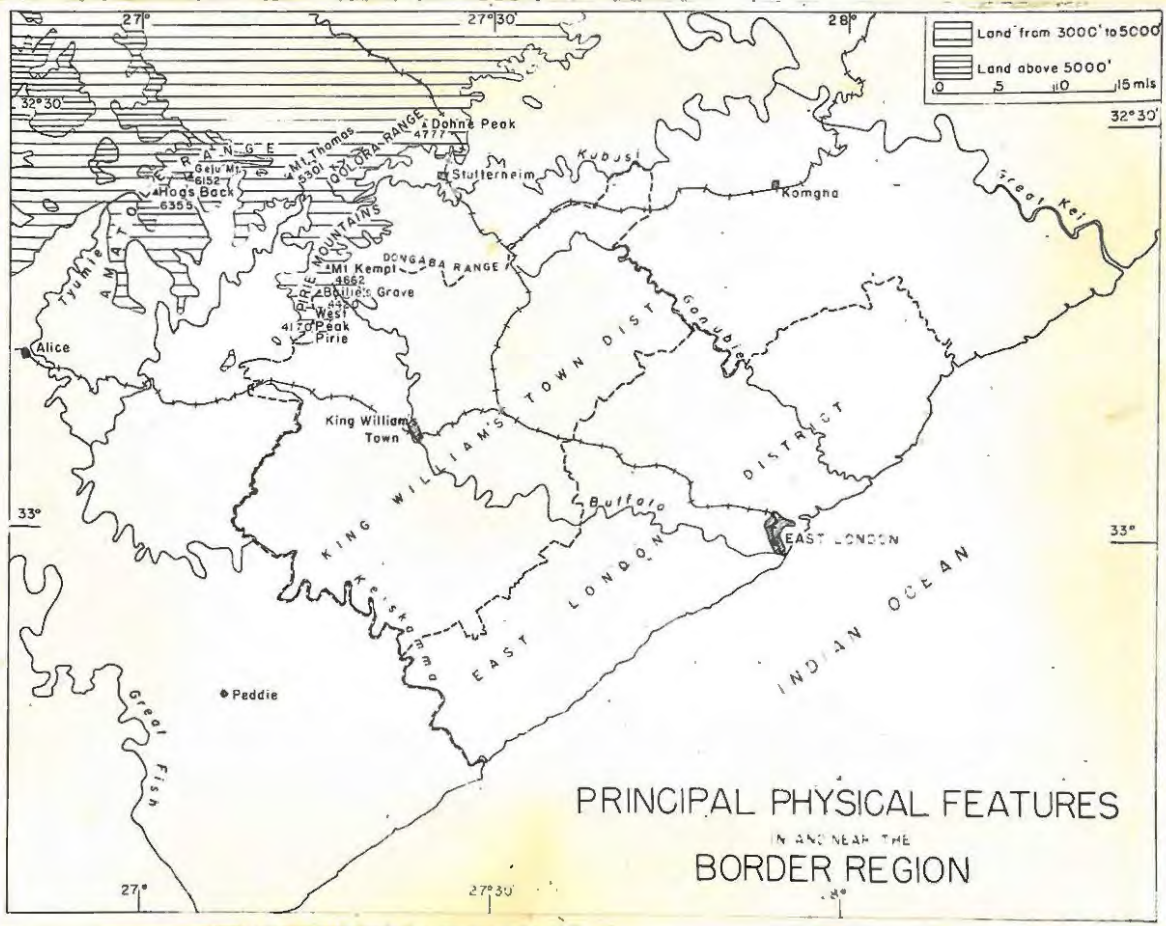


Ravine near the Keiskamma River valley showing bands of sandstone in a krans overlooking the river, which is deeply incised below the level of the open spur on the right. The vegetation of the valleys is xerophytic scrub with numerous Euphorbia trees. Above this is a zone of over-grazed veld with Pteronia, and in the foreground scrawny sheep graze on sweetveld in which trimmed shrubs can be seen. Dube Location looking north-west.

view of the fact that it is a plain sloping continuously down to sea level, and in the preceding chapter the use of the term coastal plain has been extended to the survey area. It must, however, be emphasized that this plain has been highly dissected by all the rivers flowing across it, and that within a distance of some 4 miles from the sea the coastal plain surface is in part obscured by low hills built upon it. As mentioned in the preceding chapter, the coastal plain surface has a somewhat variable slope seawards and in particular shows a very appreciable increase in slope below 1,000 feet. The average slope, however, from the 3,000 foot contour to the coast is 84 feet per mile. The increase in the slope below 1,000 feet is one of the factors used in dividing the lowland area into two **physiographical** regions which will be referred to as the inner and outer coastal belts respectively.

Most of the drainage of the survey area originates within the area. The Keiskamma River, however, which forms the whole of the south-western boundary, has its source near Mt. Thomas, and has probably completed half its course before it first becomes the boundary. At this point it is joined by a tributary, the Mdizeni, which for some 15 miles forms part of the north-western boundary. The Kwenxura River, which forms the seaward part of the north-eastern boundary, rises some 4 or 5 miles outside the area, and another river, the Kwelera River about 8 miles to the south-west, rises well outside the

MAP 2



area in the neighbourhood of Komgha which is shown on the maps of scale 1:125,000 of the area. Of the rivers rising in the area, the Buffalo River is by far the most important with both King William's Town and East London situated on it. The Gonubie (Gqunube) River, which comes next in importance, forms part of the north-eastern boundary to the area for 15 miles. The remainder of the boundary lies on watersheds except in the extreme north where the area extends rather surprisingly down to the Kubusi River, a tributary of the Great Kei River.

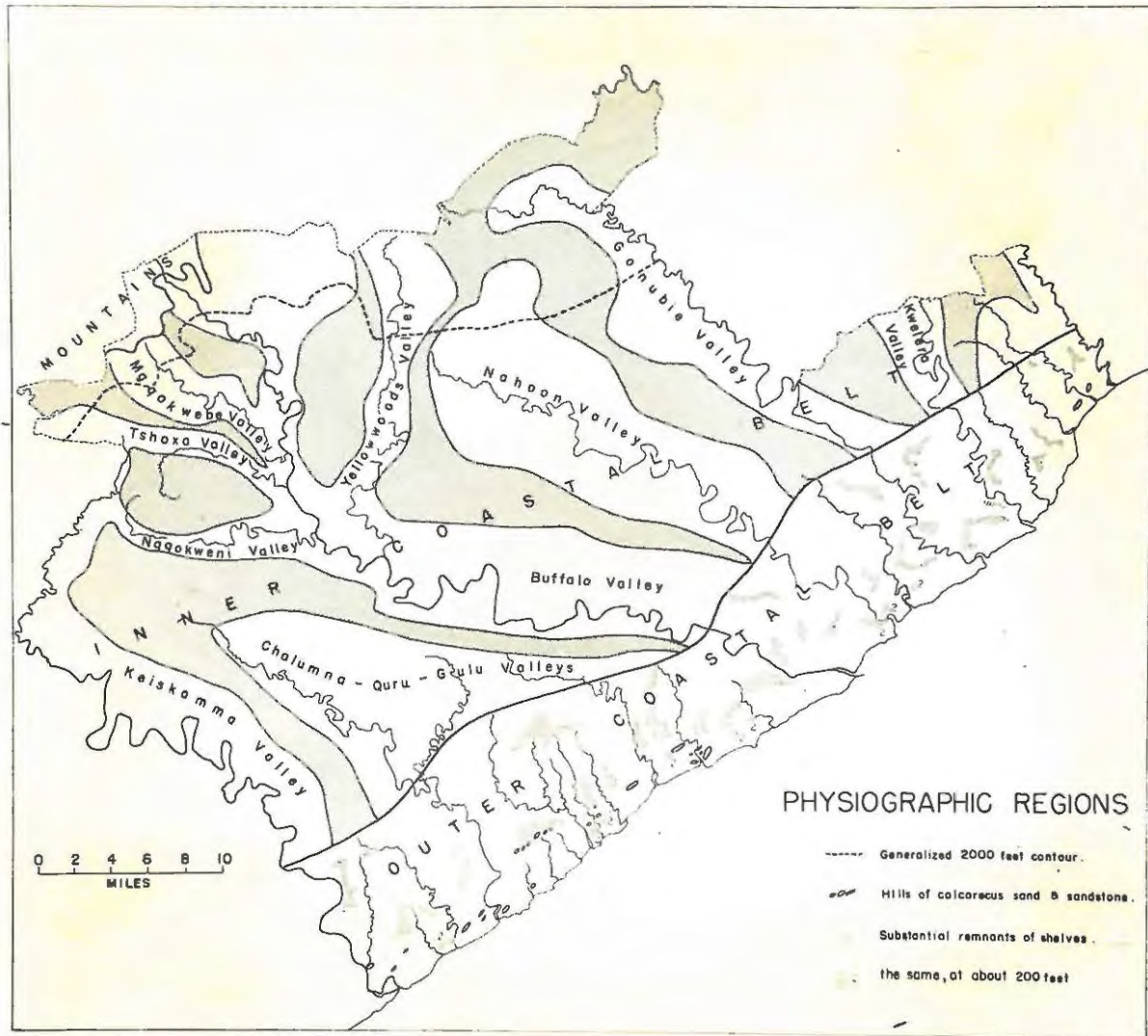
(ii) Physiographic regions

(a) The mountains

As stated previously, the mountains along the margin of the area above 3,000 feet are known as the Pirie Mountains and may be regarded as an extension of the Amatole Mountains which form the watershed of the Keiskamma River. They are characterized within the area by their great altitude and by the steep drop down to the plain below. At the summit of the mountains are several small flattish areas carrying a grass cover or bush. The highest points in these Pirie Mountains are Mt. Kempt (4,662 feet), lying just outside the survey area, West Peak Pirie and Bailie's Grave. The last-mentioned is situated on a small plateau at 4,420 feet and is the highest point of the survey area.

In general the steeper slopes are heavily forested but, in places, these slopes become almost vertical with the

MAP 3



development of bare rock cliffs up to 400 feet in height. Such cliffs are conspicuous in the headwaters of the Buffalo River above the Maden Dam and a typical example is shown on the geological map as Murray's Krans. The height of these cliffs, which is actually exceeded in the adjoining Keiskammahoeck district, diminishes eastwards within the Buffalo River basin. Below the cliffs the surface is often strewn with large dolerite and sandstone boulders which render this terrain useless for cultivation or roads. Moreover, only a small proportion of the slopes are gradual enough for the plantation of timber, and much of the indigenous forest has remained unexploited because of the difficulties of access to the remoter kloofs.

(b) The inner coastal belt

As mentioned earlier, the whole of the Border Region, with the exception of the mountains which occupy only 1 per cent of the area and a narrow belt at the coast where the seaward slope of the land surface increases appreciably, is referred to as the inner coastal belt. The narrow belt at the coast which is called the outer coastal belt may be taken to lie below the 800 foot contour on the coastal plain surface so that its average width is about 6 miles and it covers about 20 per cent of the Border Region. The inner coastal belt therefore occupies about four-fifths of the total land surface and corresponds to a range of altitude between 800 and 3,000 feet on the coastal

plain surface. Owing to the doubt as to whether the surface of this inner belt is essentially wave-cut or subaerial in origin, objections have been raised to the use of the term coastal plain, which generally implies a marine origin, and the alternative term coastal peneplain has been used and very approximate contours have already been determined between the Keiskamma and the Buffalo Rivers. Recent maps, however, have made possible a much more detailed study. It should be mentioned that there are objections to the use of peneplain for the whole surface down to sea level if the term peneplain is inapplicable to a marine-cut surface.

The upper portion of this belt lying above the 2,000 foot contour retains very little of the original coastal plain surface owing to the widespread headstream erosion of the Buffalo and Nahoon Rivers and their tributaries, so that the actual distance between the 2,000 foot and 3,000 foot contours on the map below the Pirie Mountains is little more than one mile. Further east, however, beyond the Nahoon River, the original surface is in places fairly complete so that on the map the area between the contours spreads out beyond Kei Road to a width of about 10 miles. The average slope of this surface is about that of the average for the whole coastal plain measured in a direction at right angles to the coast-line. The surface rises to such heights as 2,794 feet at Gonubie Hill and 2,983 feet at Hangman's Hill (Frankfort).

This rather flat area around Kei Road can be distinguished to some extent from the rest of the inner coastal belt by the fact that it is not traversed by any valleys. This is the same as saying that only the largest rivers such as the Great Fish, Keiskamma and Kei have become incised into the coastal plain further inland than the 3,000 foot contour on the plain. It is demarcated from the remainder of the belt on the map of **Physiographic Regions**, and the re-entrant to the north-east of Kei Road is due to the upper reaches of the Gonubie River.

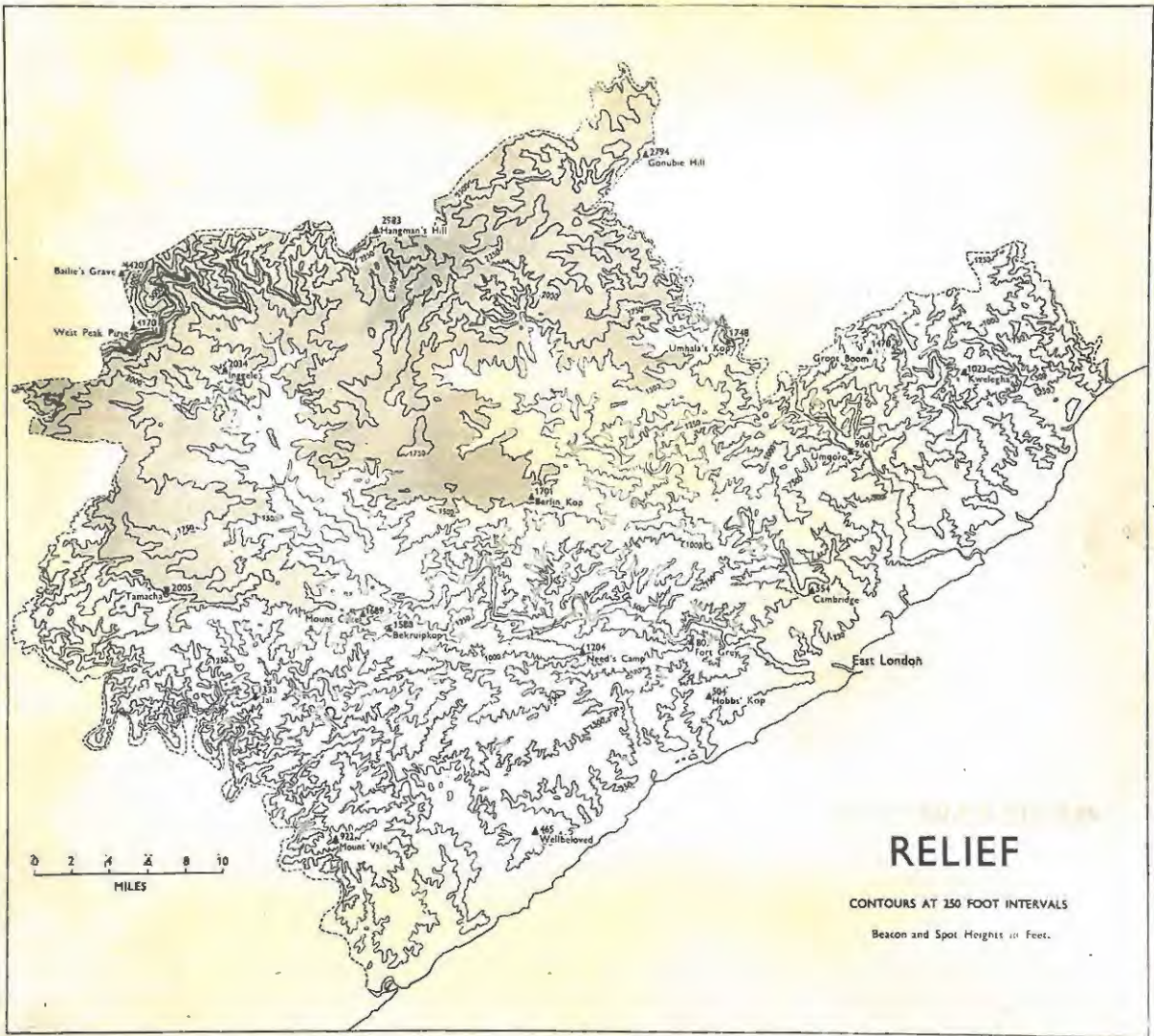
The remainder of the inner coastal belt, corresponding to the range of altitudes on the coastal plain between 800 and 2,000 feet is a typical dissected plain. While local variations in the slope of this plain do occur, the average slope between the 2,000 and 1,000 foot coastal-plain contours is only 64 feet per mile, less than the average for the whole plain. This surface is dissected by a series of valleys, of the rivers Chalumna, Buffalo, Nahoon, Gonubie and Kwelera and their tributaries, as may be readily observed by reference to the maps of **Physiographic Regions** and of **Drainage Pattern**. These rivers have carved valleys to various depths and of various widths, traversing the area in a direction roughly at right angles to the coast line. A traverse through this area parallel to the coast line thus consists of alternate valleys and flat-topped interfluves.

Within this major part of the inner coastal belt certain

progressive changes can be observed to accompany the general drop in altitude. In the upper part the valleys are not very deeply incised, perhaps on the average some 200 feet, and these valleys are often rather broad open features with rivers meandering on their own flood plains as in the cases of the Tshoxa and the upper parts of the Buffalo and Yellowwoods Rivers. They are separated by rather extensive areas of the coastal plain surface such as occur around Debe Nek and Berlin. Such areas are exposed and windswept, and offer a rather striking contrast to the protected valleys which dissect them. It may be noted that the coastal plain surface in this belt differs in one important respect from the corresponding surface further south-west in the Albany and Bathurst divisions, where extensive areas are covered in a thin capping of silcrete. In contrast to this there occur, just south of the Buffalo River in the neighbourhood of the Laing Dam, three isolated flat-topped koppies capped with silcrete and described in the chapter on geology. Their summits are presumably remnants of an earlier peneplain subsequently reduced to the present surface.

As the valleys are followed toward the coast they are found in general to become more and more deeply incised below the level of the coastal plain and reach a maximum depth of about 900 feet where the coastal plain is between 1,000 and 1,500 feet above sea level. For example the Buffalo River at the Laing Dam plunges rather suddenly into a gorge which

MAP 4



continues with interruptions for the rest of its course. It will be noticed that the river in this section does not meander on its own flood plain, but that the meanders are deeply incised. Especially on the concave banks there are generally high cliffs, and such situations are of course avoided by roads crossing the river. In places the valley is much more open on its upper slopes and, in fact, there are many valleys with valley-side shoulders indicating a valley-in-valley form. In the valleys of the Keiskamma, Chalumna, Nahoon, Gonubie and Kwelera Rivers, these shoulders generally lie about 200 feet below the coastal-plain level.

At the same time as the rivers become more deeply entrenched with approach to the coast, so the amount of un-eroded coastal-plain surface becomes reduced, and it generally appears as rather narrow flat-topped ridges. This endows the landscape with a characteristic appearance which tends to differentiate it from the broad flat areas further from the coast. This phenomenon appears to be connected with the convergence of the Buffalo and Nahoon Rivers and to the appearance of the Chalumna and other streams in the lower part of the region, both of which have been responsible for eliminating much of the coastal-plain surface.

(c) The outer coastal belt

Between the inner coastal belt just described and the sea is a narrow belt distinguished in several ways from the

inner belt. It is about 6 miles in width, and as stated earlier the coastal plain, as it approaches the sea, becomes steepened in its seaward slope. The inner margin is taken as the 800 foot contour on the plain, but there is no precise level where steepening begins. For altitudes on the coastal plains the average slope from sea level to 500 feet is 122 feet per mile and from 500 feet to 1,000 feet 87 feet per mile. This belt is characterized by shelves, with lesser slope and landward scarps, which are commonly up to a mile or so in width, and which are particularly common at about 200 feet. They are shown on the map of Physiographic Regions. A third feature of this belt is the occurrence of hills, often aligned almost parallel to the coast and rising to a maximum height of nearly 500 feet near the Chalumna River mouth. As explained in the chapter on geology, these hills are formed partly of marine deposits, and indicate that the belt has been submerged beneath the sea in geologically recent times.

Another characteristic feature of this belt is the nature of its drainage. The rivers flowing over the inner belt continue to be deeply incised but rapidly emerge to some extent from their deep valleys as they traverse the outer belt. They tend to travel in straighter lines, roughly at right angles to the coast line, and in this belt they have very few tributaries. At the same time new streams tend to rise near the inner margin of this belt, and to follow relatively shallow

PLATE 10



The mouth of the Gulu River showing the tidal lagoon and salt marsh. The dunes fringing the coastline are seen to be covered by bush except for a few isolated patches where white sand is exposed. Valley bush characteristic of the coastal area is shown on the right.

valleys direct to the sea without joining the major rivers. This feature can be observed on the map showing the drainage pattern.

Shelves can be observed at about 650 feet above sea level at Lilyfontein, and on the watershed between the Cefane and Kwenzura Rivers. The Collondale airport has been constructed on a shelf at about 400 feet and other shelves at this height can be observed south-west of the Ncera River and between East London and the Kwelera River. Shelves at about 200 feet can be recognized at Nahoon Mouth and beyond the Qinira River, at Cove Rock and Christmasvale, and in these places cultivation is generally protected by windbreaks of eucalyptus, Napier fodder or sugar-cane.

A distinctive feature of the actual coastline, following most of its length in the survey area, is the belt of dunes carrying characteristically wind-swept vegetation. The dunes are elongated south-west to north-east, slightly oblique to the coast, and are often used as landmarks by shipping. The dune bush preserves the height and contour of the dunes at anything from 100 to 275 feet, and between these fixed dunes and the foreshore there is frequently a belt of bare dunes. In the Cove Rock area these latter take the form of ridges about 10 feet high at right angles to the coast¹ and their alignment and altitude are presumably controlled by the prevailing strong south-westerly winds. Quite often in this belt the

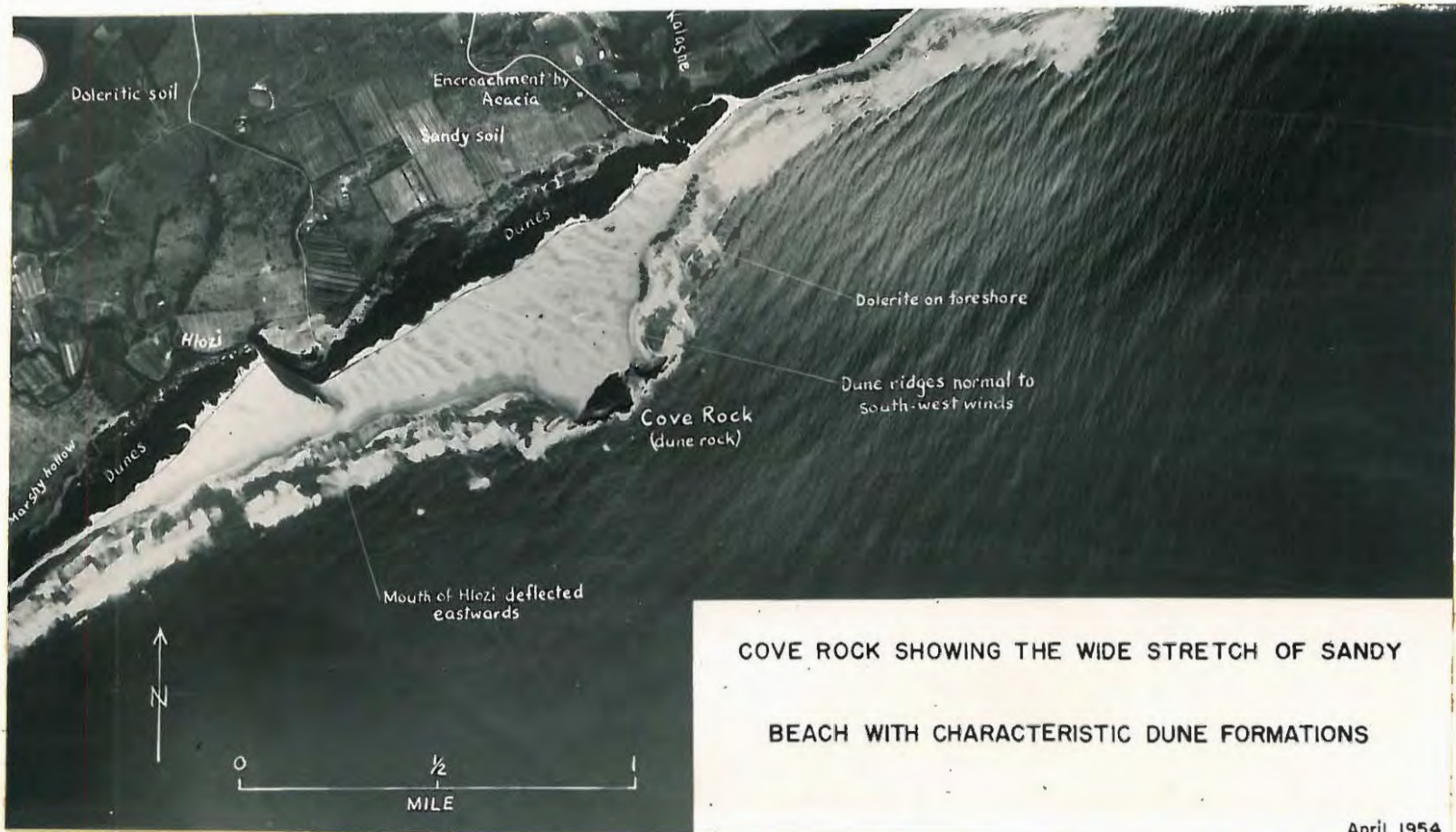


PLATE 11

dunes have the effect of diverting the mouths of streams to the east. Good examples of this near Cove Rock are the Hlozi, Kalashe and Hickman's Rivers, which all reach the inland side of the dune belt some distance west of the points at which they break through to the sea. Sand bars which are usually covered by the sea only at spring tides prevent free access to all the estuaries along the coast. After exceptional falls of rain, as in 1848², and on other occasions such as in September 1956 when 5½ inches of rain fell in six days onto a drought-stricken and hard soil in the hinterland, the bars at the river mouths are swept away. They soon begin to form again, but the lagoons, like the one at Gulu mouth, are drained for a time and then present a most unfamiliar sight. An account of the coast would not be complete without the mention of the nearly isolated Cove Rock and the rocky reefs which extend from the coast up to a quarter of a mile at Christmas Rock, Hood point, Nahoon Point and Reef Point. The estuaries of rivers are generally steep-sided features, with the tidal water normally reaching the flanks of the valley, but in a few instances there are small patches of alluvium not entirely covered at high tide. The tidal mud sometimes forms a salt-marsh, and the drier areas are sometimes cultivated.

Little is known of the submarine contours off the coast of the Border Region and adjacent areas. There is a drop to the 40 fathom isobath in about 3 or 4 miles from the coast, but

PLATE 12



Rooikrans Dam and West Peak Pirie. Forest clad slopes contrast with grassland on the level plain below.

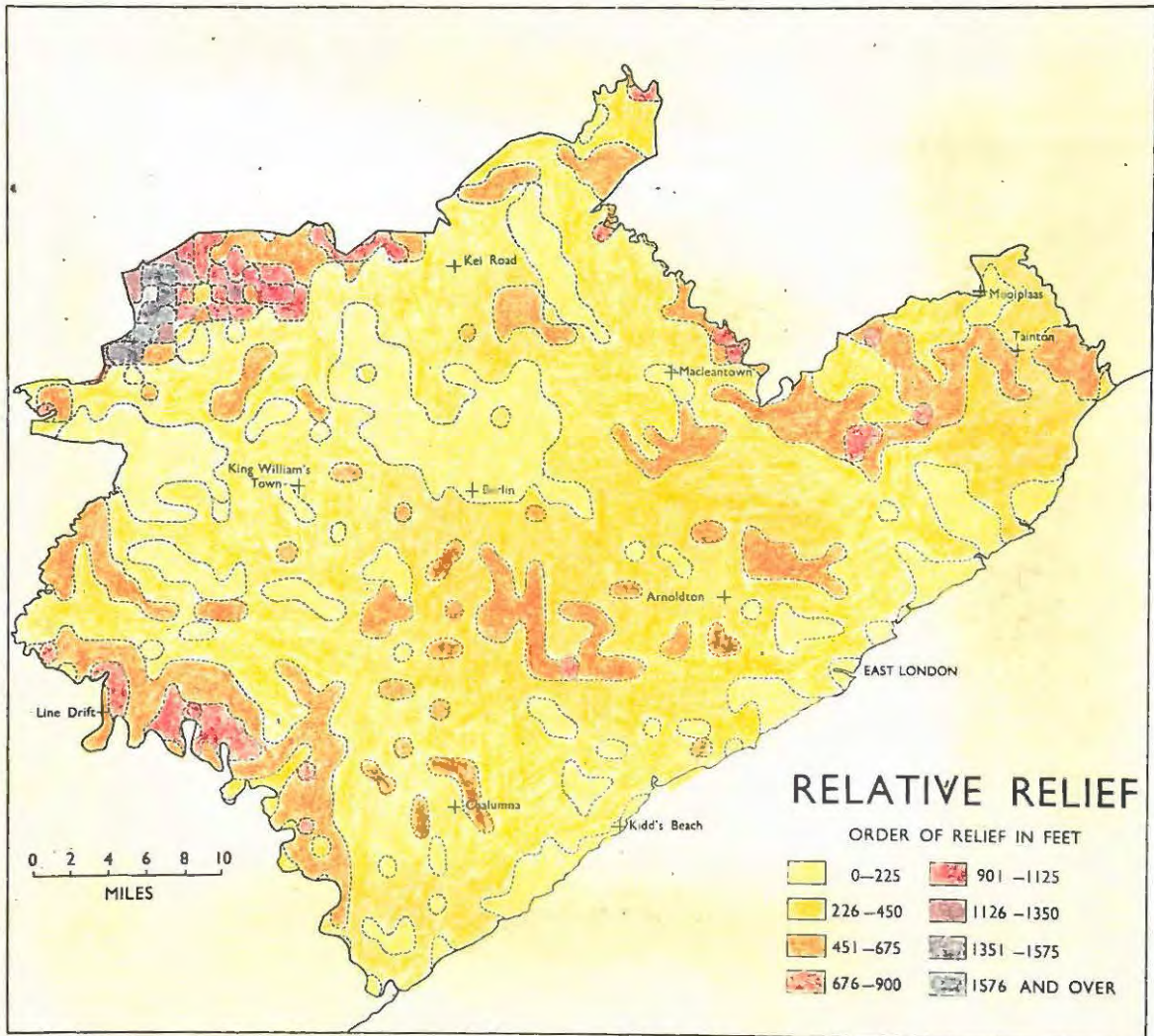
between this line and the 50 fathom line is an area which is sometimes slightly less steep. In some places the shelf between 40 and 50 fathoms (240 to 300 feet) is indented opposite the mouths of large rivers such as the Buffalo/Nahoon, Chalumna, and Keiskamma.

(iii) Relative relief

The aspects of physiography chiefly affecting the economic development of the area are altitude and slope. The influence of altitude is felt mainly through the agency of climate, while slope has a direct effect on run-off and on the soil. As stated previously, the larger part of the area is highly dissected, with the result that much of the region has steep slopes. In order to convey the regional pattern of slope variation, a map of relative relief was prepared³. This shows indirectly the average slope by portraying the differences in height between the lowest and highest points of small areas⁴ and the values thus obtained give the relative relief of the small area. The accompanying map clearly shows the areas in which there are great differences in height (steeply dissected) and those in which there are small differences in height (flatter areas).

The mountain region stands out at once as an area with great relative relief. Differences of altitude characteristically exceed 700 feet, and may rise to over 1,600 feet. The plateaux at the summits of the Pirie Mountains are in

MAP 5



contrast indicated by low values. Run-off in the mountains would be rapid were it not for the dense cover of indigenous forest here. Towards the east, along the Dongaba Range, relative relief is slightly lower, but the vegetation cover of grassveld lends itself to more rapid run-off. Slopes have been steepened by the headward erosion of streams tributary to the Buffalo River. The small amount of cultivation in these areas is, because of the relief, liable to lead to serious soil erosion if not properly controlled by contour terraces.

It is readily apparent that belts of high relative relief occur along the lines of the major valleys, particularly in the seaward part of the inner coastal belt. This is the point at which these rivers become most deeply incised into the coastal plain surface. As a result the valleys are more difficult to cross here, and farms are less capable of easy development on account of the steeper ground. At the same time many such sections of these valleys are still well covered by forest or bush. In the Keiskamma River valley relative relief exceeds 700 feet more often than anywhere else in the survey area, apart from the mountains.

The coastal plain surface, where shallowly dissected by numerous streams tributary to the main valleys, has on the average a relative relief of between 250 and 450 feet. This provides a variety of aspect, good drainage and usually plenty of shelter for livestock. The extreme east of the inner

PLATE 13



New factory sited on a flat part of the coastal plain on the west bank of the Buffalo River. Across the entrenched course of the Buffalo River is seen the city of East London under a cloud of smoke blowing before a south-easterly wind. June 1956.

coastal belt, although not traversed by main river valleys, has a greater relative relief than most other parts. In this area small properties which are composed mostly of steep slopes are largely unsuitable for cultivation, except on the scale suited to sub-tropical fruit gardens, which do well in sheltered nooks between Mooiplaats and the coast.

The most extensive areas of flat land, with relative relief of 225 feet or less, occur on the largest remnants of the coastal plain surface in the neighbourhood of Debe Nek, between Frankfort and Berlin, and east of Kei Road. These are locally known as flats and, because of their altitude (above 1,500 feet) and exposed position, are some of the most wind-swept country in the survey area. There is little indigenous woodland on these flats, which consequently provided open country ideal for travelling a century ago. On the other hand although this type of country is easily cultivated, crops are exposed to wind damage. The open and flat nature of the country is inhospitable to sheep, especially in the changeable weather of spring and autumn.

The other extensive areas of flatter land are found along the coast between the larger rivers. Here again the exposure of cultivated land to winds necessitates special protection for crops. Many of the flatter areas are associated with the shelves previously mentioned.

II. HYDROGRAPHY

(i) Drainage pattern

The following account is an attempt at an analysis of the drainage pattern in the Border Region and adjoining areas. The Buffalo River basin is the largest single catchment in the Border Region, and, lying in the centre of the region and supplying water to its two largest centres of population, it is undoubtedly the most important. The Buffalo's straight estuary, free of rock barriers, has been used as a port continuously since the War of the Axe in 1846, although dredging and many other harbour works have been necessary to keep it in use. The river is tidal for 6 miles only, and navigation is soon blocked by rock bars upstream from Green Point. The Buffalo River is typical of all the larger rivers of the Border, which are obstructed beyond the tidal limits by rock bars. Besides the Buffalo only the Nahoon and Chalumna basins are entirely within the Border Region. Parts of two other large river basins, the Great Kei (Kubusi) and the Keiskamma, also fall within this region, as do most of the Gonubie and parts of the Kwelera and Kwenzura systems⁵.

The longer, main rivers with larger catchments are in general better adjusted to the geological structure of the area. They possess components which are inclined to the general fall of the country towards the coast, or are parallel with the major dolerite sheets and the general strike of the rocks. It is

plain that the lower stretches of even the main rivers have a consequent character, in that they are straighter and flow more directly to the coast than their upper courses. This is well illustrated by the Keiskamma River below Ebb and Flow, by the Chalumna River below the Police Station, and by the Gulu River. The Gulu River has a remarkable course, which drains a fairly wide area south of the Needs Camp ridge, until at a point on the common boundary of Farms 64 and 43 it turns sharply southward, receives the tributaries Duluca and Ntsanyana at right-angle confluences, and then plunges into a gorge some 5 miles long, and finally flows into a lagoon where the waters of the Mgwenyana and Shumani meet it. The gorge and the two parallel streams, the Mgwenyana and Shumani, are typical of the short, parallel and closely-spaced streams which have probably arisen on an emerging coastal plain. This phenomenon is repeated in the Ncera basin, by the Mlele and Mkantsi Rivers, and on the other side of East London by the Dwadwa, Bulura, Cintsa and Cefane Rivers. Another major influence in the development of stream patterns in the coastal area is the dune belt and the occasional calcareous sandstone hills behind it. In the case of the Gulu and the Ncera basins, they have almost certainly diverted the direct drainage from the Mgwenyana and Shumani into the main Gulu River, and the upper Ncera, Ducani and Nunu into the direct Mgwenyana - lower Ncera.

The drainage of the country behind the outer coastal belt

is performed by five principal rivers - the Keiskamma, Buffalo, Nāhoo, Gonubie and Kwelera Rivers, and to a more limited extent by the Chalumna and Kwenxura Rivers. The small area drained by the Kubusi into the Great Kei River raises the possibility of considering capture by the former of the upper drainages of the Gonubie and Kwelera Rivers in particular. The fact, however, that part of the Border Region does lie in the Kubusi basin has led to the overlapping of the Upper Kabousie Soil Conservation District with the King William's Town magisterial district, which has included Farms 35 and 36 amongst other properties since 1898.

In general the main rivers tend to keep closer to the watershed on their right banks, so that their left bank tributaries are longer. This may possibly result from the greater ease of headward erosion of the tributaries back along the regional dip in a northerly direction. Both the Chalumna and the Buffalo Rivers exhibit this tendency to a marked degree. The lowest long right-bank tributary of the latter enters it above the Laing Dam. It is noticeable that the tendency to hug the south-western side of their basins is more prevalent in the middle courses than in the headwater region. The Chalumna and Kwenxura river basins do not reach further inland than the middle course stretches of the larger rivers, and have a pattern more typical of these latter. This pattern is characterized by the dominance of the main stream in a fairly

narrow catchment area, and by roughly parallel tributaries which have eroded back more on the left bank than the right. Some of these lateral streams may have been assisted by other advantages such as a well developed joint plane, a fault or weaker rocks. The general direction of the middle courses of the rivers appears to be broadly related to structure, since the Buffalo and Nahoon Rivers run between watersheds largely controlled by resistant dolerite. The Gonubie and Kwelera Rivers run more directly to the coast, and are not hemmed in by ridges of dolerite.

The headwater areas of the main rivers have a broadly dendritic pattern with tributaries from both sides joining the principal stream. The Yellowwoods River has managed to preserve its identity longer than most upper tributaries, and in this respect resembles the upper Keiskamma River, which joins the Tyumie River after a long independent course of over 40 miles. Initially the main north-south components of the drainage were developed by headward erosion of the advancing cycle of erosion down the regional dip. The shorter, more steeply graded, headwaters often cut across the structural outlines of the area, breaching quartzitic sandstones and dolerites until they erode back to the thick dolerite sheets of the Pirie Mountains. The dendritic pattern of the upper Buffalo, Nahoon and Gonubie basins is at a stage where major tributaries have formed small valley-floor plains up to a mile

wide in places. In the Buffalo River valley, these tributaries are the Tshoxa, Mggakwebe and Yellowwoods. It is also clear from the evidence in certain localities, that the enlargement of catchments is taking place by river capture. The most common process of capture seems to be the extension of the right bank tributaries by headward erosion, thus picking out the general strike of the rocks, so that eventually even the headwater areas will be adjusted to structure. The Nahoon River would appear to have beheaded some minor tributaries of the Yellowwoods River immediately east of Peelton, and to be well on the way to capturing the whole of the upper Yellowwoods above Peelton. At a distance of half a mile on either side of the watershed at Peelton Station, the Nahoon River is rapidly eroding at 1,550 feet, whilst the Yellowwoods River flows sedately through an alluvial plain at 1,700 feet. It is easy to see that the stream which has the advantage of the shorter distance to the sea and thus greater erosive power is the Nahoon.

Not all the east-west flowing tributaries, however, have erosive advantage. It is apparent that the Mdizeni, with the advantage of a short course to the larger Keiskamma River and the ocean, has been able to behead the Ngqokweni and the Tshoxa. The Green River is aligned with the head of the Tshoxa, and there is a remarkable col north of Ntsikizini Post Office which may once have carried the headwaters of the

Ngqokweni before capture. Just here the Mdizdani crosses a knick-point plunging 250 feet in $1\frac{3}{4}$ miles.

(ii) Run off

Only the principal rivers of the Border are permanent. Typically the shorter rivers are, in dry seasons, a series of pools separated by rock bars and pavements of various lengths, depending on the outcrop of resistant rock, sandstone or dolerite, at those points. Occasionally in the driest years the permanent rivers cease to flow, and the water in the pools stagnates. In the past 20 years the Buffalo River has run dry twice, in the winters of 1945 and 1949 respectively. There is a tremendous, unmeasured source of irrigation water in the pools of the larger rivers, and many a farmer depends on these natural reservoirs, merely pumping the water a few feet higher onto irrigable land. In times of flood the rock bars of the river beds are covered, and the parallel high-channels visible at low water are also inundated, together with the islets covered with riverine bush. These features are typical of the middle and lower courses of the rivers, and occasionally of the steeper headwater areas, but more commonly the latter have single channels or rocky beds with few pools.

The first water supply for King William's Town was provided by a furrow led out of the Buffalo River into the town. Later, the Buffalo River was dammed at Izeli, and subsequently at Dunbar Lake, to augment the supply of water for

the town. In the first decade of the century, and again some 40 years later, the Buffalo River was dammed at the Pirie and at Rooikrans respectively. The large dam at Rooikrans also supplies Zwelitsha Bantu township and the neighbouring Textile factory. These dams have in large measure made the town independent of the great variations in river flow which had affected its water supplies up to 1910. It is of interest to record, in this connection, the work of William Blomefield Tripp, an engineer who made measurements of the flow of the Buffalo River in the 1880's⁶. It is not clear exactly how the measurements were made, but it seems that Tripp calculated the flow per minute of the Buffalo River at the town dam (Perks Dam), and estimated the proportions of ordinary and flood discharge. He calculated that the maximum monthly discharges in 1881 and 1882 were respectively 8,204 and 10,582 acre-feet (both occurring in March); these compare well with modern determinations. This figure was exceeded in the flood of March 1883, when 21,591 acre-feet discharge was recorded after about 5 inches of rain. The lowest monthly discharges were 552 acre-feet in December 1882 and 306 acre-feet in September 1883, both months being drier than average. In his paper, Tripp expresses concern for the water supply of the towns on the Buffalo River.

"The future of the river Buffalo and of streams like it is an important question, particularly for the towns and

farms situated on their banks. One thing appears to be very probable, viz. that the destruction by bush-fires, Kaffir-hut builders, sawyers, as well as by cultivators of the soil, will yearly diminish the area of the watershed covered by bush, and at last, the natural storing ground being destroyed, the flow of the stream will become so variable that artificial storage reservoirs will be necessitated to equalise it."

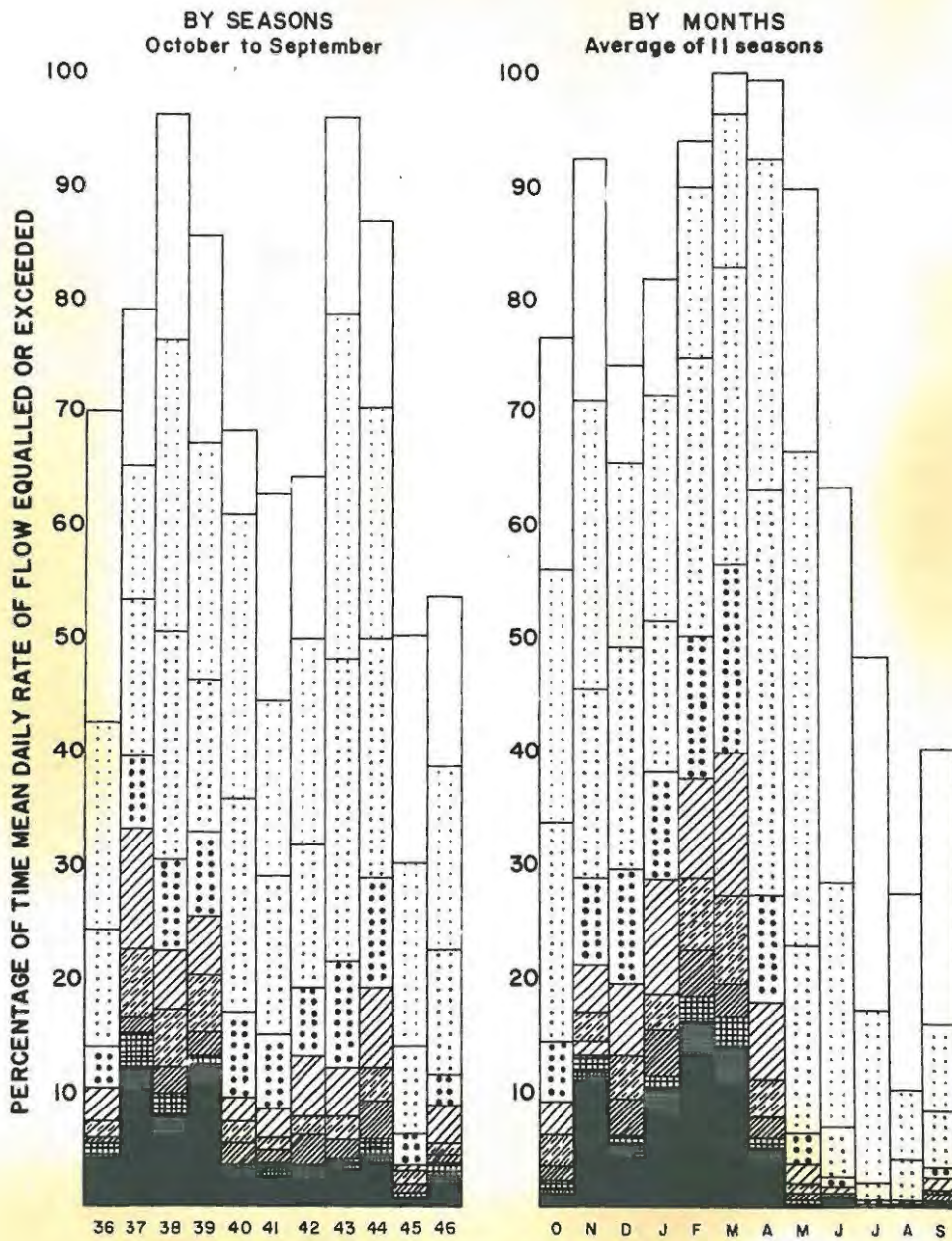
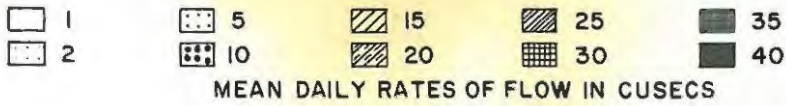
The lack of periods of no flow in his statistics, in spite of the rainfall for 1882 and 1883 being only about three-quarters of the average, suggests that the flow of the Buffalo River has become more variable; but it is also certain that the amount of water required by the towns today could never have been supplied by the river in its natural state.

At East London the earliest water supply came from Baker's Wells on the West Bank. Small dams were subsequently built on the East Bank when it became clear that that side of the Buffalo River included the principal residential area. They were on the Mzoniana and Amalinda Rivers, and were supplied with water pumped from the Buffalo River at Scenery about 10 miles up the river. This remained the principal source of water for East London until 1949 when the Laing Dam was completed.

Most isolated dwellings occupied by Whites in the rural areas have a water supply derived from boreholes, or underground

FIGURE 1

DURATION OF FLOW-BUFFALO RIVER
ABOVE MADEN DAM



SOURCE: HYDROGRAPHIC SURVEY
PAPER No. 7

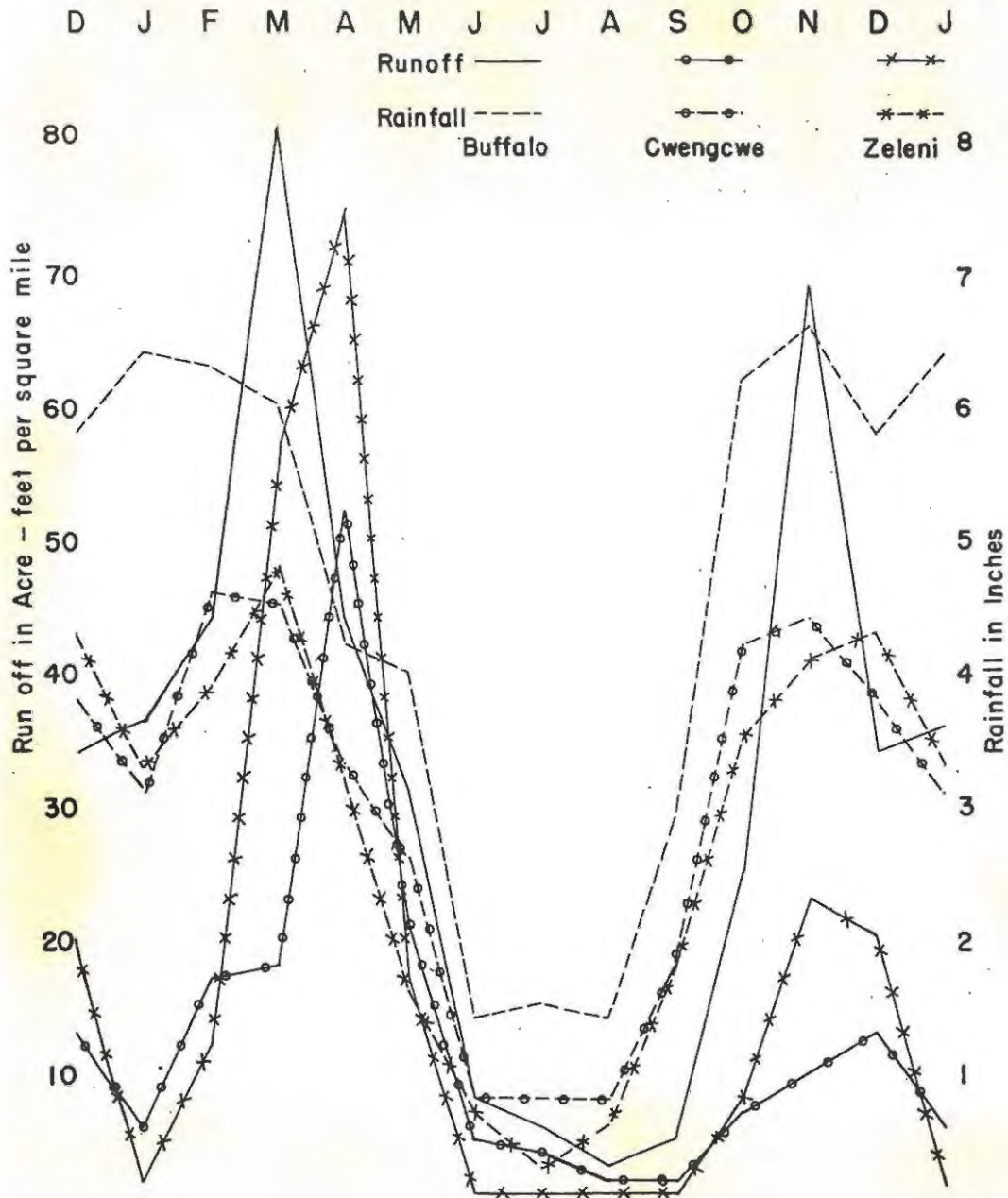
tanks fed by the catchments of house roofs. Bantu areas generally rely on surface water in small earth-bank dams, river pools and vleis. Recently boreholes and windmills have been added to the amenities of those Bantu areas which have accepted betterment.

The inadequacy of water supplies from alternative sources, such as underground and impounded rain water, and the poor quality⁷ of the underground water, has led to a complete reliance on that part of the rainfall which runs off into the river systems. Few measurements of run-off are taken, and those that do exist are confined to the Buffalo River catchment area, but they are sufficient to indicate the nature of the flow, and some connection can be established between that and land use in the catchment.

The following table shows that the headwater areas of the Buffalo River provide a flow more regular than neighbouring small catchments such as those of the Cwengcwe and Zeleni. It presents a series of recent measurements of the flow of the Buffalo River and its tributaries. These, together with an earlier series of readings at the gauging point above Maden Dam on the Buffalo River, indicate that there is a broad correspondence between the seasonal variations in flow and the seasonal variations in rainfall⁸. There are two peaks in both run-off and rainfall, the earlier in late spring, the later in late summer. In the upper parts of the Buffalo River basin

FIGURE 2

MONTHLY AVERAGES OF RUN-OFF AND RAINFALL 1948,50,54,55.



Monthly Averages of Run-off; Buffalo, Cwengcwe, Zeleni Rivers

the spring peak in run-off occurs in November, corresponding with the month of heaviest average precipitation; nearer the coast the spring peak occurs in October, which is the rainiest month at East London. The variations in seasonal flow are best examined in Fig.1 which sets out the duration of flow of the Buffalo River at Maden Dam over a period of 11 years. It is clear that the spring peak in run-off dies away quickly, but that fairly high rates of flow are maintained for a much longer time from January to March. These rates of flow (above 10 cusecs) persist longer in these months than during the spring peak. Then lower rates of flow (between 1 and 9.9 cusecs) prevail for two-thirds of the month of November. Nevertheless November has a fairly large share of flows of 40 cusecs and over, a proportion exceeded only in February. These are months when the most intensive rainfall is to be expected. The lack of sufficient rain to result in run-off from May to September is demonstrated by the low percentage for these months in which flows of 10 cusecs or over are recorded. The amount of time when the flow falls to below 1 cusec is over a third of each month from June to September and increases to nearly three-quarters of the month in August.

The differences in flow over the period from 1936 to 1946 indicate clearly that in the drought seasons of 1945 and 1946 flows of less than 1 cusec occurred during roughly half of this period.

The figures given in Table 2 suggest that the small, tributary catchments in the Buffalo River system have a more erratic flow than that of the main river. There are more months with no flow at all, and occasionally the maximum monthly flow recorded exceeds that of the main river. Compare for instance the maxima for March on the Zeleni and the Buffalo Rivers at King William's Town. The smaller variations in the mountain catchment of the Buffalo River are probably due to the fact that run-off is delayed by the forests covering the slopes of that basin. To what extent differences in land use affect the pattern of run-off will be discussed by reference to three small basins in the headwater region of the Buffalo catchment. They are the Evelyn Valley (Buffalo River) above Maden Dam, the Cwengcwe basin above Izeli and the Zeleni basin above the confluence of the Manzikayeni with it, east of Izeli. Monthly discharge and monthly rainfall for a station representative of the upper parts of each basin were compared for a period of five years, during which the records are exactly comparable for run-off. The averages of monthly discharge and rainfall were then plotted on Fig.2. By this means it was hoped to compare the nature of the variations of run-off and rainfall between each catchment. To remove the effect of the different sizes of each catchment, the discharge was expressed in acre-feet per square mile (of the catchment). The size of each catchment is marked on Table 2.

TABLE 2
RUN OFF IN ACRE/FEET PER MONTH

Gauging Point		July	Aug.	Sep.	Oct.	Nov.	Dec.	Jan.	Feb.	March	April	May	June	Period & No. of years	
BUFFALO above Maden Dam	Highest	116	10108	364	1376	2495	1238	1814	1640	1966	2029	1143	163	1947-58 10 or 11	Catchment area 12.5 square miles
	Average	63	46	161	429	693	561	617	716	788	456	258	83		
	Lowest	0	0	0	0	65	66	60	58	35	27	14	3		
BUFFALO Woolwash Weir. King William's Town	Highest	1467	1247	1600	1678	18977	8259	27404	5315	11366	39997	15268	1242	1947-51 1955-58 4 to 8	
	Average	631	393	696	819	4763	2952	4857	2384	4108	7018	2919	730		
	Lowest	0	0	0	0	76	218	159	0	0	0	0	0		
TYUSHA	Highest	23	19	131	258	908	436	605	108	231	640	428	38	1948-52 4 or 5	
	Average	11	8	38	143	279	223	259	60	76	167	126	13		
	Lowest	0	0	8	34	6	15	9	15	12	7	2	0		
NGQOKWENI Drift on Peddie Road	Highest	30	25	1647	40	8229	1253	575	317	387	7054	1029	55	1947-50 1955-58 5, 6 or 7	
	Average	11	5	335	8	1376	229	154	62	148	1135	356	11		
	Lowest	0	0	0	0	0	0	0	0	0	0	0	0		
CWENGCWE Izeli	Highest	262	186	423	4398	4821	1196	5065	1251	4034	6030	1884	260	1947-58 10 or 11	Catchment area 24.3 square miles
	Average	104	66	138	610	989	363	1009	470	704	1242	378	98		
	Lowest	0	0	0	0	0	0	0	0	0	0	0	0		
ZELENI Izeli	Highest	457	252	1082	9046	11776	3088	8028	5725	11694	11499	2332	375	1947-58 9, 10 or 11	Catchment area 31.2 square miles
	Average	69	46	314	1094	2332	718	1020	952	2192	1427	315	56		
	Lowest	0	0	0	0	0	0	0	0	0	0	0	0		
BUFFALO above Laing Dam	Highest	13401	2062	5681	64051	20604	6814	10590	11819	17890	3563	23869	1074	1950-59 9 or 10	
	Average	1597	412	1563	8045	4291	2017	2952	3340	5952	1604	3412	442		
	Lowest	64	39	141	56	143	36	25	352	1102	574	230	135		
YELLOWWOODS Above Laing Dam	Highest	1	2	30	226	55	2741	1185	1579	2718	620	9802	13	1957-59 2 or 3	
	Average	--	1	15	113	30	1371	740	955	1573	451	3335	7		
	Lowest	0	0	0	0	4	0	294	330	4	190	4	0		
BUFFALO at Scenery	Highest	3165	2285	8479	249679	78935	28014	13650	50546	42800	39889	132042	14573	1934-57 24	
	Average	627	470	1308	12132	10903	4097	4432	6320	10368	5678	6826	1173		
	Lowest	0	0	0	0	204	6	0	33	11	0	0	0		

Notes: Averages unreliable for stations with less than 3 years' record. -- indicates negligible flow.

Source: Hydrological Research Division, Department of Water Affairs, except that for Buffalo River above Laing Dam, Figures are from City and Water Engineer, East London.

The average summer peak-month discharge for the Buffalo River is above that for the Zeleni, but not by much; whilst the rainfall for the Zeleni basin is considerably lower than for the Buffalo. Proportionately more of the Zeleni's rainfall must appear as runoff. The spring peak discharge for the Buffalo is well in excess of that of the Zeleni, but the difference between their rainfalls is not greater than an inch more than in summer. The lag between the peaks of monthly rainfall and the peaks of discharge differs significantly between these two basins. In general there is another month's lag in the Buffalo basin. In the Zeleni basin spring peak discharge is reached a month earlier than peak rainfall. It is suggested that the reason for this lies in the great difference in the type of surface cover to be found in each basin. The Buffalo River is at this point flowing from an area nearly completely forested, but the Zeleni has only small patches of forest at its sources, and otherwise has closely cropped veld or cultivated land. A similar difference may be detected by comparing the Zeleni with the neighbouring Cwengewe. The rainfall curves for these two basins are very similar, except that the peaks for the Zeleni occur a month later, in March and December. The lag between these and peak monthly discharge is again two months in summer for the Cwengewe, which is at least half forested, as against one month for the Zeleni. The biggest divergence occurs between the curves of run-off.

There is more run-off from the Zeleni basin than from the Cwengcwe, especially in March and April, but also in November and December. It would appear that the geological differences between the three basins are not sufficient to affect this pattern of run-off. It would be expected that run-off should be greater from impervious dolerite, and dolerite underlies most of the Evelyn Valley and only a small percentage of the Zeleni catchment. These tentative correlations are in harmony with the results of experiments carried out in Pretoria by Thompson, who showed that run-off is negligible from ungrazed natural veld, 4 per cent from grazed veld, and nearly 10 per cent from veld, grazed and burned. From cultivated areas it varied with crops, but was 20 per cent from maize and nearly 25 per cent from unplanted, cultivated ground⁹. Thus it can be shown that land utilization in river basins, but especially in those which are the sources of the water supply of large towns or irrigation settlements, is vital to the proper regulation of the water they provide.

REFERENCES TO CHAPTER 3

1. See aerial photograph opposite p.23
2. Recorded by W.E.Drummond Jervois on Military Sketch of part of British Kaffraria 1847-48, J.Arrowsmith, London.
3. Opposite page 25 .
4. Relief is measured by the difference between the highest and lowest points in quadrangles roughly a mile square. The choropleths on the map have been drawn at appropriate intervals.
5. Areas of catchments of main rivers in square miles.

Buffalo	500	Kwelera	149*
Gonubie	257*	Kwenzura	55*
Nahoon	219	Gulu	47
Chalumna	164	Ncera	27

* Not entirely within the survey area.
6. W.B.Tripp, Minutes of the Proceedings of the Institute of Civil Engineers 83, 1884-5 (3) p.241.
7. See this volume Chapter 4 and G.W.Bond, A Geochemical Survey of Ground Water Supplies of the Union 1946. Memo.41, Geological Survey of S.Africa (Dept. of Mines).
8. For details see Chapter 4 of this volume.
9. W.R.Thompson, Moisture and Farming in South Africa C.N.A. 1935, Table to face p.124.

Chapter 4

CLIMATE

I. INTRODUCTION

There is little need to stress the importance of climate in a general study of natural environment. Its importance with respect to the distributions of all forms of life in the land areas of the world is shown more particularly by the variations of natural vegetation, the visible indicator of climatic character. No less important is the influence of climate upon agriculture, and in that and other ways upon the welfare of mankind in the various parts of the world.

The study of climate is concerned with its elements, such as rainfall, humidity and temperature; and their average values for the year, or for particular months or seasons, are no more important than the departures from average values. It follows that all weather phenomena contribute to the sum total of conditions that characterize the climate of a particular place or area. Great interest also attaches to the longer-term variations of climate, particularly those of rainfall in a sub-humid region such as South Africa.

The understanding of climate is intimately bound up with the factors that influence it, and foremost amongst these are the global position of the area concerned, including its latitude and its distance from the sea, as well as its position

in relation to the great wind belts of the earth, while altitude is also of considerable consequence.

The Border Region is between 32° and 34° south, well within the Warm Temperate Zone. Its position, on the south eastern side of the continental mass of Southern Africa, means that the southward continuation of the warm Mozambique current occupies the adjacent zone of the Indian Ocean, and its presence emphasises the oceanic influence upon the coastal belt of this part of the Union, notably by ameliorating the winter near the sea.

The Border Region is too small an area to allow of the development of marked continentality of climate away from the coast, yet the inland transition from humid and equable conditions is quite noticeable. The general increase in elevation away from the coast, up to roughly 2,000 feet at the base of the Amatole Mountains, some 30 miles inland, is an important factor in the distribution of climate within the region, so that there is a noticeable contrast between the conditions at the coast, and those that obtain 20 to 30 miles inland. Equally striking is the influence of local relief upon climate, such as the smaller rainfall within the successive river valleys, or the wetter and cooler conditions met with in the Amatole Mountains. The general elevation of the South African plateau at an altitude of 4-5,000 feet, gives the whole area of the coast belt below it certain common characteristics.

The two main controls are hot, dry air coming from the

plateau, and cool, moist air from the southern ocean. The zone of interplay between these shifts seasonally, and leads to seasonal changes in the roles played by these two types of air. Air masses of tropical origin occasionally affect the area in the summer half-year, and give a particular character to that period by bringing general rains to the coastal districts of this part of South Africa¹. Associated with the movements of air masses are the presence and movements of pressure systems, which are responsible for the approach of the different air masses. A weak anticyclone dominates the South African plateau at all times of the year, although the high pressure moves northwards in winter².

South of the continent the eastward succession of depressions and anticyclones, originating in the southern Polar front, affects the coastal regions from the Cape Town area to Durban. The passage of depressions, which are further north in winter, is the cause of much of the variable weather in the Border Region. Noteworthy is the variability of weather in spring and autumn, when the frequent contrast between high pressures in the interior of the Union and particularly low pressures near the coast to the south or east, is associated with the greater frequency of invasions of tropical air in the summer half-year.

The important question of whether or not the rainfall conditions of the Union are progressively deteriorating has been the subject of much study in recent years, notably by

Acocks, Kokot, Schumann and Tidmarsh³. The importance of climate in its relation to agriculture is well known, and its significance in the differentiation of agricultural regions in South Africa is apparent from the agro-economic map of the Union⁴.

II. TEMPERATURE

(a) General

The salient facts of temperature circumstances in the Border Region are revealed by a study of the data given in Table 3, in which East London is contrasted with King William's Town some 30 miles inland, and with Evelyn Valley in the Amatole Mountains.

The area immediately adjacent to the coast is equable in contrast with the inland part of the Border Region, though no part of the two districts can be said to have a continental climate. There is increasing continentality as one proceeds inland, shown clearly by the higher mean daily maxima, lower mean daily minima, and greater mean daily range in King William's Town throughout the year, as compared with East London. That this contrast becomes still greater further from the sea is revealed by the mean daily range for each month at Queenstown.

There is a great change in the temperature régime as between the coastal lowlands and the mountains, shown by comparing East London and King William's Town with Evelyn

Table 3

AVERAGE TEMPERATURES (Degrees Fahrenheit)

		J	F	M	A	M	J	J	A	S	O	N	D
<u>Mean Daily Maximum</u>	East London	77.4	78.1	76.5	74.3	72.7	69.6	69.8	70.3	70.5	70.9	73.0	75.2
	King William's Town	83.3	83.7	81.3	78.4	74.8	71.1	69.6	73.2	74.7	75.9	78.1	80.8
	Evelyn Valley	72.3	72.7	71.1	67.5	64.6	59.9	58.6	63.1	63.5	65.7	68.4	70.2
<u>Mean Daily Minimum</u>	East London	64.2	64.9	63.5	59.2	55.0	50.9	50.4	52.2	54.5	57.6	59.7	62.1
	King William's Town	61.0	62.1	59.9	54.3	48.0	42.6	41.9	44.8	49.1	53.4	56.5	58.8
	Evelyn Valley	52.3	52.9	52.2	48.4	44.8	42.4	40.6	42.3	43.2	45.0	47.7	50.7
<u>Mean Daily Range</u>	East London	13.1	13.1	13.0	15.1	17.6	18.7	19.4	18.2	16.0	13.3	13.3	13.1
	King William's Town	22.3	21.6	21.4	24.1	26.8	28.4	27.7	28.4	25.6	22.5	21.6	22.0
	Evelyn Valley	20.0	19.8	18.9	19.1	19.8	17.5	18.0	20.9	20.3	20.7	20.7	19.4
	Queenstown	27.2	25.9	25.6	27.0	28.1	29.7	27.7	29.2	28.6	28.6	26.6	27.9
		EXTREMES OF TEMPERATURE (Degrees Fahrenheit)											
<u>Maxima</u>	East London	91.0	99.3*	94.3	94.3	94.8	89.4	91.6	98.1	106.3	103.3	97.9	93.9
	King William's Town	109.4	113.0	105.1	104.0	97.0	89.1	90.0	97.0	106.0	104.0	107.1	108.0
	Evelyn Valley	98.1	99.0	93.0	102.0	91.9	77.0	82.9	84.0	97.0	91.9	98.1	105.1
<u>Minima</u>	East London	54.7	51.8	53.1	45.0	39.9	39.4	37.0*	37.6	42.6	46.9	49.3	52.0
	King William's Town	46.9	46.9	42.1	39.0	30.0	28.9	29.5	30.9	34.0	38.9	38.9	43.0
	Evelyn Valley	37.0	39.0	38.9	35.1	30.0	30.0	21.0	27.0	28.9	30.0	30.0	34.0

* New records since 1950: 108.7°F (17.2.55); 35.2°F (28.7.54).

Source: W.B.19. East London Weather Office 11 years, 400 feet
 King William's Town 19 years, 1,200 "
 Evelyn Valley 40 years, 3,800 "
 Queenstown 16 years, 3,500 "

Valley. The figures show that the mountain climate has one of the attributes of the interior, its relatively high mean daily range. The station at Evelyn Valley is fairly well exposed at 3,800 feet, and the mean daily maxima are generally about 10°F less than at King William's Town, which lies 2,600 feet lower. In this respect the station is transitional to cool temperate, and the fact that this reduction exceeds the usual fall of 1°F for every 300 feet of increasing altitude may be put down to berg wind temperatures experienced below the mountains. In winter, minimum temperatures at the two places are, however, very similar, largely because King William's Town lies in a frost pocket whereas the mountain station has free air-drainage.

The sea, with its warm current off-shore, moderates the temperatures at East London, so that the mean daily minima are not below 50°F in any of the winter months, and the mean daily maxima are not above 80°F in any month of the summer. The highest mean daily maximum is delayed to the month of February, as it also is at King William's Town, due to the delay in the heating up of the ocean, and of the air near the ocean. King William's Town is, on the average, hotter than East London in the daytime at all times of the year except in July. The difference between the greatest and least mean daily maxima in East London is 27.7°F , and that in King William's Town 41.8°F , clearly showing that the maritime

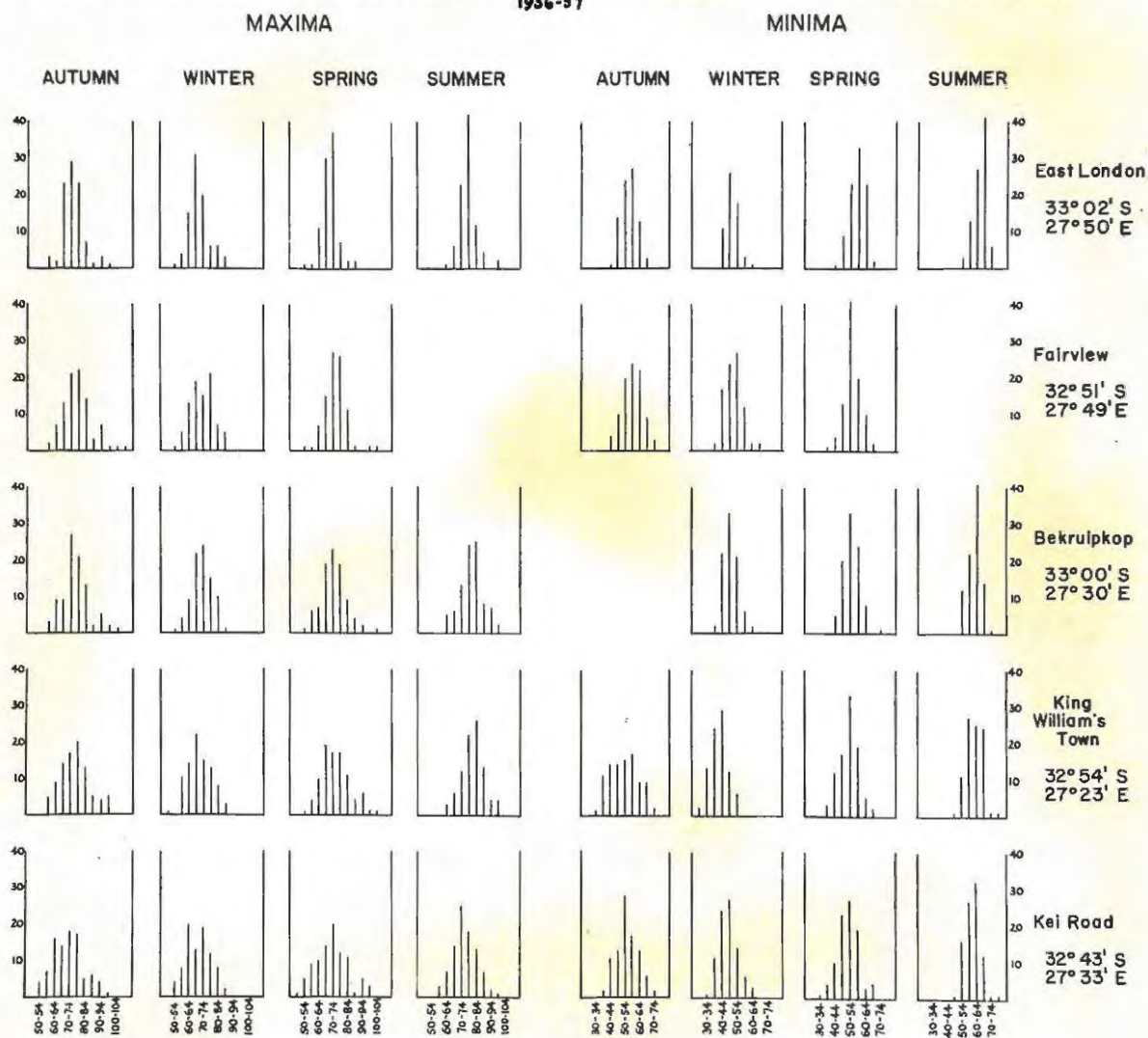
situation of East London is responsible for its more equable temperatures. King William's Town has lower mean daily minima than East London in all months, but the difference is greatest in winter, when the coast has minimum temperatures of just over 50°F , about 8°F higher than at King William's Town.

The mean daily ranges at East London and at King William's Town differ significantly from month to month. At East London it is **greatest** in July, when both hot berg winds and cold spells are particularly prevalent. It is **smallest** in March, although then only a very little lower than in several preceding months. Inland at King William's Town, however, the mean daily range is **greatest** in June and in August, not in July, and the same is true of Queenstown. The mean daily range is least in March at both King William's Town and Queenstown, as in East London.

Very high temperatures are experienced in the Border Region in all months of the year, more than 90°F having been recorded in all months, except in June, both at East London and at King William's Town. This widespread seasonal distribution of high temperatures is largely due to the occurrence of berg winds in all seasons. Table 3 shows that temperatures of over 100°F have been recorded in February, September and October at East London, with the highest value, 108.7°F , in February; whereas over 100°F has been recorded at King

FIGURE 3

NUMBER OF DAYS WHEN TEMPERATURES WERE RECORDED WITHIN SPECIFIED LIMITS OF 5 FAHRENHEIT DEGREES
1956-57



Number of days when temperatures within specified limits.

William's Town during eight months, from September to April, highest in February with 113°F ; and that values over 100°F are not unknown at Evelyn Valley in spite of the altitude. Screen temperatures as low as freezing point are unknown at East London, but are recorded at King William's Town during the winter months May to August, and at Evelyn Valley from May to as late as November. Excessively low temperatures, however, are rare even at the last locality, the 11 degrees of frost recorded there for July having occurred as far back as 1914.

Frost does not occur at the coast except in exceptional circumstances. On 28th July, 1954, an exceptionally cold night, 35.2°F was recorded at East London and 26.1°F at King William's Town. In sheltered hollows even close to the coast, ground frost was experienced in places where it had been previously unknown, at a time when ground frost was widespread in the Eastern Cape Province. King William's Town usually experiences a temperature of 32°F , measured under standard conditions 4 feet above the ground, only in mid July, and then only in 2 years out of 5. At Evelyn Valley, at an altitude of 3,800 feet, frosts commonly occur from mid-July to early September. Information with respect to frost frequency, and the seasonal distribution of frost for these stations is given in Table 4.

Table 4

FROST OCCURRENCE

	Number of yrs. with frost	Average date first frost of autumn	Average date last frost of spring	Extreme first frost	Extreme last frost
East London (11)	0	-	-	-	-
King William's Town (30)	12	11 July	15 July	30 May	24 August
Evelyn Valley (29)	25	17 July	2 Sept.	1 May	16 Nov.

Source: W.B. 19. Years of record in brackets.

Figure 3 shows the number of days when temperatures were recorded within specified limits of 5 Fahrenheit degrees for each season, and is based on the records of five stations at various distances from the coast⁵. Several trends in the changes of the temperature régime within the Border Region, from the coast to the interior, may be observed. The maritime régime at East London is picked out by the concentration of many recordings of maxima at or about the median value for the season, thus clearly indicating the capacity of the ocean to moderate the excessive effects of warm weather. At the same time, the widest maxima inland show a less concentrated peak, as well as a wider range of value. In the year for which figures are available, the remarkable, relative uniformity of East London's summer weather is shown by the

42 maxima from 75° to 79°F, and the 41 minima from 65° to 69°F.

King William's Town, where the station is near the bottom of the Buffalo River valley, in which cold air collects on still nights, tends to have higher maxima and lower minima than stations on the more exposed parts of the coastal plain. This is particularly the case in winter (June, July and August), and in summer (October, November and December), as is shown in Figure 3. On the other hand some summer nights are stifflingly hot in King William's Town, usually during berg wind spells.

Some of the contrasts between these five stations may be readily detected in the records shown in Table 5, giving the maxima on a particularly hot day in the area, and the minima on two particularly cold days. The first of these was a berg wind day, the second cloudless with a light breeze, the third cloudy and raw, with snow on the mountains.

Table 5

TEMPERATURE MAXIMA AND MINIMA FOR SELECTED DAYS

	<u>7.11.1956</u>	<u>10.6.1956</u>	<u>28.8.1956</u>
	<u>maxima</u>	<u>minima</u>	<u>minima</u>
	<u>°F</u>	<u>°F</u>	<u>°F</u>
East London	85	45	40
Fairview	102	42	38
Bekruipkop	100	37	36
King William's Town	100	31	38
Kei Road	97	36	33

(b) Cold Snap Weather

As a depression passes to the south of the Union, the colder air which succeeds warmer dry air is sometimes much colder and more unstable than usual. This is especially so in winter, when a supply of Polar air⁶, originating in very high latitudes, reaches Southern Africa. This layer of intensely cold air is thicker than the cool sub-Polar air which comes from the southern ocean in summer, and so it often covers the plateau, giving rise to the severe cold snaps with snow and sleet on high ground, followed by days with frost. Characteristically, these cold snaps, or Polar outbreaks, bring raw weather to the Border Region, during which temperatures are low and relative humidity high. There is considerable orographic precipitation, and the Winterberg and Amatole Mountains are often snow-clad for a day or two, though snow is only occasionally experienced in the upland zone below the mountains. This type of severe wintry weather comes three or four times a year from June to September, and often lasts, in mid-winter, for several days at a time. The number of days of cold-snap type recorded in 1955-57 is given in Table 6.

Table 6

NUMBER OF DAYS ON WHICH 'COLD SNAP' WEATHER OCCURRED AT
EAST LONDON

	J	F	M	A	M	J	J	A	S	O	N	D
1955	0	0	0	0	0	1	2	2	2	0	0	0
1956	0	0	0	0	0	1	5	3	7	0	0	0
1957	0	0	0	0	0	5	8	2	0	0	0	0

Source: Weather Bureau, Monthly Reports.

A severe cold snap, which brought snow to mountains of the King William's Town district, occurred during the survey period on August 28th, 29th and 30th, 1956. At East London, at 8 a.m. on the 28th, air temperature stood at 43°F, whilst relative humidity was 88 per cent. There was a strong westerly wind, and there was rain with some thunder during the day. Although the sky cleared and there was 11 hours of sunshine on the 29th, the temperature remained low, especially away from the coast. On the third day the low temperatures of early morning were clearly not maintained in the day time, as the dry tropical continental air mass reasserted itself from the north and north-west. This, however, was again replaced by moister, cooler air on the 31st.

During such severe weather there is a great danger that livestock may succumb to the cold, shorn sheep being particularly susceptible. In the Border Region sheep used to be shorn regularly twice a year to produce the well-known

Kaffrarian short wools, the second shearing taking place in early spring. As early as a hundred years ago the King William's Town Gazette⁷ was advocating the use of sheep sheds to protect the stock from inclement weather, but only a few farmers have considered the building of sheep sheds worthwhile. The treeless sourveld of the uplands affords less protection than the bush on farms nearer the coast, which may provide sufficient cover against chilly rain. Shearing once a year, now the general practice on White farms, has rendered sheep less susceptible to death from exposure in these conditions.

The lowest temperatures occur with the advance of an anticyclone behind the depressions mentioned above. Although the same Polar air mass is involved, the sky is often cloudless, which allows a maximum of outgoing radiation. On calm nights with these conditions during the winter months, most sheltered hollows inland may expect frost, and on one occasion (28.7.1954, see p.49) frost was experienced at the coast. There is rarely any damage to pineapple plantations which are near the coast and on slopes from which air freely drains. On the other hand irrigated citrus orchards can be affected if they are situated in frost pockets, the deep, meandering river valleys naturally providing many situations of this kind.

III. WIND

(a) General

Although East London has acquired the reputation of being the windiest place on the coast of the Union, this is unjustified in view of the available records⁸. The mean velocities for all hours for the year in miles per hour are 7.8 at Durban, 10.8 at East London, and 11.6 at Port Elizabeth. Cape Agulhas, at the southern tip of the continent, is windiest with a mean velocity of 14.1 miles per hour.

That East London is less windy than Port Elizabeth is further reinforced by records of the frequency of winds of 9 miles per hour or of greater velocity, as shown in Table 7. Only for four months of the year is East London windier in this respect, whilst in a year Port Elizabeth has 226 days with winds of this velocity, as compared with 214 days at East London.

Table 7

PERCENTAGE FREQUENCY OF WIND VELOCITY OF 9 M.P.H. AND OVER

	J	F	M	A	M	J	J	A	S	O	N	D
<u>East London</u>												
Per cent	55.6	52.0	51.8	52.9	57.3	58.0	57.4	61.0	62.1	65.1	65.6	62.5
No. of days	17	15	16	16	18	17	18	19	19	20	20	19
<u>Port Elizabeth</u>												
Per cent	64.9	64.1	60.1	57.3	50.6	54.9	55.1	57.2	66.0	71.2	71.1	69.6
No. of days	20	18	19	17	16	16	17	18	20	22	21	22

Years of record: East London 5, Port Elizabeth 8.

Sources: Surface Winds of South Africa. Weather Bureau, Pretoria. W.B.6, 1949.

EAST LONDON AIRPORT WIND DIRECTION AND SPEED

PERCENTAGE FREQUENCY OVER 5 YEARS

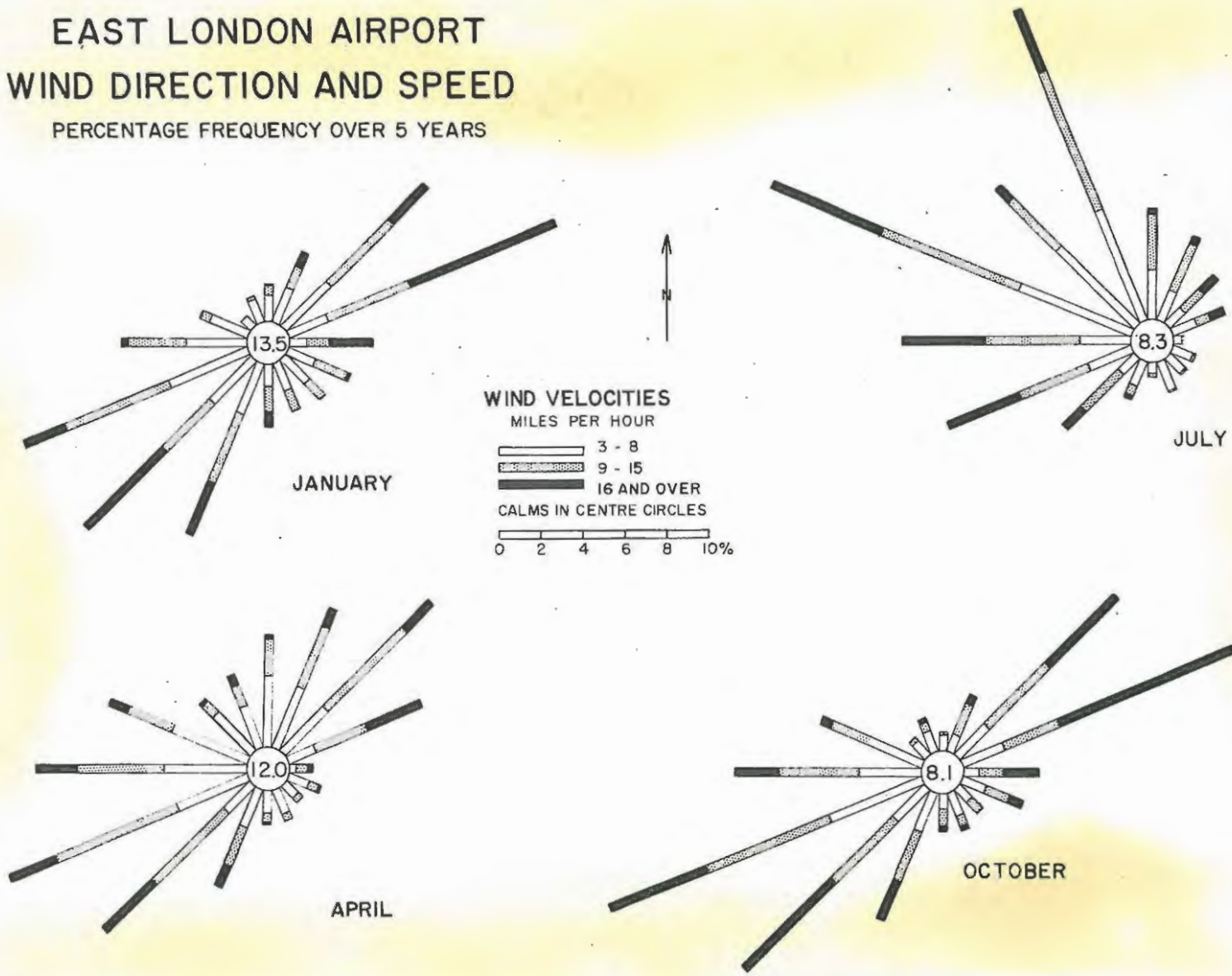


FIGURE 4

At East London, February, March and April are least windy, in terms of velocity. The month with most calms is March, closely followed by January, February and April. It is fortunate for the holiday season that 13.5 per cent of observations in January are recorded as calms. The other holiday month, July, has only 8.3 per cent calms. August and the spring months are generally the windiest of the year.

Wind roses for East London airport are shown in Figure 4. Because of the small percentage frequency of winds of 39 miles per hour and over, they do not appear separately on the wind roses. It is worth noting, however, that such winds occur in May, June, July, during the spring months, and in December, and are usually from a westerly direction. The noteworthy exceptions to this direction is in November, when 6 in 10,000 winds of this force are from east-north-east, and when 8.6 per cent of winds from the same direction are between 16 and 38 miles per hour. Within the Union only recording stations in the Karroo have a record of stronger winds.

Maximum average wind speeds at East London over the period of an hour have been recorded in October and November (46 miles per hour). A maximum wind gust of 78 miles per hour, from west-north-west, was recorded one July, probably a berg wind.

The prevailing winds at East London are westerly. Winds from this direction are least prevalent in the first three

months of the year, and in November, when winds from the north-east, or from a nearby point, are more in evidence. The latter have some of the characteristics of sea breezes, although the distribution of major pressure systems is a more important cause than the local heating of the land mass. Sea breezes are not noticeable at East London in winter⁹. The absence of land breezes was noted in 1860 as a point of favour of the harbour at Buffalo Mouth¹⁰.

South-west, west-south-west and south-south-west winds are strongest. They are above the average velocity in every month of the year. East-north-east, north-east and east winds are almost as strong, but they are not of such a consistently high velocity as the westerly winds. The prevailing direction of the stronger winds is thus roughly parallel to the trend of the coastline. The deeper valleys, at right angles to the coast, tend to provide satisfactory shelter from such winds, and the north-east facing slopes are thus the hottest aspects, whereas, especially near the coast, the south-west aspects are cooler. As a consequence there appears to be a marked difference in the value of the grazing on these different aspects. In what is known as mixed veld, a category of grazing considered to be widespread in the two districts¹¹, the veld on the warmer aspects is called sweet, and that on the cooler sour. Cattle and sheep prefer the sweet veld because it is more palatable, and, when they have unrestricted access to both,

the sweet veld
is more heavily grazed. There is thus a greater risk of erosion on such favourable aspects, following over-grazing.

The original run-way at East London's airport was appreciably inclined to these strongest prevailing winds. There have been many occasions when aircraft have had to overfly the airport, because of these so-called cross-winds. A new run-way is under construction (1959) which, being aligned south-west to north-east, will permit aircraft to land and take off in most winds.

The harbour works at East London are designed to add to the natural protection against westerly winds which is afforded by the point on the West Bank. In the nineteenth century there were many instances of shipwrecks on the beach east of the Buffalo River mouth as the result of winds which were described as south-easters, from which there was then no protection for vessels lying in the roadstead.

(b) Berg Winds

One of the outstanding features of weather in the Border Region, and one which has far-reaching effects on the activities of the area, is the occurrence of berg winds. Berg winds usually blow from the plateau at right angles to the coast, often occurring at the approach of a depression as it passes the southern coast of the Union. Jackson¹² considers that their origins are in the warm, dry, tropical continental air-mass which covers the plateau most of the year. Berg winds

are often very gusty, and are accompanied by unusually high temperatures. Dust storms and dust haze frequently reduce the visibility, whilst at the coast sea spray hangs in the air making conditions very muggy. The effect of a situation only a short distance from the sea upon relative humidities, during the mid-winter months when berg winds tend to be most frequent, is shown in Table 8.

Table 8

MEAN RELATIVE HUMIDITIES AT 8 A.M.

	1953			1954			1955		
	June	July	Aug.	June	July	Aug.	June	July	Aug.
East London Airport	63	59	70	67	58	63	63	63	59
East London Signal Stn.	72	67	85	82	77	84	75	71	62

Source: Weather Bureau Annual Reports

East London Signal Station is situated on top of a dune and a few hundred yards from the sea. The airport is 2 miles inland.

Inland there is a very great danger of veld fires, as the air brought by the berg wind is of low relative humidity, and desiccates everything it passes over. Although berg winds are recorded in all months, they are more common in the winter half-year, since the pressure situations which are necessary for them then occur closer to the coast. Their seasonal distribution during the three successive years 1955-7 is shown

in Table 9, from which it is also evident that the number of days with berg wind varies considerably from year to year. Their greater frequency in winter helps to increase the monthly temperature means for those months. In summer the berg wind is less common, but produces hotter days than in winter.

Table 9

NUMBER OF DAYS WITH BERG WINDS AT EAST LONDON

	J	F	M	A	M	J	J	A	S	O	N	D
1955	2	1	1	2	7	6	9	7	6	4	1	4
1956	3	1	3	1	2	4	4	3	2	1	2	0
1957	0	3	1	3	2	1	3	5	4	3	4	1

Source: Weather Bureau, Monthly Reports.

A typical winter-time berg wind was observed at East London on the 29th and 30th of August, 1955, and the weather features for these days are given in detail to illustrate their striking characteristics. At 2 o'clock on the afternoon of the 29th, the dry bulb temperature stood at 74°F, and the relative humidity was 39 per cent. The day had started cloudless, with a northerly wind of 11 miles per hour. At 2 p.m. the wind had veered to east-north-east, and had strengthened to 17.6 miles per hour. On that day a maximum temperature of 83.3°F was recorded. At 8 a.m. on the 30th, the dry bulb temperature was already 72.3°F, and a maximum of 81°F was reached later. The relative humidity at 8 a.m. was 29 per cent, but by 2 p.m. the berg wind, which had been blowing

from north-north-west at 9.6 miles per hour backed to south-west with the arrival of moist air. Relative humidity had by then risen to 89 per cent, and the dry bulb temperature was 62.4°F. The sky was only slightly clouded at 8 a.m., but by 2 p.m. it was completely overcast, and rain fell early the next morning. It can be added that the replacing moist air mass on such occasions is usually of sub-polar type, and its arrival is generally marked by a rise of atmospheric pressure.

An example of a summer berg wind, and of its sequel, at East London is given in Table 10. The occasional occurrence of berg winds in summer is responsible for marked drying up of vegetation and of crops. Much damage is done to pineapples during summer-time berg winds, when the fruit is nearly mature, owing to the high temperatures that occur, sometimes well over 100°F, as well as to the drying effect of abnormally low relative humidities.

Table 10

BERG WIND CONDITIONS, EAST LONDON, FEBRUARY 14th, 1957

Hour	Dry Bulb Temp. °F	Pressure mb.	Rel. Humidity %	Wind Direction	Wind speed m.p.h.	Cloudiness
8 a.m.	76.5	1003.9	65	NNE	10	5/8
2 p.m.	91.4	997.7	38	WSW	11	1/8
8 p.m.	65.8	1008.4	62	SW	26	6/8

Maximum and minimum temperatures during the day 98.6°F and 67.6°F respectively. There were showers when the cooler air had arrived.

IV. CLOUD, SUNSHINE, HUMIDITY AND EVAPORATION

(a) Cloud

The transitional character of the Border Region with respect to the proportions of summer and winter rainfall tends to be reflected in the distribution of cloudiness. At East London, both at 8 a.m. and at 2 p.m., as shown by the figures in Table 11, the amount of cloud is greater during the summer half year, but the difference is not as great as at Durban, where the summer months are more cloudy and the winter months less cloudy than at East London. East London is more cloudy than Port Elizabeth in all months of the summer half-year, but in the mid-winter months the position is reversed, with greater cloudiness south-westwards towards the winter-rainfall area. At East London the rainfall maxima in spring and autumn, are indicated in the cloudiness records only by the fact that the most cloudy month is October, with the amount dropping through November to still less in December. Morning cloud diminishes inland, King William's Town having less cloud than East London in all months.

Table 11

AVERAGE AMOUNT OF CLOUD (in tenths)

A. At 8 a.m.

	J	F	M	A	M	J	J	A	S	O	N	D
Port Elizabeth(14)	5.4	5.0	5.2	4.6	4.6	3.6	3.8	4.1	4.7	5.6	5.4	4.9
East London (11)	5.7	5.7	5.5	4.6	4.1	3.3	2.9	3.8	4.8	5.8	5.7	5.5
King William's Town (19)	4.8	4.9	4.9	3.8	3.3	2.4	2.7	3.2	3.6	5.0	5.1	5.0
Durban (15)	6.1	5.4	4.9	4.2	3.3	2.7	2.5	3.7	4.9	6.3	6.1	6.0

B. At 2 p.m.

Port Elizabeth(14)	3.8	3.9	4.1	4.1	4.4	3.9	3.6	3.9	4.4	5.1	4.4	3.9
East London (11)	5.5	5.2	4.9	4.6	4.5	3.4	2.9	3.8	4.8	5.8	5.7	5.5
Durban (15)	5.9	5.4	4.9	4.2	3.4	2.5	2.5	3.2	4.6	6.5	6.5	6.3

Source: W.B.19. Years of record in brackets.

(b) Mountain mist

Although there is no widespread area which can be termed a mist belt, as in Natal, the Amatole Mountains are often affected locally by the occurrence of resting low cloud or mist¹³. This is found to form frequently in the evenings, in a light south-easterly airstream, and to disperse after sunrise. Evelyn Valley station records 61 days with mist in a year, a circumstance not without effect on the character of the vegetation. This frequency is very similar to that recorded for Mistley, characteristic of the mist belt in Natal, but at Evelyn Valley the occurrence is more evenly distributed through the year, though it has there a marked summer maximum, as is shown in Table 12.

Table 12

NUMBER OF DAYS ON WHICH MIST WAS RECORDED

	J	F	M	A	M	J	J	A	S	O	N	D	Year
Mistley (Natal)*	9	5	5	3	2	1	1	2	5	9	7	8	57
Evelyn Valley	6	6	6	4	3	2	3	3	5	7	9	7	61

* Mist and drizzle. Both stations include low cloud at ground level.

Source: Weather on the Coasts of Southern Africa.

(c) Coastal fog

There is more fog off the coasts of the Border Region than off Durban, but it is only occasionally a hindrance to shipping. Compared with the west and south coasts of the Cape Province, the East London area has very little fog, and it is noteworthy that the incidence of fog increases rapidly southwards, the average number of days in the year with fog at Port Elizabeth being approximately four times as many as at East London, and every month of the year having a higher frequency of fog, as is shown in Table 13.

Table 13

AVERAGE NUMBER OF DAYS WITH FOG

	J	F	M	A	M	J	J	A	S	O	N	D	Year
Port Elizabeth (5)	1.0	2.0	3.0	2.0	2.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	17.0
East London (?)	0.7	0.6	0.6	0.5	0.1	0.0	0.1	0.2	0.3	0.5	0.4	0.3	4.3
Durban (20)	0.2	0.1	0.3	0.0	0.0	0.0	0.0	0.3	0.3	0.2	0.1	0.1	1.6

Year of record in brackets.

Source: Weather on the Coasts of Southern Africa.

(d) Sunshine

The sunshine records are broadly complementary to the variations in cloudiness. At East London the largest percentages of possible sunshine are recorded in the winter months. While Port Elizabeth has more sunshine, Durban is much more cloudy. This position is illustrated in one respect by Table 14, which gives for each month the number of days with no sunshine for these three ports, for a recent 3-year period. This table shows that the number of sunless days in the year is much the same for East London and Port Elizabeth, but Port Elizabeth's sunnier summer and duller winter are clearly seen. Durban is seen to have more than twice as many sunless days as the other two ports. At Dohne, near the Amatole Mountains and just outside the region, there are almost as many sunless days as at Durban, and far more than at East London in the summer holiday season. Dohne is typical of the upland part of the survey area, where the incidence of sunless days undoubtedly reduces evaporation in the sourveld area, and is important for the growth of dry-land fodder crops such as lucerne and teff.

Table 14

NUMBER OF DAYS WITH NO SUNSHINE RECORDED - AVERAGE 1953-55

	J	F	M	A	M	J	J	A	S	O	N	D	Year
Port Elizabeth	0.3	2.3	2.0	0.3	0.3	1.3	0.3	1.3	1.3	1.7	1.7	0.0	12.8
East London	0.7	3.3	0.7	0.3	0.3	0.3	0.0	0.3	1.3	3.3	2.0	1.0	13.5
Dohne	2.7	4.3	2.7	1.0	1.0	0.3	0.0	1.3	2.7	4.7	3.7	4.0	28.4
Durban	4.7	2.7	3.0	2.0	1.3	0.7	0.3	1.7	2.0	7.0	4.3	3.3	33.0

Source: Weather Bureau Annual Reports

Dohne lies outside the Border Region, 32°31'S, 27°28'E, 3,000 ft. above sea-level.

(e) Relative humidity

East London is, in terms of mean annual relative humidity at 8 a.m., the least humid place on the South African coast for which records are available. It has, however, higher relative humidities than inland stations. The recording site is some 2 miles inland at Collondale, and relative humidity there is probably a little lower than at the coast itself. The site, however, is fully exposed to sea breezes, and therefore strongly influenced by the nearness of the ocean. The mean hourly values of relative humidity at East London are compared with those of Queenstown in the interior in Table 15. At East London the means for all hours for each month show relative humidity to be greatest in March and October, the most rainy months, and to be well below all other months in the two winter months, June and July. The mean humidity for all hours is

greater at East London in all months, but the mean diurnal range is on the whole very much less at East London.

Table 15

	<u>RELATIVE HUMIDITY (per cent)</u>											
	J	F	M	A	M	J	J	A	S	O	N	D
<u>Means for all hours</u>												
East London (11)	80	80	81	77	69	64	62	70	75	80	79	78
Queenstown (4)	68	69	75	70	64	55	49	53	60	65	64	64
<u>Mean maxima and minima</u>												
East London (11)	88	88	88	83	78	73	72	78	82	87	86	86
	70	70	70	64	54	47	45	54	61	70	69	69
Queenstown (4)	87	88	92	88	80	70	64	69	79	82	86	86
	40	43	50	45	39	37	31	31	34	40	38	37
<u>Mean diurnal range</u>												
East London (11)	18	18	18	19	24	26	27	24	21	17	17	17
Queenstown (4)	47	45	41	43	41	33	33	36	45	41	48	49

Source: W.B.19. Years of record in brackets.

Mean values of relative humidity are, as is usual, highest at night at East London. The variations in mean diurnal range throughout the year are unusually interesting. Values begin to drop at about 5 or 6 o'clock in the morning, and reach their lowest at between 11 a.m. and 2 p.m. The mean diurnal range is greatest in winter (July: 27 per cent), and least in summer (December: 17 per cent). The months with the greatest mean diurnal range (over 24 per cent), May to August, show an interesting feature in the evenings. From 7 p.m. to 10 p.m. there is a secondary maximum in the values

EXCESS OF EVAPORATION OVER RAINFALL AT FORT MURRAY

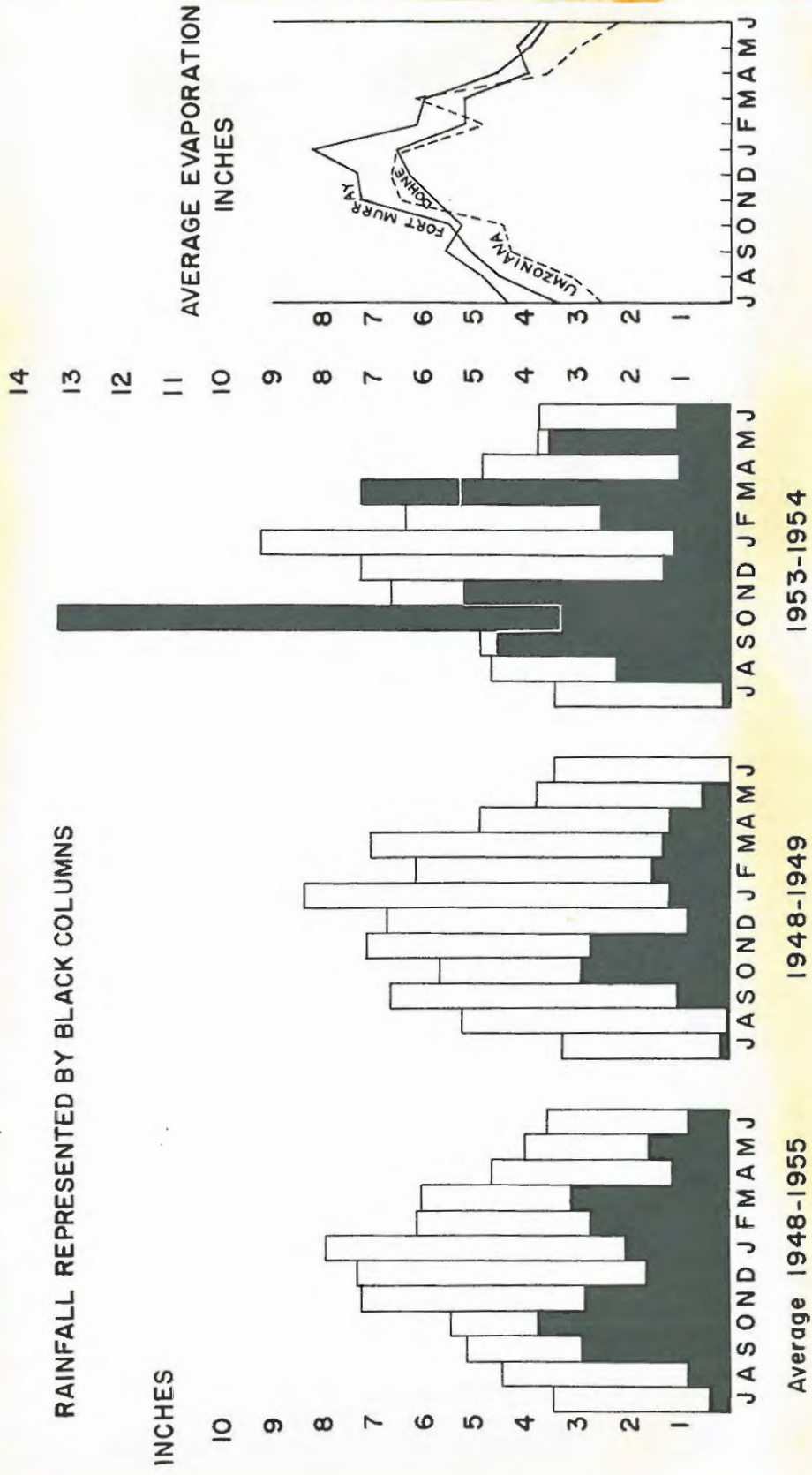


FIGURE 5

of relative humidity. It is suggested that this phenomenon may be related to the tendency to evening rainfall mentioned below, and that it is noticeable in winter because of the general dryness of the air in that season. It is unlikely that sea-breezes are responsible for this small rise in relative humidity, as sea breezes are not noticeable at East London in winter, and would not blow at this time of day.

(f) Evaporation

Owing to the higher temperatures generally prevailing inland, the gross evaporation, as measured from a free water surface, increases towards the interior. It is important to note that the figures given here apply to the capacity of the atmosphere to absorb water vapour, and not to the evaporation actually occurring from the soil, nor to evapo-transpiration from soil and plants. Variations in the rate of gross evaporation from month to month, and from year to year, are closely dependent on such climatic variations as the extent of cloud or sunshine, and ^{basically} on the variations of insolation, temperature, wind and relative humidity. Evaporation is normally greatest when berg-winds are blowing, and is least during cloudy, cool, wet periods.

The excess of evaporation over rainfall at Fort Murray, in the Buffalo River valley below King William's Town, is given in Figure 5, together with average evaporation there and at a coastal station, and at Dohne, inland. Evaporation

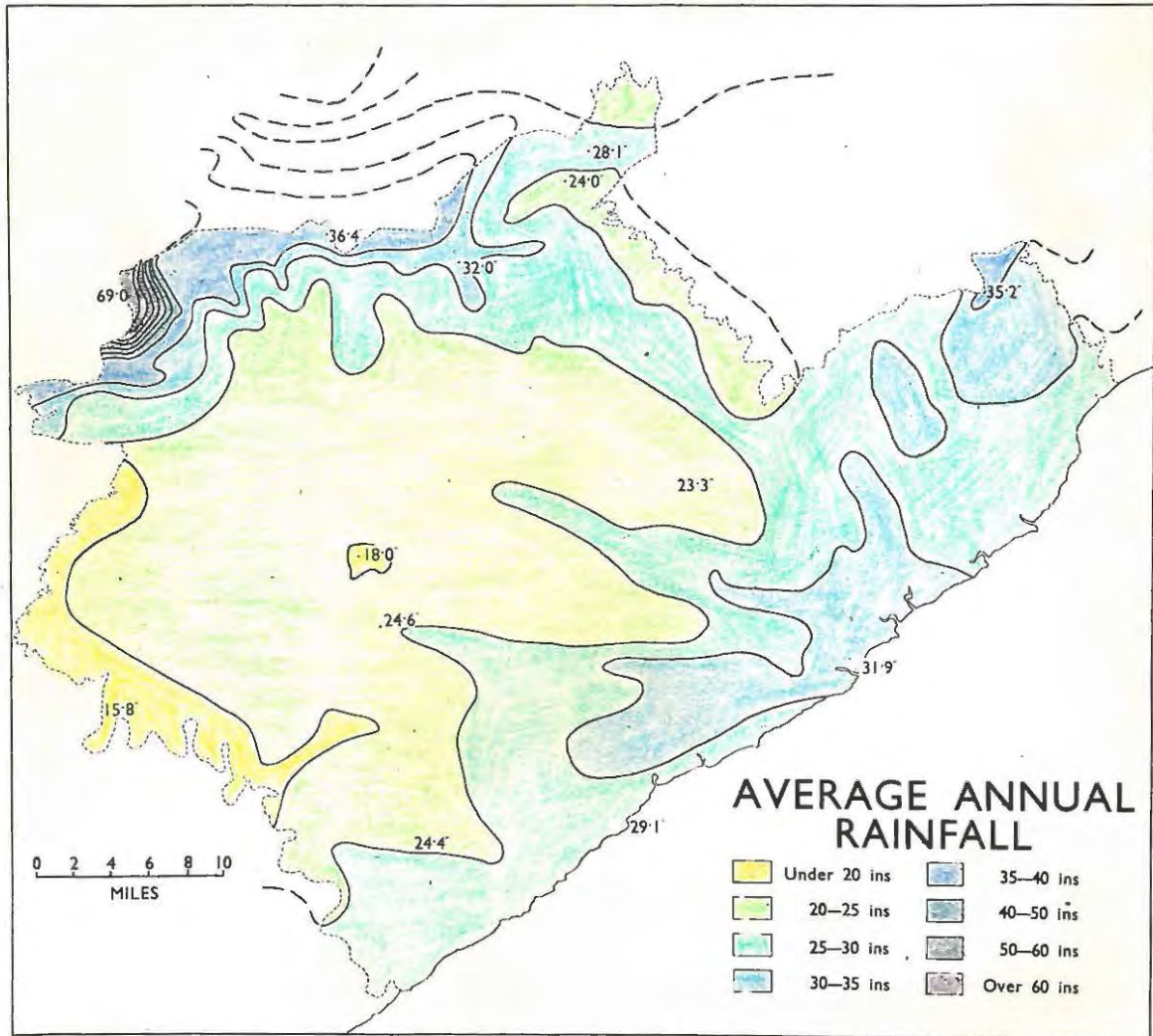
is less on the coast in the winter half-year, but appears to be somewhat greater in summer than at the upland station of Dohne. At Fort Murray, evaporation in summer is higher than at the other two stations. More than 15 inches are lost by evaporation at Fort Murray in the two summer months December and January combined. Since Fort Murray lies next to the Laing Dam, it is of interest to note that the evaporation figures there must bear a close relationship to the loss of water from the surface of the dam¹⁴. December and January show the greatest excess of evaporation over rainfall. This is partially the cause of frequently poor maize crops, as this is the period of fertilization. Even in a wet season, such as 1953-54, rainfall exceeded evaporation only in October and March. These months, with September, are the ones during which evaporation excess is normally least.

V. RAINFALL

(a) Mean Annual Rainfall

The mean annual rainfall in the Border Region ranges from 15 inches in the middle Keiskamma River valley to 69 inches at Evelyn Valley in the Amatole Mountains. In passing it should be noted that at Evelyn Valley the rain gauge overlooks the valley from a height of 3,800 feet above sea level. Rainfall over 40 inches is, however, confined to a small area in this vicinity, and the greater part of the two districts has from 20 to 35 inches (see Map 7). From the

MAP 7



rainfall map of the Union, published by the Irrigation Department in 1945, it is apparent that in general the rainfall increases north-eastwards from Port Elizabeth through the Border Region, but that this general trend is obscured by local variations. Increase in this direction corresponds to an increasing proportion of rainfall in the summer half-year. The detailed pattern of rainfall distribution within the Border Region itself is marked by several features, and these reveal the importance of local factors¹⁵. There is a general tendency for rainfall to increase north-eastwards in a coastal zone some 10 miles wide, but the rainfall north-east of East London is slightly less at the coast than a few miles inland. In the south-west corner of the region the rainfall is under 30 inches, but much of the pineapple belt and the East London neighbourhood receives more than 30 inches, (East London, 31.9 inches); the coast to the north-east has a little under 30 inches a year (Gonubie Mouth, 29.6 inches), with an increase away from the coast to just over 35 inches between Mooiplaats and the Kwelera River, 8 miles inland. Behind this coastal zone a large part of the interior of the two districts has less than 25 inches; this drier inland area includes most of the Bantu reserves, and is mostly land below 2,000 feet.

Inland the influence of relief is particularly important. The deeply entrenched valleys all have less than the

intervening ridges, so that there are drier and wetter zones transverse to the trend of the coast. This is clearly seen in the Keiskamma River valley, which has under 20 inches for some 20 miles until the wetter coastal zone is approached, Line Drift having 15.8 inches. Below King William's Town in the Buffalo River valley, the rainfall diminishes to 18 inches at Farm 135. The Gonubie River valley, between the Great Kei Road and Slippery Drift, has less than 25 inches, although that amount is exceeded on both sides of the valley. This may well be true of the upper Kwelera River valley, just outside the region, and certainly of the Kei River valley to the east. The flat intervening ridges generally receive between 2 and 5 inches more rainfall than the valleys, and as these tend to widen inland, the valleys appear as relatively narrow dry zones. The deepest parts of the valleys often have a more xerophytic vegetation than the sides of the valleys on either side, but on north-facing slopes precipitation effectiveness is much lower, thus encouraging the growth there of aloes and of other succulents. The valleys as a whole tend to be bush-covered, in contrast to the prevailing grassveld of the flats above.

The wettest part of the region is the highest part, where the Evelyn Valley rain-gauge is exposed at the top of a steep 2,000 feet rise, facing south-east. Its very high rainfall is principally due to forced ascent of moist polar and

sub-polar air-masses, while the frequent occurrence of mist there is more probably connected with the ascent of moist but stable tropical maritime air from the south-east. The importance of the Buffalo River as a water source mainly depends upon the high rainfall of this small mountainous area, below which the rainfall soon drops to under 25 inches. The most abrupt transition in the region from high to low rainfall occurs between Evelyn Valley (3,800 feet) with 69 inches a year, and Braunschweig (1,500 feet) in the Buffalo River valley barely 8 miles away, which has only 22.3 inches.

(b) Seasonal distribution

The Border Region is situated in the transition zone between the winter rainfall area of the south-western Cape and the true summer rainfall area of the rest of the Union, and is thus liable to receive rain at all times of the year. The percentage of the rainfall falling in the summer half-year, October to March, ranges from under 60 per cent near the Keiskamma River mouth to about 70 per cent in the Amatole Mountains, in the average year. The proportions are roughly balanced in the Bathurst district, some 80 miles south-west of East London, and there is a gradual increase in the proportion of summer rainfall both north-eastwards along the coast, and northwards to beyond the Amatole Mountains. Figures for some stations are given in Table 16. This decrease southwards in the proportion of rainfall occurring

in the summer half-year, as well as the general southward diminution of annual rainfall from the Transkei to beyond the Border Region, appears to be due to a large extent to a decreasing frequency southwards of invasions of warm, moist tropical air¹⁶.

Table 16

SEASONAL VARIATION OF RAINFALL IN THE SOUTH-EASTERN COAST

BELM

Percentage of normal annual rainfall, 1921-50, occurring in various seasons

	Summer (D.J.F.)	Autumn (M.A.M.)	Winter (J.J.A.)	Spring (S.O.N.)	Autumn and spring com- bined	Oct.to March
<u>COASTAL STATIONS</u>						
Port Elizabeth	18	26	26	30	56	48
Port Alfred	22	26	20	32	58	54
East London	26	28	15	31	59	63
Cwebe (Transkei, S. 32°14', E. 28°54')	32	27	12	29	56	68
<u>INLAND STATIONS</u>						
Peddie	26	29	14	31	60	63
Fort Grey	26	28	13	33	61	65
King William's Town	30	29	11	30	59	69
Lenye (S. 32°43', E. 27°03')	33	28	10	29	57	69
Evelyn Valley (S. 32°43', E. 27°23')	35	24	10	31	55	71
Woolhope (S. 32°43', E. 27°50')	32	27	10	31	58	70
Butterworth (Transkei)	34	26	9	30	56	73

Source: Climate of South Africa, W.B. 19.

A characteristic feature of the rainfall in this area is the extent to which it occurs in spring and autumn¹⁷, as indicated in Tables 16 and 17. This phenomenon is general in the coastal belt from the Kei River to beyond Port Elizabeth, and Fort Grey, 8 miles west of East London, with 61 per cent of its total rainfall in the combined periods March to May and September to November, appears to exhibit it to the greatest extent. There are rainfall maxima in March and in the case of East London in October. Towards the Transkei, as well as northwards, the proportion falling in the summer quarter, December to February, increases, and soon exceeds that of the spring or autumn, as is the case of Evelyn Valley within the region.

Table 17

EAST LONDON, MONTHLY RAINFALL

	J	F	M	A	M	J	J	A	S	O	N	D.	Year
Mean monthly rainfall (in.)	2.9	3.0	3.8	2.7	2.2	1.4	1.4	1.7	2.7	3.6	3.4	3.0	31.8
Average number of days with 10 mm. (0.4 ins.)	2.0	2.0	2.6	1.6	1.2	0.9	0.7	1.1	1.7	3.5	2.8	3.0	23.1
Percentage probability of rain on any day	35	37	38	27	19	15	13	18	27	35	35	35	-

Sources: Climate of South Africa, W.B. 19, period: 11 years percentage probability from Weather Bureau Calendar, 1957.

The combination of a relatively wet spring and autumn with a drier summer has important consequences for agriculture. The main growing period for summer cereal crops is relatively dry, although spring rains are usually adequate to soften the ground. The daily water requirement of maize increases rapidly up to the tasselling stage, and remains at a maximum for a fortnight afterwards. Fertilization takes place then, usually in December or January, and frequently fails under dry conditions. Winter crops such as wheat, oats and barley, are handicapped by the generally dry winters while the warm moist period for maturing, encourages the growth of rusts, and make the Border Region unsuitable for these as grain crops. Thus the climate of the area is not as well-suited to cereals as is that of the winter rainfall area of the Western Cape, or the true summer rainfall area northwards. Apart from the cultivation of crops with special requirements, and of forestry in the wetter parts, the area is best suited to pastoralism. This is not because there are especially favourable climatic conditions, but rather because other pursuits are not so profitable.

A relatively dry January is an attraction for those who come to East London for their annual holidays. It can be noted in passing that Port Elizabeth has a drier holiday season than East London, having an average of 16.4 rain-days as opposed to 23.6 rain-days in the period December-January, while

Durban, in addition to being wetter than both, has more oppressive summer weather. Comparison between the three centres is made in Table 18.

Table 18

NUMBER OF DAYS WITH RAIN

	J	F	M	A	M	J	J	A	S	O	N	D	Year
Port Elizabeth (14)	8.3	7.5	8.1	7.5	7.6	7.5	7.5	8.6	9.6	10.5	9.1	8.1	100.6
East London (11)	11.5	11.0	11.5	8.1	6.2	4.5	3.5	5.8	9.3	12.6	10.3	12.1	106.4
Durban (15)	12.7	11.7	11.9	9.4	5.3	3.9	3.9	6.6	8.5	13.3	14.9	14.1	116.2

Year of record in brackets. Rain days with at least 2 mm = 0.08 ins.

Source: Climate of South Africa. Weather Bureau, W.B.19.

(c) Diurnal variation

Diurnal variations in rainfall at East London disclose a tendency for rain to occur more frequently, in the evenings, between 6 or 7 and 10 o'clock, than at other times of the day. This tendency is well marked in all months except in March and April, when late morning rainfall is more common than in other months, and in July, when rain in the early hours of the morning appears to be most frequent. This does not mean that more rain is measured during the night than during the day, there being in fact no easily recognizable pattern of diurnal variations in amounts. The indications are that precipitation

here is to some extent more effective by reason of this evening rainfall tendency, than would otherwise be the case.

(d) Intensity of rainfall

Another aspect of rainfall is variation in the intensity of precipitation, information with respect to which is available for the Union, in the form of maximum falls of rain in 15, 30 and 60 minutes.¹⁸ The Border Region does not normally suffer the highly concentrated downpours of rain which sometimes occur in Natal, where Durban has recorded 1.74 inches in 15 minutes. One of the heaviest falls in the Union, however, took place at Evelyn Valley in October 1917, when 13.2 inches of rain was recorded in 24 hours¹⁹. In October 1953 the coast between Hamburg and East London experienced an exceptionally severe storm, and 12.3 inches was recorded in 24 hours at East London (Signal Station). The rain was probably of greater intensity at Farm No.69 Richmond, to the west of East London, where the total for the month concerned was 6.1 inches more than that at East London.

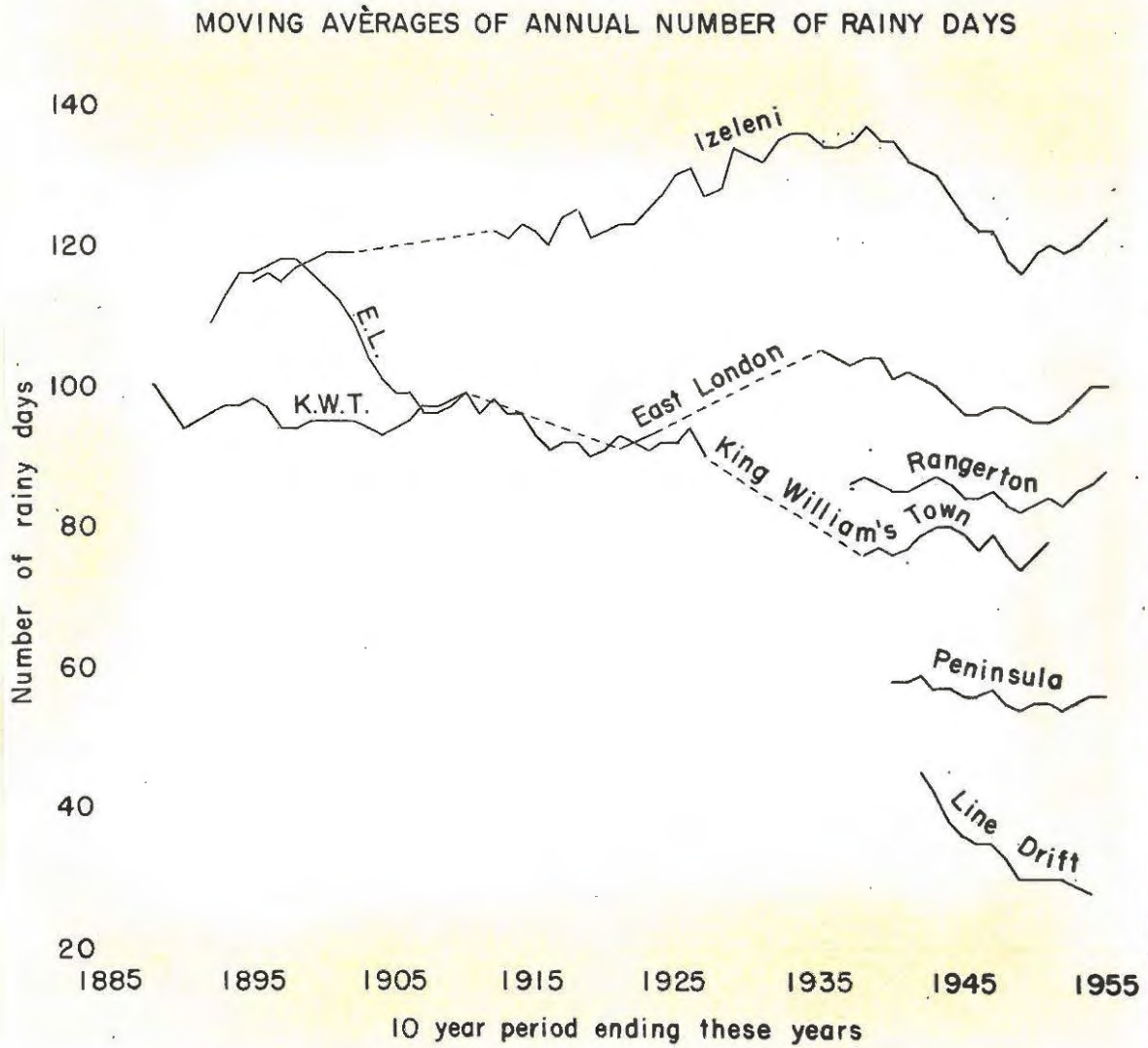
From the figures available it appears that the percentage of the mean annual rainfall expected to fall in 24 hours, varies inversely with the mean annual rainfall. Once in 100 years King William's Town can expect a quarter, and once in 30 years a fifth, of its mean annual rainfall in a day. On the other hand Evelyn Valley can expect only 16 per cent in a day once in 100 years. The danger of soil erosion from

excessively heavy downpours of rain is therefore greater at King William's Town.

(e) Rain days

Figure 6 summarizes some of the data for places in the survey area, and shows, by means of smoothed curves, cyclic changes in the number of rainy days in each year. The value plotted against each year represents the mean for the previous ten years. In this way the effect of exceptional years, and possibly inaccurate records, is minimized. This diagram shows that there are changes in the character of the rainfall, and is a rough indication of the way in which precipitation occurred. It is frequently stated, chiefly by farmers, that the character of the rainfall has changed, being previously in the form of gentle, prolonged showers, but now more often in the form of heavy storms with increased run-off. There are however contradictory opinions. At a Water Court at Alice recently, a witness stated his opinion that run-off into rivers and dams had decreased on account of the increasing prevalence of light prolonged rains, instead of the downpours which had previously provided a good water supply. To enable one to say that light, soaking rains are no longer as frequent as they were, it would be necessary to study individual falls of rain, which is not generally possible with the records available. An increase in the number of rainy days, however, suggests that there are now more frequent light, soaking rains.

FIGURE 6



Moving averages of number of rainy days

Table 19

NUMBER OF RAINY DAYS

	Years recorded	Average recorded	Highest recorded	Lowest recorded
Isidenge	72	124	159(1917)	95(1945)
East London	67	102	132(1897)	75(1920 & 1945)
King William's Town	67	90	114(1893)	60(1931 & 1945)
Rangerton	28	86	106(1929)	70(1945)
Peninsula	25	57	74(1934)	41(1931)
Line Drift	22	36	65(1933)	18(1954)

The curves on Figure 6 by no means show similar trends at all recording stations. The great differences in the average number of rainy days are broadly related to differences in mean annual rainfall. There is a widespread indication of a decline in the number of rainy days from the 1930's to a minimum in the 1940's, with an increase in the early 1950's. The peaks in the curves do not however coincide. There is no noticeable peak in the 1930's for King William's Town, as there is for Isidenge and East London. Both East London and King William's Town, however, have indications of a period of years with more wet days in the first decade of this century. On the other hand the increase in the number of wet days experienced at King William's Town in the 1890's is insignificant when compared with those years at East London, while the

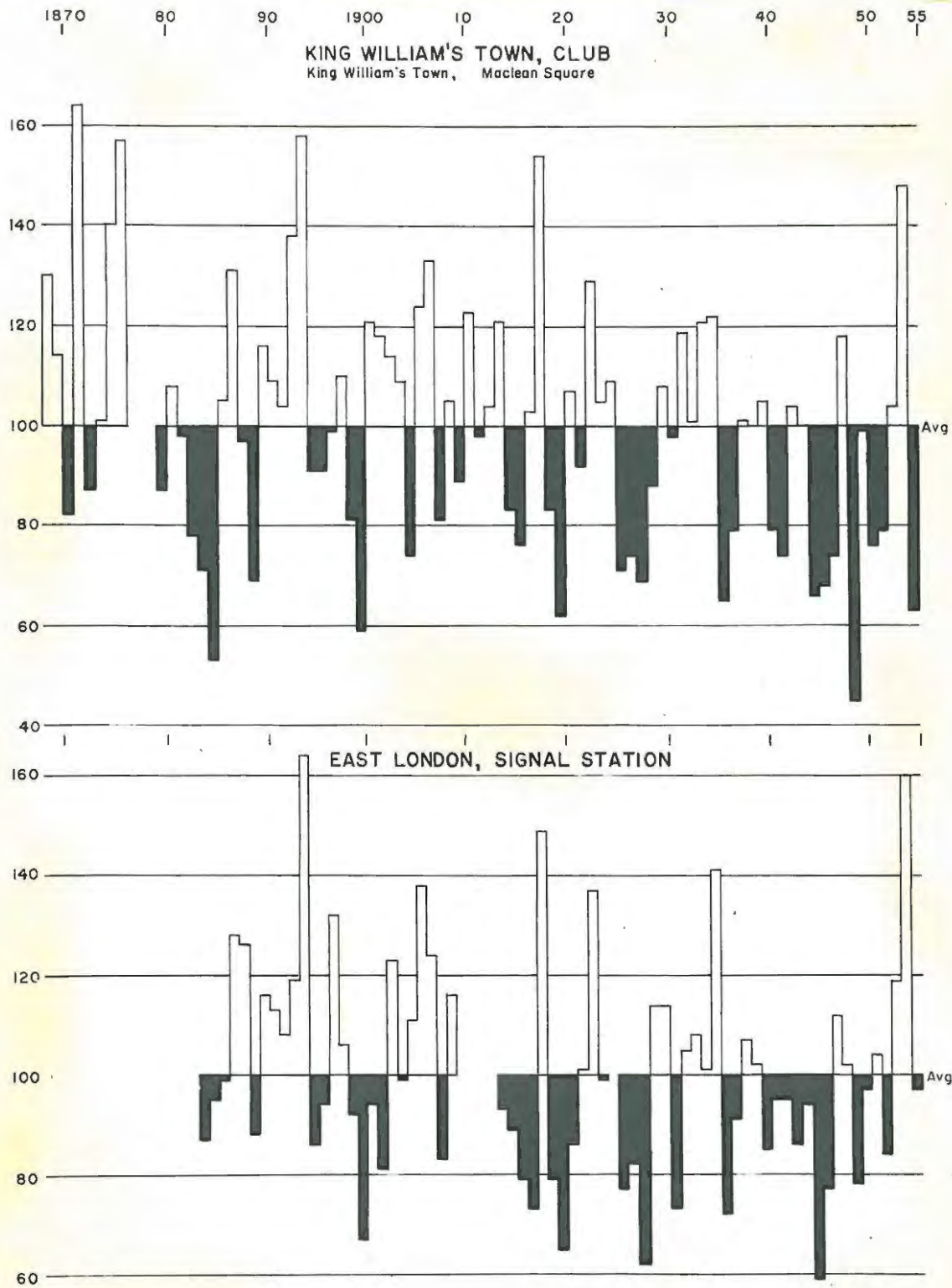
curve for Isidenge in the 1890's does not show any outstanding increase in the number of rainy days for that station.

It appears that most of the observable trends for places quite near together are not closely similar, and are therefore not of any broad regional significance. The general decline in the number of rainy days in the 1940's has now been reversed, but there is no reason to assume that years with many wet days will not be recorded again. The record as a whole is in fact too short to show any definite and periodic cyclic changes in the number of rainy days. It can be confidently stated that there is no permanent trend towards a reduction of the number of rainy days.

(f) Rainfall reliability

The annual rainfall of the Border Region is usually considered to be unreliable, though it is not much less reliable than in the South-Western Cape, where the greatest reliability in South Africa is encountered²⁰. Within the region the driest parts have the least reliable rainfall, and the reverse of this is generally true. The mean variability at six stations in the area was calculated for the period 1928-55, and is given in Table 20.

FIGURE 7



PERCENTAGE SEASONAL (JULY-JUNE) AVERAGE RAINFALL BETWEEN
1868-9 & 1954-5

Table 20

RELIABILITY OF RAINFALL FOR THE PERIOD 1928-55

Station	Mean annual (inches)	Mean variability %
Line Drift	15.8	22.7
Bell Rock	25.1	16.0
King William's Town	24.4	15.5
East London	31.9	14.4
Isidenge	36.4	13.8
Rangerton	28.1	13.3

Mean variability is the average departure from the mean annual rainfall.

The figures show that the rainfall of stations in the Border Region on the average differs from the mean by 14 to 20 per cent, either above or below the mean. This order of variation is fairly often exceeded in individual years, and as much as 164 per cent and as little as 45 per cent of the mean rainfall has fallen at King William's Town. From figure 7, which gives the percentage of the mean rainfall for the last nine decades, the year being taken from July to June, it is possible to detect two distinct periods at King William's Town, a wetter one prior to 1925, and a drier from about 1925 to 1955, but each period has its share of particularly dry and of particularly wet years. The dry years 1914-1915 and 1918-1919 during the first period, and the three wet years in the early thirties during the second period, are typical of the considerable fluctuations within what may be a general trend in the rainfall. At East London also, a dry

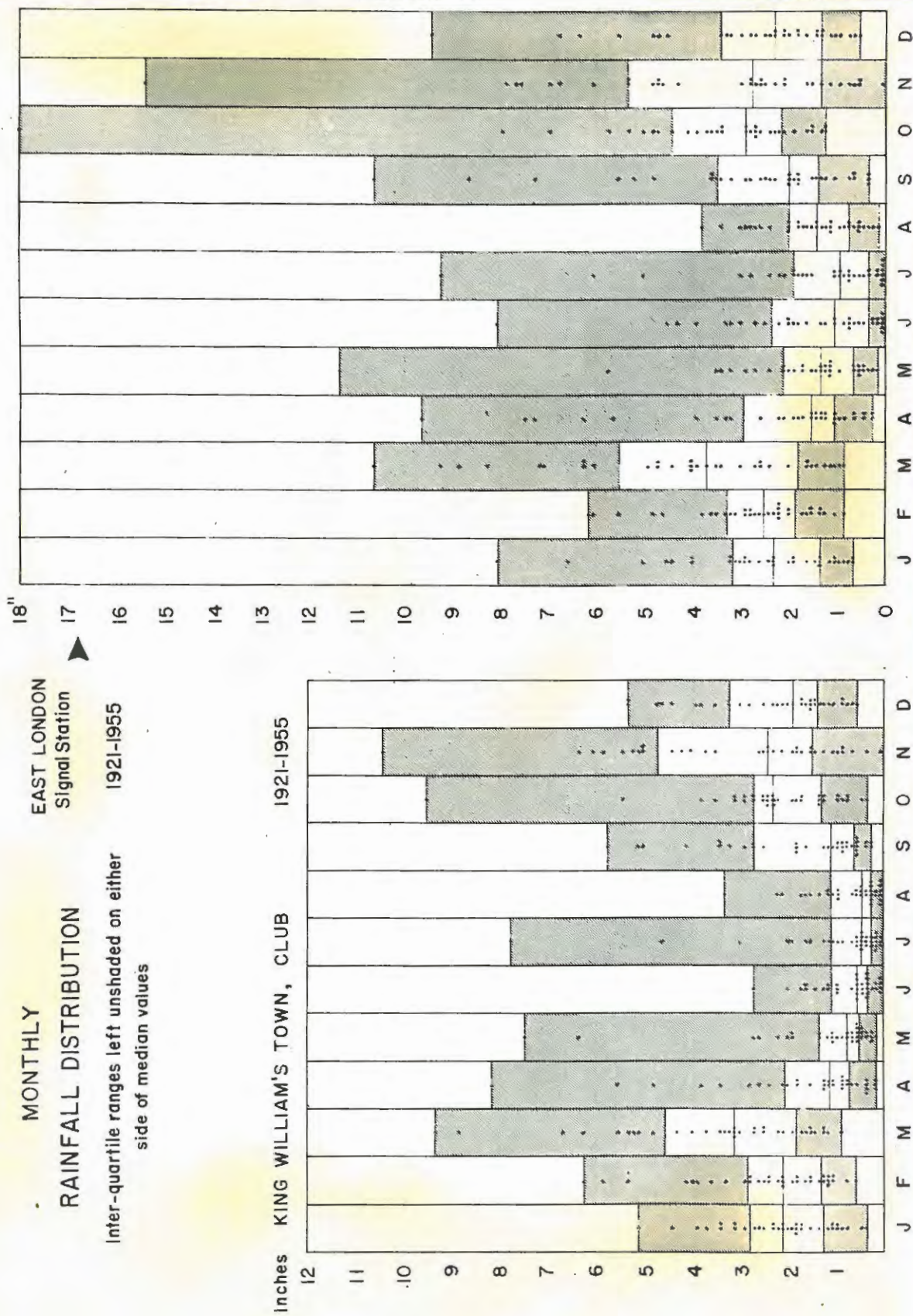
period follows a wetter one, but the period of drier years started some ten years earlier than at King William's Town. Rainfall was first measured in King William's Town in 1867, and before that there is only documentary and literary evidence of dry spells. It seems that during the 1840's the country suffered from many droughts²¹, and the German Legion faced four years of drought between 1859 and 1862²², so that the drier period of the past 30 to 40 years is not necessarily a permanent trend.

During times of general drought, when water supplies and grazing were limited, the semi-nomadic pastoral Bantu moved to where conditions were better, and in 1841 and 1842 some were allowed to move into the Cape Colony to graze their stock in the Bathurst district. It is believed that much of the pressure by the Bantu on the frontier at that time was caused by distress arising from drought²³. After the area was settled by White farmers, and the indigenous population was confined to tribal locations, movement of livestock became more difficult, and the effects of drought became magnified. Droughts are now associated with crop failure and shortage of fodder, and with overgrazing and soil erosion. At these times the East London area often has to be supplied with lucerne fodder from the irrigated areas in the Upington district of the north-west Cape Province. There is often a marked decline in dairy produce, and an increase in the supply

of hides and skins from dying or slaughtered livestock.

The driest agricultural seasons (years from July to June) when the Border was very seriously affected, were 1884-5, 1899-1900, 1919-20, 1927-28, 1935-36, 1944-45, 1948-49, years which will long be remembered as years of regional disaster. The last one, coming before the completion of the Laing Dam, exhausted the domestic water supply of East London. The city had grown rapidly since the end of World War II, so that water consumption had outstripped the resources. As the drought reached its climax in 1949, water was being regularly shipped to East London from Durban in a tanker hired by the City Council. At the time of the survey, the Border Region was experiencing another drought which, however, was felt much more acutely outside the Border Region. Grahamstown had started to ration water by the end of the winter of 1956. The Border press almost daily carried reports of the drying up of stock dams, and domestic water supplies during the latter part of the preceding summer. The conditions were aggravated by the high frequency of berg winds with their high temperatures. The Bantu maize crops were very poor indeed, and their livestock was in poor condition; five dairy schemes in the Reserves were forced to stop functioning because of the drought. Water for irrigation was in short supply, as there had been little run off, and streams were generally low. Crops such as lucerne, and pastures grown

FIGURE 8



under irrigation, were being burned up by the hot weather even in March. Some pastures in the Kei Road district had to be replanted after the winter.

Some idea of the probability of either low or excessive rainfall may be obtained from Figure 8, a rainfall dispersion diagram for the two towns of the Border Region based on the monthly figures for the period 1921-1955. This period coincides roughly with the drier period of recent years, but the considerable variations from month to month and year to year are shown up very clearly, each dot representing a ~~recorded~~ mean monthly rainfall during the period. The space between the maximum and minimum values for any one month is subdivided into four sections, each containing the same number of dots. The record for King William's Town shows that for six months (April to September) half of the monthly rainfall totals were 1 inch and below, and that for the three winter months (June to August) half were below 0.5 inches. The picture for the other six months is little better, since it is then much hotter, for half the totals are below 3 inches except in March. The great variation of rainfall in autumn and spring is a feature of both stations. July also experiences great variation, owing to occasional rainfall spreading from the Western Cape, though it is usually dry in this month. The summer months do not in general have the wide fluctuations of the spring and autumn months.

The record at East London shows much wider fluctuations. A quarter of the monthly totals are below 2 inches for all months except October (which is below 2.2 inches). During the period only October had 18 inches, including 12.25 inches on one day. The inter-quartile range is greatest, and reaches highest figures, for March and November at both places, which indicates that there is a stronger probability of good rains in these months than in any others.

There is nothing in this study of rainfall reliability to suggest that there has been any progressive change in the rainfall of the area. This is in conformity with the conclusion reached by Kokot³.

(g) Hailstorms

Local heating and convection in moist air-masses, particularly in summer, is responsible for occasional hail storms in the Border Region, but the average number in the year is small in comparison with that of the interior of the country. The increase inland is noticed within the Border Region itself, one of the evidences of increasing continentality of climate. In passing it may be noted that it was formerly supposed²⁴ that hail was more common in the Eastern Cape than in Natal, but recent statistics show this to be a doubtful claim.

From average figures²⁵, East London has less than one day with hail each year. Lovedale, in a situation comparable

with that of King William's Town, has 1.3 days. This is to be compared with interior stations such as Queenstown, which has 3.3 days, and Barkly East, above the Great Escarpment, which has 6.6 days a year. In the interior most hail occurs in summer, but in the Border Region the occasional falls of hail are often in spring or autumn when contrasts in temperature between different air-masses, and between them and the heated ground surface, are greatest. June, July and August are usually free from hail.

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Autumn - March, April, May.
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22. Schnell, E.L.G., For Men must Work, Maskew Miller, Cape Town, 1954, and contemporary reports in the King William's Town Gazette.
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the lowlands of Natal or the Eastern Cape.
25. W.B. 19.

Chapter 7

SETTLEMENT

HISTORICAL

In earlier times the area was sparsely inhabited by tribes of Bushmen and Hottentots. These people have either died out or been absorbed by the Bantu, leaving no distinct impress upon the landscape. Many place names, however, are believed to be of Hottentot origin.

Prior to the end of the eighteenth century Bantu from the north-east had established themselves in the Border Region. The dispersal of White colonists from the west led to contact with them, which the Dutch East India^{Company} attempted to regulate, by fixing a boundary along the line of the Great Fish River in 1780. Friction between the two groups was not prevented by 'placaats' forbidding intercourse and trade with the Bantu, though effective settlement by Dutch colonists was halted at the Great Fish River. The territory east of the Keiskamma River was occupied for a time solely by Bantu, leaving a disputed territory between these two rivers, into and beyond which the Bantu penetrated at times. The western vanguard of the Bantu having been expelled from the Zuurveld (Albany and Bathurst districts) twice, in 1781 and in 1812, was again driven in 1819 not only from that area but from the area between the Great Fish and the Keiskamma Rivers, which became known as the Ceded Territory or Nōmansland. The provision

of this neutral zone, however, did not prevent friction between the Bantu and the colonists, now augmented by the 1820 British Settlers. There was penetration from both sides, and the state of affairs on the frontier rapidly grew worse, being marked by cattle raids and resultant punitive measures, the general unrest creating a sense of insecurity amongst the colonists in the frontier districts and profoundly disturbing the colonial administrators. For nearly 30 years until the creation of British Kaffraria, there was a succession of Governors, variously interpreting the situation, and acting without the backing of a consistent policy on the part of the Colonial Office in London. During the Kaffir War of 1834-35 not only was the Ceded Territory temporarily annexed, but a Province of Queen Adelaide was established beyond it from the Keiskamma River to the Kei River, only to be abandoned in 1836, its headquarters at King William's Town foreshadowing the later capital of British Kaffraria.

The appointment of Sir Harry Smith as Governor of the Cape Colony in 1847 was in effect a ~~revers~~ion to the policy of 1835. The Ceded Territory was finally annexed to the Cape Colony, and the adjoining territory as far east as the Kei River and northward to the Klipplaat river was declared a separate dependency under the Crown with the name of British Kaffraria. Thus in 1847 there commenced the shaping of the former tribal lands of the Border towards the present pattern

of settlement, for from then the tribes were to hold reserves allocated to them by the Sovereign. The reserves that were established in British Kaffraria are substantially the same as the Bantu areas of today, and the division of the country *between* reserves and what became White farmlands, so characteristic of the Border Region in its wider sense, was thus brought about. For the control of the territory, military posts and forts were established at strategic points, with King William's Town as headquarters. East London was established as a port of entry at the mouth of the Buffalo River, though annexed to the Cape Colony to avoid customs difficulties. While there were a few military villages in the Tyumie River valley next to the colonial boundary, no settlement of colonists was to be permitted. Both Sir Harry Smith and his successor, Sir George Cathcart, were opposed to settlement of a Native territory by White people, mainly on the strategic grounds that it would simply mean further expansion, war and a renewal of the problem. Nevertheless, as a result of the 1850-53 Kaffir war, when the rebellious Gaika tribe was dispossessed of the Amatole forests, and friendly tribes were concentrated along the colonial boundary, the Keiskamma River, Cathcart declared the Amatole Mountains to be a Crown Reserve (see Map 8), which was to be peopled partly by White settlers and partly by Fingoes, though in villages only. He was opposed to the "lavish waste of country"¹ which large farms occupied

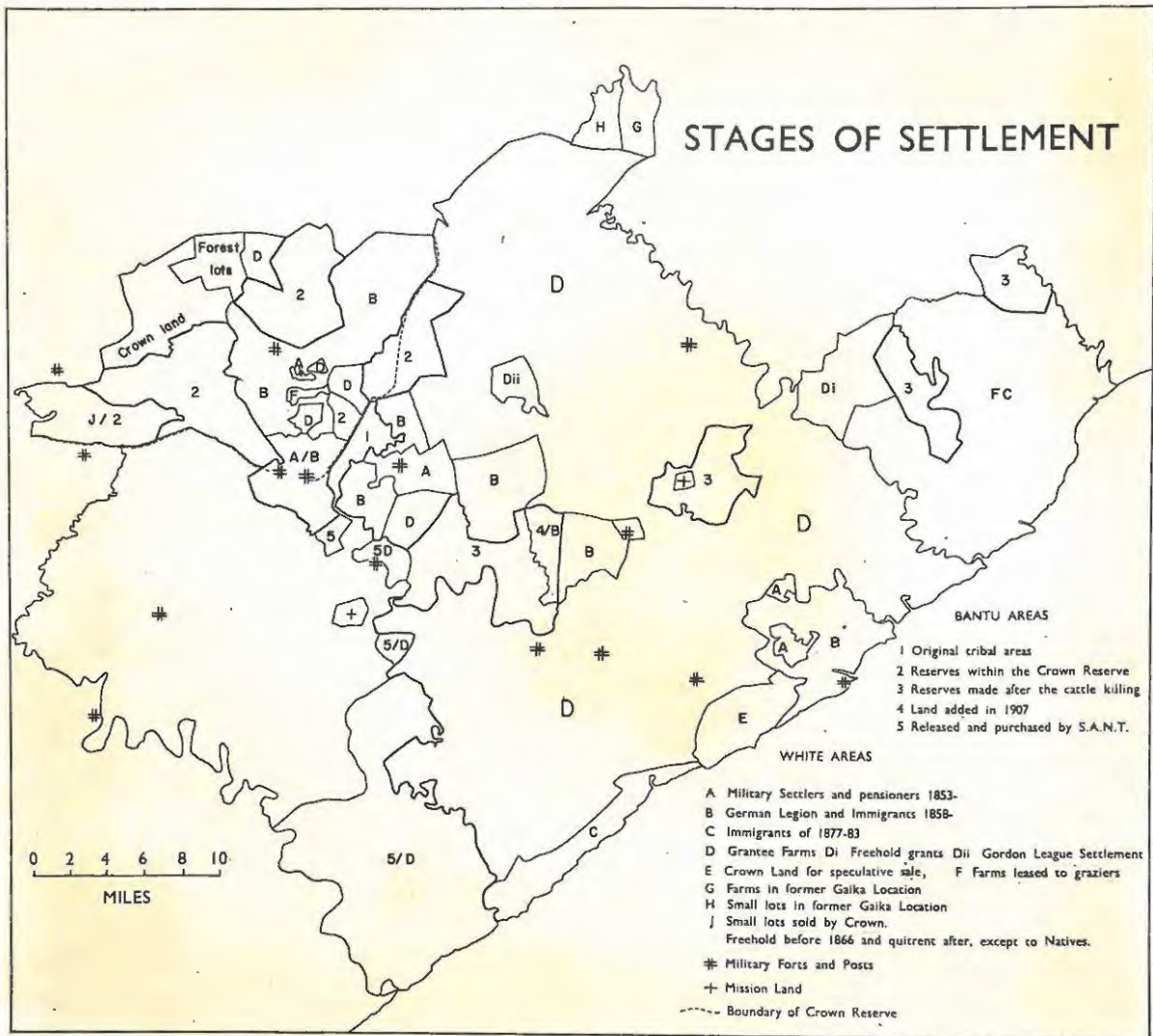
by single families would have entailed, and wished to exclude land jobbers who frequently bought up farms abandoned because of lack of labour.

Sir George Grey, who took office as Governor in 1854, was the last governor to have a major part to play in establishing the main outlines of the settlement pattern of British Kaffraria. He abandoned the policy of treating the frontier entirely as a military problem, and was responsible for the inauguration of a policy of civilizing the Bantu. He had followed the same principles, as Governor of New Zealand, in dealing with the Maoris. The Bantu tribal reserves were left as Cathcart had planned them. Military pensioners and discharged soldiers were encouraged to settle within the dependency, and, because they were slow in coming forward, Grey obtained a draft of volunteers from the German Legion in 1857². The locations of these groups of settlers were to a certain extent governed by strategy. The forts were to act as nuclei for settlement, the civilization of the Bantu proceeding thence by contact with the White inhabitants. The "stations" of the German military settlers were along two lines, one inside the colonial boundary, to reinforce it along the Keiskamma River, and the other along the new east bank road from East London to King William's Town and to Stutterheim. The older road, from the nucleus of East London on the west bank of the Buffalo River, was originally prospected for sites

for the legionaries, but the construction of a shorter highway to King William's Town on the east bank side of the river altered earlier plans to the ultimate advantage of the settlements, which were placed along the shorter route.

One remarkable event which altered the land position in British Kaffraria, and which had far-reaching effects on the future of farming as well as on the whole economy of the Border Region, was the Cattle Killing of 1857¹. The details of that incident are described in Economic Development in a Plural Society. Its principal result was that the Bantu population was so reduced by famine and by dispersal, that large tracts of land were left vacant. For strategic reasons, Grey felt it necessary to remedy this by further settlement, in 1858 the first German peasant settlers arrived, and when further German immigrants could not be financed from sales of Crown land, he turned to colonists from the Cape³. The vacant country, with the exception of a coastal strip and of the country beyond the Gonubie River, was quickly settled by men who were to be fit for military service. The regulations provided for the actual occupation of farms with penalties for absence. At the same time Grey gave instructions that the tribal reserves be left sufficiently large for returning Bantu, who had sought work in the Colony or in the towns after the Cattle Killing. The existence of parts of the Newlands, Kwelera and Mooiplaats locations is due to this

MAP 8



provision.

By the 1880's the general settlement pattern of the Border Region had been established with its complex pattern of White farmlands, townships and Bantu tribal reserves, and with radical contrasts in White and Bantu rural economy. There are some modifications of the earlier pattern resulting from the purchase for the Bantu in recent times of land occupied by Whites, and current proposals of the Group Areas Board may bring about further changes. The juxtaposition of White areas and enclaves of Bantu-occupied land is characteristic of the Border Region but not confined to this part of South Africa. Similar situations occur in the Northern Transvaal, in East Griqualand and in Natal. What is probably distinctive of the Border Region, as compared with these latter areas, is the greater variety of land tenure ~~practices~~, not only as between Bantu and White ^{settlements}, but also as a result of much early experiment in White settlement. The White farming areas were surveyed before settlement, and without consistency with respect to the size of holdings and the conditions of tenure. All these conditions have their effect on agriculture and on the economic and social development of the two districts.

Map 8 illustrates the historical development of land occupation, the Native Areas being shown on a map on the scale of 1:125,000 accompanying this volume.

I. BANTU SETTLEMENT

The Bantu reserves, the larger areas of which are made up of small units called locations, fall into various categories. The first is the original tribal territory as restricted a century ago upon the establishment of British Kaffraria, largely unaltered by the Whites until the recent Betterment Proclamations began to control farming there. The original tenure was a tribal tenure of communal type. The land once vested in the paramount chief came to be vested in the Crown, now represented by the South African Native Trust. Grazing is communal over free range⁴, and the women cultivate land near their homes, every wife in the tribe having a right to land for cultivation. With the increase in population within the defined Bantu areas in the nineteenth century, it became the local Bantu headman's responsibility to allocate land for cultivation and to excise it from the common grazing⁵. By the turn of the century, L.H.G. Tainton, a location superintendent, could say that he practically had the power to give out gardens, as they were then called, "but it is usually done only on representations made by the Headmen concerned"⁶. Nevertheless the allocation of gardens or lands is still in practice performed by the headman of each location, and these allocations are recorded in the District Record Book of the Native Commissioner. Some individuals who held land on farms in their capacity as labour tenants forfeited their land in the

locations⁷. Under certain circumstances land could revert to the Government⁸.

The present-day location is an important administrative unit presided over by the headman and inkundla (council). For over a hundred years chiefs and headmen have been paid servants of the government. The individual locations within the reserves are much smaller and more numerous than they were in the past. While at first the locations corresponded fairly closely to tribal units, there was some subdivision of the larger locations during the second half of the nineteenth century. Subdivision tends to be carried further as a result of the general increase in population, and the need for a more effective administration.

A second type of Bantu area occurs in the former Crown Reserve. The predominantly Fingo population was allowed to settle on widely differing terms, sometimes intermingled with White settlers as at Mngqesha, where before 1866 they both received freehold title, though after 1866 the Bantu appear to have acquired freehold title there only to fairly small lots. The main disadvantage at Mngqesha was the lack of common grazing. The locations along the Mngqakwebe river were surveyed and the inhabitants, mostly Bantu, obtained quitrent title to the agricultural lands, with grazing still in common. Although Zeleni was scheduled as a location in 1913, freehold tenure predominates there; the inhabitants also have a small

area of common grazing, and the Department of Forestry occupies the watershed on the northern boundary. Some of the sections at Zeleni and Mngqesha have been sold to the South African Native Trust. The problems of applying Betterment Schemes to surveyed scheduled locations where quitrent tenure obtains have been overcome, but the problems are nearly insuperable where individuals own portions of land in freehold. Re-organization of the cultivated lands would require the sale of all properties before the whole area could be planned. As many of the individual holdings, both quitrent and freehold, were surveyed quickly and often in a grid pattern as at Masingata's Location, the existing holdings are not all suited to cultivation since some parts are too steep or rocky⁹.

At least three enclaves of Bantu lands are the result of reserves created in 1858 to provide for "the future wants of the former inhabitants ... who are likely to return there, selecting the localities with a view to the safety of the European population"¹⁰. It is possible that the group of locations south of Berlin was at that time reserved for the followers of chief Umhala. With the exception of Newlands, which received quitrent tenure under the Glen Grey system, they are all unsurveyed. In passing, it can be noted that Mncotsho location, south-east of Berlin, was augmented in 1907 by the addition of a portion of Potsdam commonage.

The most modern class of Bantu area is the released area

purchased from White farms by the South African Native Trust. An area of 106 square miles in the south-west of the survey area was purchased between 1936 and 1941. Further smaller tracts adjacent to other Native areas were also acquired at about the same time. Agricultural practices in these areas are strictly controlled by the Department of Native Affairs, which allows only conservation farming¹¹. Some of the smaller areas purchased by the Trust are being used for experimental agriculture including irrigation.

Two other types of tenure are encountered in the two districts of the Border Region. Only one holding of mission land in a Bantu area survives, that at Newlands. The other type, freehold farms in White areas, is more widespread. A large number of small properties east of the Kwelera River have given rise to anxiety amongst the local inhabitants and the administration during the last 50 years. It would seem that when the region was settled by Whites in the late 1870's there was a considerable Bantu "squatter" population which has never been much reduced. Some of these people later bought farms in the neighbourhood. Similarly, small allotments are owned by Bantu amongst the German settlements such as at Frankfort, Hanover and Braunschweig, and at other places such as at Sinyoka. In these localities it was the express purpose of Governor Sir George Grey to intermingle the two races "that neither of them might remain an object of dread

or apprehension to the other, but that they might become mutually beneficial to one another"¹². Without passing judgment on whether this has failed, we may note that the agricultural practices of the Bantu in these situations have not received any stimulus from the example of the adjacent German or military settlers.

II. WHITE SETTLEMENT

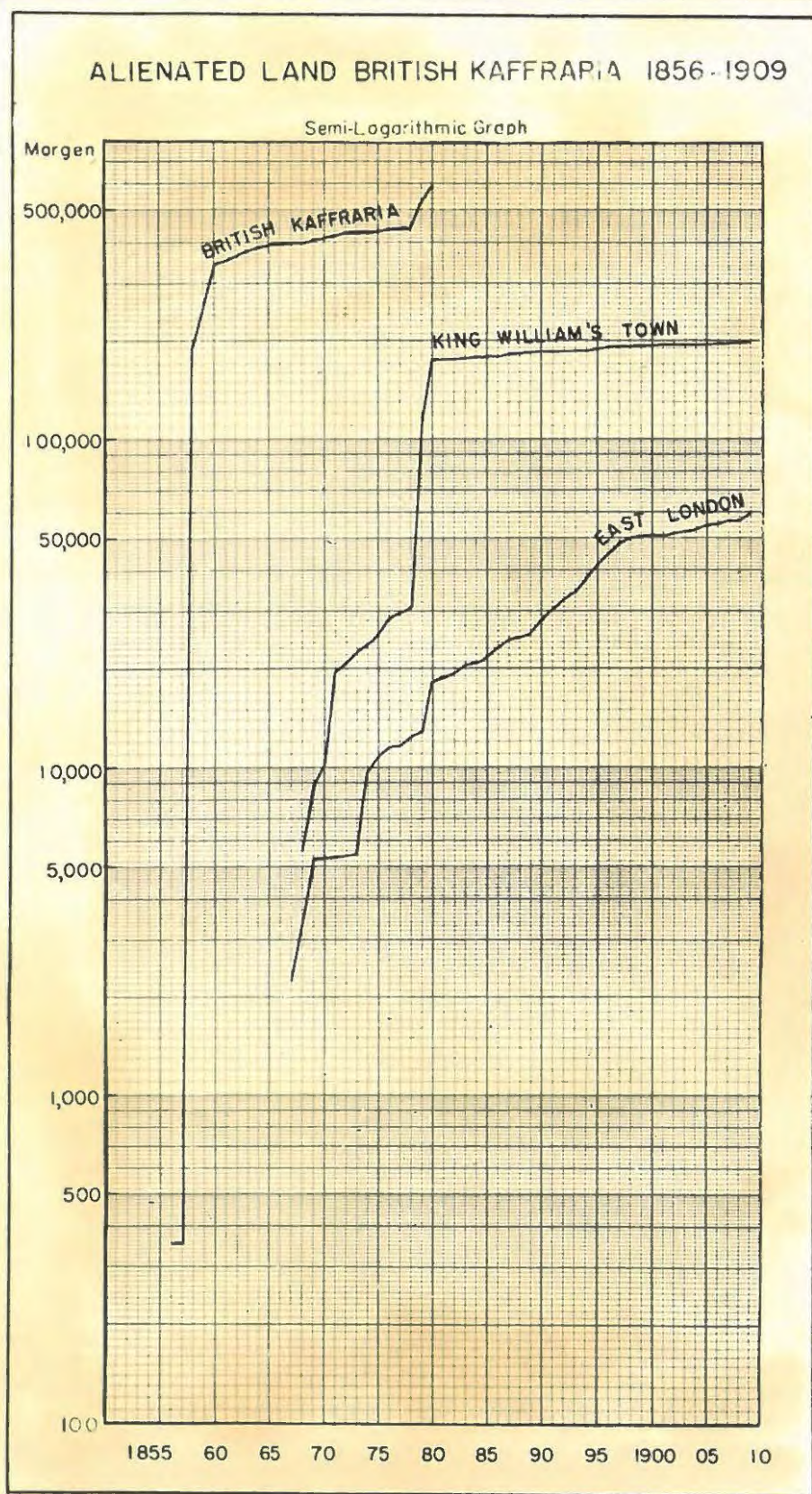
All the land in British Kaffraria became Crown Land in 1847 by right of conquest, and as required, provision was made not only for individual and communal White holdings, but also for reserves for various purposes, such as forestry reserves, outspans, public highways, and military posts. In this sense, the settlement of the region, being controlled by the Surveyors General on behalf of the Crown, was carefully planned from the start. Sometimes the planning was unsuccessful, as the surveyors had only a brief acquaintance with the country, or considered that suitability of soil and situation were not the most important factors in siting settlements.

Most of the land alienated to Whites after 1847 was given in freehold or for a small quitrent. Sometimes there were additional conditions such as the requirement of military or militia service. From time to time land was sold at public auctions, commonly so in the case of building plots in townships. In one instance quitrents, those of a

tract of farms cut out of the forfeited Gaika location in 1879, were put up to public auction. Only two of these farms, however, occur in the survey area, viz., Nos. 35 and 36 in the north-east, although much of the Stutterheim and Cathcart districts was settled in this manner.

From a study of the records of land granted and sold from 1856 to 1909, the effects of different forces on the expansion of settlement in the Border Region may be inferred¹³. Data for the two divisions separately are available from 1867. The fastest rates of alienation occur at the time of settlement, under specific schemes such as the Grantee settlements (1858-61), and the settling of the Gaika location (1878-80). In the East London division during the period 1870-73 alienation of land was very slow, whereas in the same period there was considerable expansion of settlement in the King William's Town division. It would appear that the development of the Diamond Fields after 1869 brought more activity to King William's Town, an important waggon-building and repair centre, and still the undisputed commercial capital of the divisions newly annexed by the Cape Colony. The beginning of railway construction from East London in 1872 stimulated land alienation in that division; after 1876 the rate of settlement was not so great, but increased alienation took place right up to 1897, when the imminence of the Anglo-Boer War brought this phase to an end, rates of expansion of land occupation

FIGURE 9



increasing again after 1903. The high rate of alienation in the East London division from 1890 to 1897 could possibly be associated with increased commercial activity arising from the development of gold mining in the Transvaal. There was a greater rate of land alienation than in the King William's Town division from 1890 until Union in 1910.

Table 26

LAND GRANTED AND SOLD 1856-1909 (MORGEN)

Years (inclusive)	Extent alienated between these years		
	British Kaffraria	East London Division	King William's Town Division
1856-1860	346,215		
1861-1866	48,566		
1867-1869	14,275	5,343	8,932
1870-1873	13,672	202	13,470
1874-1876	12,217	5,918	6,298
1877-1878	2,864	897	1,967
1879-1880	150,893	5,763	145,129
1881-1889		7,380	8,345
1890-1897		20,205	7,900
1898-1903		3,684	2,283
1904-1909		7,980	3,598

Sources: Annual Reports of the Surveyor General, Cape of Good Hope Colony, Returns of Land occupied in British Kaffraria, and Annexure 9 to Votes and Proceedings of Parliament, Vol.I, 1867, dd. 4th October 1866.

Communal and other close settlement

Discharged soldiers and pensioners were generally settled near the fortified military posts. This was to make possible a reduction in the number of Imperial troops, and to allow the

villages thus formed to defend themselves more easily. These settlements were located at Izeli, King William's Town, Blaney, Fort Jackson, and also near East London. Their small freehold plots were generally separate from, but were occasionally mixed with, the holdings of the German settlers. At King William's Town a pensioners' village of small plots was laid out next to the town, but in other areas the plots were generally about 20 acres in extent.

The German military settlers of 1857 were also settled near forts, sometimes enlarging existing villages. These military settlers were allotted a residential lot in the villages, a one-acre garden lot, to which was added a four-acre agricultural lot after a protest that it was impossible to make a living on an acre. They were liable to be called out for full-time military service for seven years after their arrival in the Border area.

The German civilian immigrants of 1858-62 were placed to reinforce the settlements established by the German Legion. The conditions which they accepted by contract with the British Kaffrarian government gave them more land than the legionaries had received. They were to have 20 acres of good country land for every married couple, 10 acres for single men, and 5 and 3 acres for each child above 14 and 10 years of age respectively. The land was freehold and had to be purchased at £1 an acre. They also received a "town lot" in

the village¹⁴. In a letter from the Surveyor General of British Kaffraria to the High Commissioner of that province, it was reported that each family was to receive one town lot, one suburban lot of 5 acres and one country lot of 19 acres¹⁵. This may have been making due allowance for children. At all events, the 20 acre lots arranged in blocks near the German village settlements are the characteristic legacy of these immigrants. Both the legionaries and the immigrants were allowed to graze livestock on common pasturage. This, as well as sufficient land for expansion, was set aside for them before further Crown land was surveyed¹⁶. Today the Village Management Boards and the two Divisional Councils regulate the number of livestock each villager is allowed to graze on the commonage.

There is now a movement to have the extensive commonages of some of the German settlements subdivided and distributed amongst the local land-owners. At the time of this survey the committees appointed to consider subdivision in each village had been appointed for Braunschweig and Hanover, but Berlin was reported not to want subdivision. Although subdivision was desired at Frankfort and at Potsdam, committees had not yet been appointed, presumably because of the uncertainty arising from the tentative plans of the Group Areas Board for those villages. Increasing the areas of the small farms in these settlements, by the addition of portions of commonage, will

make possible freer sales of property, as farmers will be freed from the existing restrictions on the numbers of livestock which may be put out to graze. The present provision that every land occupier has equal grazing rights irrespective of the amount of land he owns may then have to be altered.

As the blocks of individual holdings in these villages were usually arranged in rectangular fashion, they ignored the differences of soil and slope, and the variations in the quality of grazing. The holdings are frequently of very different quality and hence varying intrinsic value. As the survey of these holdings was carried out while the first settlers were waiting to be located on the land, it is clear that haste as well as strategy was a significant factor. Some of the mistakes of the early surveys were ~~not~~ repeated when it came to locating the settlers who were brought out from Germany, Scandinavia and Scotland between 1877 and 1883.

A number of Scottish settlers were located along the coast on holdings of up to 500 acres in extent. These holdings lay behind the belt of dunes on the better land, and mostly between the Keiskamma and Gulu Rivers. They had been surveyed before 1867, but by 1876 few were occupied and even fewer cultivated. They were agricultural sections, and were occupied under the provisions of Act No.4 of 1870 whereby at least a tenth was required to be cultivated¹⁷. A few more were settled between the Gonubie and Kwenxura Rivers.

Beyond the Gonubie River lies a tract composed mostly of small farms. Prior to 1876 it had been divided into 1,500 acre farms which had been leased to graziers. About 170,000 acres had been made available on five-year leases in 1872. This tract was used principally as winter grazing for sheep farmers on the Bontebok Flats (now the upper Cathcart district). Bantu were also amongst those who leased these large properties; in 1873 they leased a total of 18,667 acres in the division of East London¹⁸. A large number of Native squatters lived on these farms and worked for the Whites for about three months during the winter¹⁹. At about the same time as the Scottish settlers were introduced to the coastal area, northern European peasants were brought out to small farms or settlements on the pattern of the older German villages. The majority of the latter were settled in locations at Lilyfontein, Brakfontein, Kwelegha (Kwelera), Paardekraal and Gonubie. These small holdings were commonly about 20-30 acres in extent and were on leasehold for ten years, thereafter belonging to the immigrants on payment of survey charges and a small quitrent; these charges were waived by Act No.37 of 1885. Common grazing was set aside, but in the 1890's was subdivided and transferred to lot holders, so that most farms are larger than they were originally. Other immigrant peasants were located at van der Kemp's Location and at Tainton village. The small lots adjacent to the original 200 building lots at that village

were suited only for horticulture, and the inhabitants complained of the long way (30 miles) to the market at East London.

It has often been asserted that close White settlement on small holdings was possible in South Africa, because of the way in which the German immigrants stuck to the land and improved it²⁰. The economic survey of farms of this type²¹, which still exist in the Border Region, suggests that this is mainly due to the extreme poverty of the peasant farmers. It is worth noting that several other classes of settlers received land on much more favourable terms, which enabled them to occupy more land and to reap a better profit from their larger properties. Larger farms are better suited to a more extensive type of farming, in harmony with the natural environment.

The Kommetjes Leegte Location, south of Mooiplaats, was surveyed intentionally for squatters of Afrikaner extraction, who had lived on the original leasehold farms. It is recorded that the scheme failed as land speculators and not the squatters bought much of the property²².

The last close settlement scheme to be attempted in the two districts was at Wolseley. A farm of 3,400 acres (No.131) was bought by the Gordon League and subdivided for 20 families. English settlers, who arrived in 1886, were allowed 20 to 50 acres for agriculture and some communal grazing. The settlement failed because of cattle disease and bad prices for agricultural products. Furthermore, these settlers were not disposed to

persist in farming at a time when fabulous profits were reported to be made on the newly opened Witwatersrand Goldfields.

From an early date it was realised that the growth of East London would cause the value of land near it to rise. In the late 1850's sections of 80 acres were surveyed between Hickman's and Goda Rivers. In 1861 the Surveyor General of British Kaffraria tried to persuade the High Commissioner to allow the survey of ten-acre lots to the east of these sections, adjacent to East London. He assured the Lieutenant-Governor, Colonel Maclean²³, that they could be sold at a profit to people who did not want the encumbrance of 80 acres but just required a site for a marine villa. These 10 acre lots were never laid out, and the area remains part of the East London commonage and the site of the new Grand Prix motor racing track. Most of the 80 acre sections were leased at 1s.6d. an acre on quitrent tenure, but a few (to favoured persons) sold for £1 an acre on freehold tenure²⁴. Colonel Maclean himself had a villa on one of them near Cove Rock, regarded in 1858 as a fashionable watering place, "the Montpellier of the British Kaffrarian world"²⁵.

Larger farms

The vast majority of larger farms in the Border Region were surveyed and alienated between 1858 and 1861. Those on either side of both main roads from East London to King William's Town were laid out first, and these were closely followed by those

between the Gulu and Chalumna Rivers and those between the Nahoon and Gonubie Rivers. In 1859 a number of 1,500-acre farms were declared laid out, 22 between the Keiskamma and the Chalumna Rivers and 82 between the Gonubie and the Kei Rivers. The latter were never taken up on the original quitrent tenure (involving military service in an emergency) but were leased instead²⁶. In the more favoured areas, such as near the coast, farms are smaller, some actually being under 1,500 acres. In the poorer farming areas which were clearly better suited to pastoral farming and not cultivation, farms of between 2,000 and 3,000 acres were not uncommon. The surveyors were given instructions to lay out the farms so that their inhabitants could muster quickly, and have a line of retreat along a good road to the main road²⁷. Many of their boundaries, which are still farm boundaries today, ran along ridges which also carry roads. Most farms have riparian rights on rivers, which were intended to provide a normally adequate water supply for livestock²⁸. In addition a few of the 1,500-acre farms were granted in freehold as investments to the churches, to missions, to the borough of King William's Town, and to certain influential persons.

Information on the size of holdings is derived from two sources, (a) the maps and plans of the Surveyor General, Cape Town, and (b) the Agricultural Censuses. Neither give a true indication of the actual sizes of farms which are operated

as units, with the sole exception of the latest published Census of Agriculture²⁹. The censuses give an indication of the sizes of farms by magisterial districts only, without detail as to the distribution of different sizes in the area. From an examination of cadastral maps, a map of the two districts was compiled, to show the distribution of holdings in certain size categories. The basic information was derived from noting plans, which are not all up to date, and the indexes to property boundaries on the scale of 1:18,000. In the areas where some form of communal tenure survives, the sizes of holdings are the sizes of the plots occupied on individual tenure, and do not include commonage. In this sense the size of holding, as recorded on the map, does not reflect the size of the farming unit. In addition, there are many instances of one farmer occupying more than one small holding, yet working the two or more pieces of land as one unit. Sometimes several farmers of one family are known to be occupying one farm. Although portions have not been surveyed, they are working them as separate farm units. The map opposite page 116 may therefore be taken as depicting the state of subdivision of original properties in the main, and only a very rough indication of the distribution of large and small farms.

The Bantu areas are largely excluded from this study as, by virtue of the systems of land tenure in them, most plots individually occupied or used are very small (from 1 to 3 acres).

(a) Holdings of less than 100 acres

From the time of the original settlement, the size of farm was recognized as having a direct effect on the type of farming carried out. The small farms of the German villages were intended to provide subsistence for their occupants, who were also expected to provide a labour force for neighbouring farmers. In fact, Native labour was cheaper and the Germans turned to producing vegetables and dairy goods for the growing market at King William's Town. The presence of the troops there, and at posts near the villages, encouraged the production of oat-hay for the horses of the artillery, the mounted regiments and the commissariat, requirements which for 1858-9³⁰ were estimated for the area of the current survey at 2,183,000 lbs.

With the withdrawal of imperial troops and the eventual disappearance of horses as mounts, the small farms were forced back to subsistence, with the production of a little surplus for local markets. The retention of common grazing has restricted advances in animal husbandry, and curtails especially the possibility of dairying with pedigree animals unless they are kept in paddocks on the individual holdings. Holdings of less than 100 acres are too small for that.

There are many properties of less than 100 acres around East London. To some extent the administration of the day anticipated the fragmentation of holdings outside the growing town, and deliberately surveyed many small properties in the

Amalinda, Collondale and Cambridge areas. Subdivision, however, has extended further out than the areas which were originally small holdings, to Wilsonia, Beaconhurst, Abbotsford and Gonubie Mouth, and to beyond Amalinda. Many of the inner ring of small farms have been subdivided for township development. There are two quite distinct classes of small properties in the suburban fringe of East London. The smaller properties are usually purely residential, and are generally nearer the city. The larger properties are occupied by a few remaining full-time farmers and part-time farmers, who engage in the production of vegetables, fruit and a little dairy produce for the East London market. They are all within easy reach of the city, and are frequently not far from tarred roads, so that it is easy to take a truck-load of produce into town quickly. Suburban development has extended furthest from the city inland along the railway line, which now carries a considerable amount of commuter and school traffic.

Further belts of land which are characterized by holdings of less than 100 acres occur on the east bank of the Gonubie River, and between Kwelera Location and Mooiplaats. The latter includes Kommetjes Leegte Location and Tainton village. The settlers who went there were expected to grow market produce, but they complained of the long way to market³¹. Although many of their successors still grow vegetables and fruit, the fact that they are over 25 miles from East London,

places them at a disadvantage compared with the nearer farmers who have lower transport costs.

(b) Holdings of from 100 to 500 acres

Most of these are small farms rather than small-holdings, and they have no access to commonage and can do without it. Two main areas which are predominantly composed of farms of this size, are between the Gonubie River and the eastern boundary of the East London district, and a narrow coastal belt west of Cove Rock. These are areas of Scottish and German immigrant settlements dating from the 1870's, and plots there have not been much reduced in size by further subdivision. From the first, they were surveyed as agricultural sections in the strict sense. Much experiment with tropical crops took place in the two decades after settlement, but fruit growing, including lately pineapple cultivation, with subsidiary dairy farming, has been found to be the most economic activity at present. The lack of irrigation potentialities on most of these farms prevents the establishment of a more lucrative type of farming. The natural disadvantages, magnified in the case of the small farm (as the larger usually has a greater variety of land types) were seen by the surveyors of van der Kemp's location in 1882.

"The nature of the ground is very rugged, intersected by many kloofs and well supplied with bush, which in some parts is impenetrable. Most of the agricultural lands

lie along the banks of the rivers and the hills skirting the sea coast. The only drawback is the scarcity of water, of which there is no constant supply. The rivers run in such deep beds (like all Kaffrarian rivers do) that unless steam or other power be employed there is no chance of using their waters for irrigation purposes." ³²

The other area where small farms of this size occur is in an arcuate belt lying between 5 and 12 miles inland from East London. Interspersed are larger properties, the remnants of a pattern of much larger units, the so-called 1,500-acre farms. To the west and north-west, many of these small farms are devoted to fresh milk production for the East London market. An extension of farms of the same size reaches as far as Berlin, 24 miles from East London, and these are also producing fresh milk, but for King William's Town as well as East London.

(c) Farms between 500 and 1,500 acres

Most of the pineapple farms are under 1,000 acres in extent, and they lie near Kidd's Beach, south-west of East London. They have resulted largely from a simple division of single 1,500-acre farms which were devoted to the raising of beef cattle and to dairying before the pineapple boom³³. In other areas, notably in the valleys of the Quru (Qora) and Chalumna Rivers, the area between the Nahoon and Gonubie Rivers below Newlands location, and the arcuate belt of active

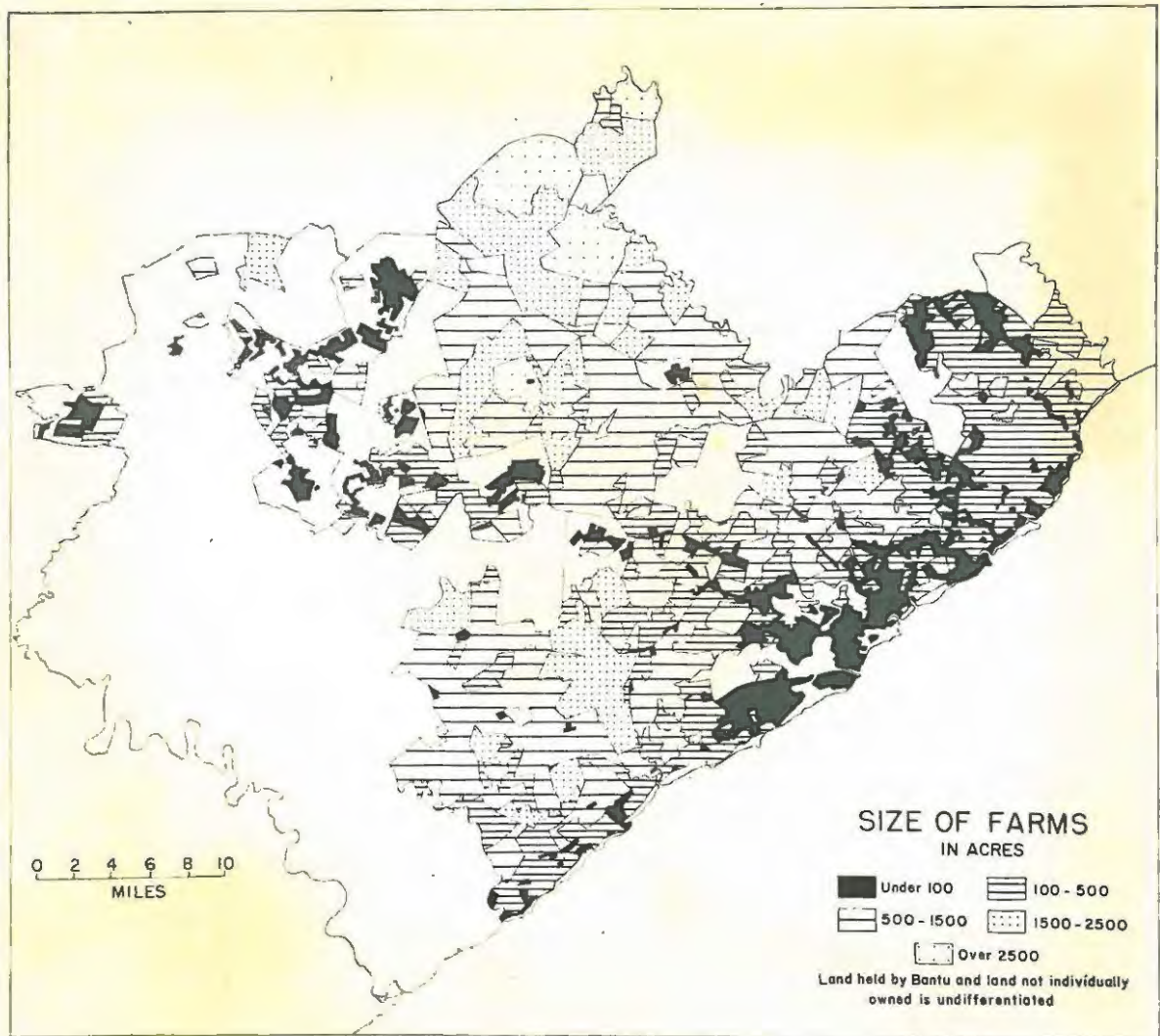
subdivision around East London, there are a great many farms between 500 and 1,000 acres, which are also the result of simple divisions of larger properties. The relatively good quality of the grazing, and their accessibility to East London, are important factors in making these areas suitable for subdivision. Mixed farming, with some agriculture, is normally associated with farms of this size outside the pineapple belt.

The greater number of farms of less than 1,000 acres, together with others of less than 1,500 acres, in the area from Berlin to east of Macleantown, are thought to be connected with the presence there of a group of Afrikaner farmers, who settled in the Macleantown district in the period between 1858 and 1862. They would have adhered much more strongly than other settlers to the Roman-Dutch laws of inheritance, under which each child is entitled to a share of his father's land. Mixed farming is characteristic of this area, which has so far remained outside the area supplying fresh milk to East London. In such a highly competitive activity, the better transport facilities of Berlin, and of other places on the railway, have probably counted for much.

(d) Farms over 1,500 acres

In the East London district farms of over 1,500 acres, which are usually undivided or original farms, are to be found mainly in the least accessible or most dissected areas. It is

MAP 9



significant that they do not usually occur in the main pineapple belt, but lie in bushy or rocky country which is difficult and expensive to clear, and which has been left largely to stock farming. Only one farm in the East London district is over 3,500 acres, and it is in one of the least accessible parts. The Gulu River valley - Fort Pato area, and the Buffalo River valley below Laing Dam, are the chief localities in the coastal district; there are also a few isolated farms of over 1,500 acres on the Gonubie River.

The north-eastern corner of the King William's Town district is a region of large farms. Most of them are undivided original farms, and range from a little under 1,500 acres to above that size. The farms between 1,500 and 2,500 acres are away from the main railway line, but do not otherwise form any definite pattern. Together with these are larger farms, most of which are over 3,000 acres in extent. Some of these farms were originally over 3,000 acres, but some have reached that total through consolidation of large sheep farms by enterprising and prosperous pastoralists.

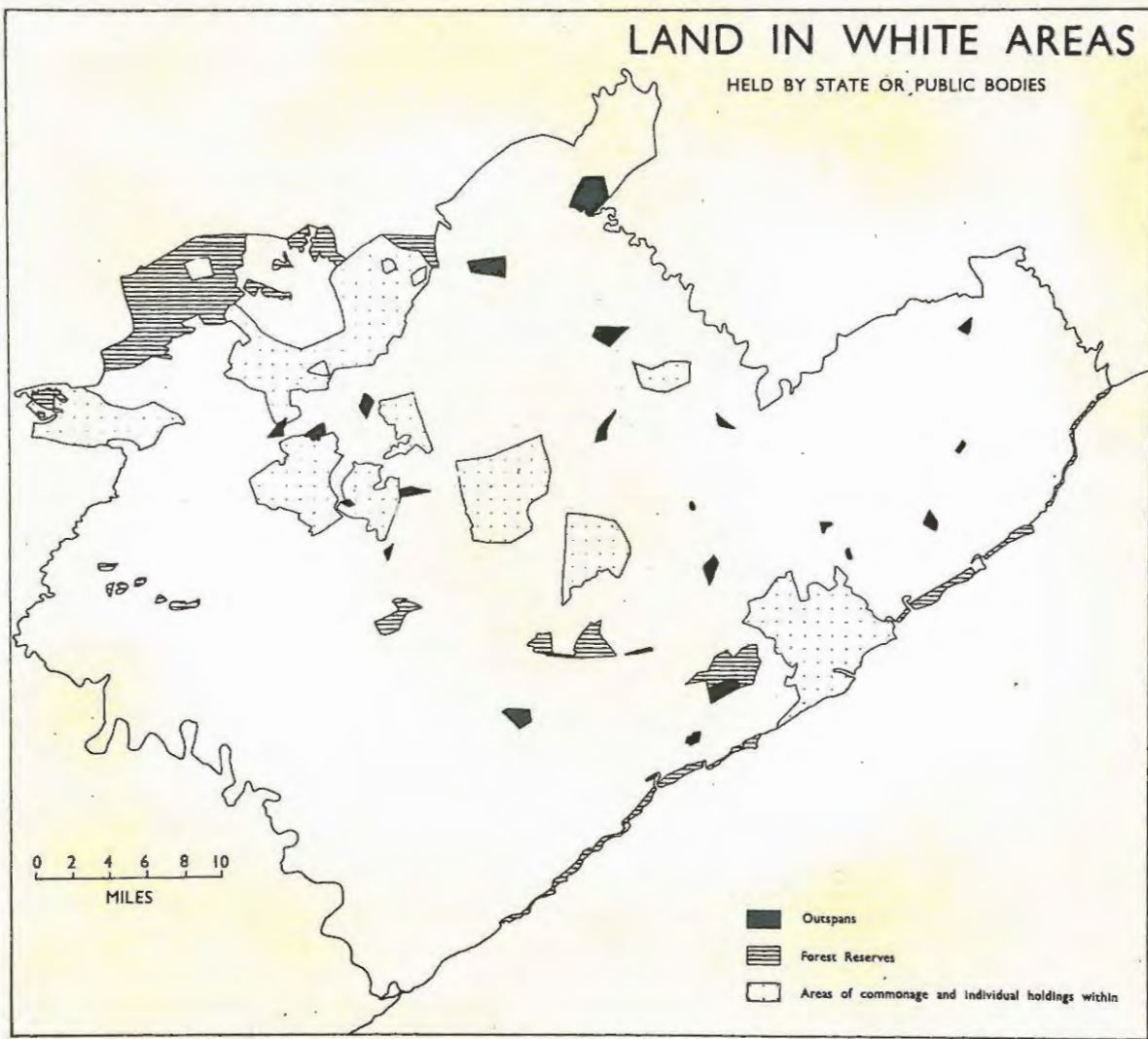
From the study of the sizes of holdings, it becomes clear that the outlines of the original White settlement pattern are gradually becoming modified by economic forces. Broadly speaking, the most intensive farming in the Border Region, on small-size farm units, is being carried on next to the towns, and the extensive pastoral farms giving a low return per acre are furthest from East London.

Forest reserves and outspans

Some 55. square miles of the two districts are set aside by proclamation as Forest Reserves. Most of the forests are along the northern watershed of the Buffalo River in the Amatole mountains. The greater part of the forest reserve in that area was unsurveyed Crown land which had been fitfully exploited for timber after the Gaikas had inhabited the area. White settlement increased the demands for timber, particularly of yellow wood, and up to 1860 the exploitation of the forests of the Amatole Range and near Fort Grey was unchecked. Much timber must have been removed, for it was in this period that the German villages and the towns were established. In 1860 the unlicensed cutting of timber in the forests was prohibited in British Kaffraria, in similar terms to those applying in the Cape Colony, and demarcated forests under the Forest Department were scheduled between 1884 and 1889. The Cwencwe forest, demarcated in 1922, was originally surveyed for private exploitation in 1865 when licences issued to sawyers expired. The dune belt along the coast has for the most part remained Crown land, and has become forest reserve.

There are 15,000 acres of outspans in the two districts³⁴, 4,000 of them in Native reserves. Outspan ground was intended to accommodate the spans of oxen drawing the waggons which were the only form of transport to the interior until the 1870's. Outspans are found frequently on the outskirts of towns, and at

MAP 10



regular intervals along the main roads. Today, with the decline in animal-drawn vehicles, they are mainly used by drovers taking cattle to and from the sales. In some cases the Divisional Councils hire out the grazing rights to individual farmers, and so those outspans cease to be available for public use. In this connection it can be noted that grazing for hire is of rare occurrence in this part of South Africa, as most farms are owner-occupied.

III. THE CONCENTRATIONS OF SETTLEMENT

There remain for description the concentrations of settlement. In addition to the city of East London and to King William's Town, there are various small townships and villages in the Border area, and a significant trend towards the development of concentrations in the Bantu reserves merits special attention.

Villages and township development in Bantu areas

Before the arrival of the White people, and for some time afterwards, the Bantu lived in temporary wattle and thatch-grass, beehive-shaped huts, nowadays replaced by still predominantly circular huts but with mud-plastered walls. They did not live in villages but in family groups of 6 to 8 huts³⁵ forming an umzi, commonly known in South Africa as a kraal. Grey, after visiting the frontier, had reported in 1856 that the huts were scattered along the ridges³⁶. There were very good

reasons for the dispersed nature of the Bantu settlements. Firstly, as livestock was kraaled in small stockaded enclosures at night, and commonly grazed quite near the umzi during the day, closer settlement would have quickly worn out the grazing. Secondly, the small, scattered patches of cultivation were near the huts in order that livestock and birds could be more easily kept off the crops. There was, even then, only a limited amount of good cultivable land and that widely distributed, and small groups of huts on ridges or on slopes overlooking the cultivated lands were customary. Thirdly, it is possible that sanitary considerations encouraged widely spaced settlements.

There have been two attempts to introduce a village system to the rural Bantu. The first, started in 1857, was for administrative reasons, to bring them "within reach of the arm of good Government".³⁷ At a time when the spirit of the Bantu had been broken by the Cattle Killing, famine and dispersal having reduced their numbers, this radical change was apparently successful. Opposition to the system from two Ngqika (Gaika) chiefs was overcome by 1858. Sketch maps, as well as returns of the different locations in 1859, show that villages composed of a number of imizi (kraals) had been established. There were often between 5 and 9 imizi, but one village had as many as 24. The regulations for controlling these villages established a maximum number of 200 huts³⁸, presumably to

ensure the provision of adequate grazing and water. It should be emphasised that these rural villages were little more than closer groupings of imizi, despite the introduction of individual land tenure in some cases. The villages then formed near King William's Town and near East London were the fore-runners of the urban locations³⁹, although they were much smaller than they are today, and, judging from contemporary photographs, they preserved a superficial rural character into the 20th century.

In some locationsⁱⁿ the Crown Reserve, villages were surveyed and residential sites marked out. These are best seen today at Pirie and Balasi Locations, but at Masingata's and Joseph William's Locations the rigid grid pattern selected for the village plan has become obscured long ago. The system of individual tenure, with which these villages were associated, was never really successful with the Bantu, as it was so radically different from their traditional system of land use. This attempt to establish rural villages in the Reserves was, therefore, an abortive one, and although rural villages are recorded in 1879,⁴⁰ they appear to have lapsed after the turn of the century. In the King William's Town district there were a thousand squatters on the commonages of surveyed locations by 1916, that is, in kraals away from the surveyed villages⁴¹. Although there has been a general reversion to the dispersal of imizi, strung out along the ridges or on slopes near the

the lands, the present settlement pattern in the surveyed locations is composite, retaining more or less clearly some of the features of the former villages.

The traditional, dispersed character of rural settlement in the Reserves during this century is shown by aerial photographs taken in 1938, except where the Native Affairs Department has in recent years reintroduced villages in association with Betterment Schemes. This dispersed character of settlement is very wasteful of land, especially grazing land, for the movement of livestock from cattle and goat kraals in search of grazing, and back again each evening, results in a criss-cross pattern of well-worn tracks. In a country where it is rarely necessary to house livestock overnight because of cold, or where predatory animals are now seldom met with, nightly enclosures of livestock is not merely traditional but also unnecessary. Deterioration of the land, as well as increase of population, have led to a second attempt to develop villages in the Reserves, under the Betterment Proclamation (No.116 of 1949).

In those locations where the provisions of the Betterment Scheme have been carried out, the settlement is arranged in villages composed of contiguous residential sites, usually in some geometrical pattern adapted to the locality. All isolated imizi are required to be removed. The extent to which this had been effected in the survey area by March 1958 can be seen on the map The Border Region Native Areas of this

volume. As more and more locations are planned, the traditional dispersed settlement pattern will eventually die out in the survey area⁴².

A more radical development is the large urban Bantu settlement established at Zwelitsha south of King William's Town. The first of its kind in South Africa, construction commenced in 1946. Based on a layout of streets of modern design and fenced plots for individual family occupation and ownership, European-styled houses have been constructed, though most of them are of a simple character. The inhabitants are expected to work in local industries, either at the neighbouring textile factory or in King William's Town. The township is provided with services, and has churches and other communal buildings, to which have been added a number of Bantu commercial enterprises. In many ways it resembles superficially the more modern municipally-built urban locations at East London, but it was planned to operate it as an entity under a local Bantu management council within the framework of the Bantu Authority System. In 1956 the estimated population was 5,200. Zwelitsha is more fully dealt with in Economic Development in a Plural Society, pp.293-297. The Tomlinson Commission calculated that some 49 per cent of the Bantu population in the Reserves was surplus to the requirements of a planned agricultural economy. Many rural Bantu could be absorbed into townships planned like Zwelitsha, or into settlements such as that at

Cwebeni in Released Area 33, or the planned settlement at Mngqesha.

Villages and minor townships in White areas

Apart from the Bantu Reserves, South Africa is a land of towns and farms, there being no villages in the European sense of the term. Nineteenth century Governors of the Cape Colony, such as Cathcart and Grey, deplored the fact that there were no villages and few towns and, at that time, no working class population. They were appalled at the waste of country which large farms implied. Many people, including these Governors and the High Commissioner of British Kaffraria, Colonel Maclean, considered that the Border Region, being better country than that to the west, was more suitable for close settlement. Being brought up in Britain, a **land** of villages, they attempted to found villages in the frontier districts. As Maclean wrote in the early 1850's, "The portion of the country most eminently fitted for concentrations (of settlement) is that bordering on the present frontier, where a large proportion of the land is suitable for agricultural purposes."⁴³ Unfortunately for the schemes, this appreciation of the capabilities of the country was made in relation to the dryness and poverty of the soil of the Colony proper, where it was acknowledged that the population had to be sparse. The true capabilities of the Border Region were

realised much later. In the Cape Colony proper, the prevailing system of settlement had been by means of farms of some 6,000 to 12,000 acres, with administrative or service towns at very widely spaced intervals. Nearer the frontier, towns such as Grahamstown grew up around military establishments, and later became administrative and commercial centres. It was possibly the rapid change in the appearance of the country between the Great Fish and the Buffalo Rivers which suggested to the officials that the frontier was capable of denser settlement.

An examination of the establishment and development of the villages in the Border Region reveals that this optimism was not justified. The present pattern of White settlement here is not very different from the usual picture in rural areas in South Africa, where the locally important town stands in marked contrast to the relatively empty countryside dotted with isolated farmsteads. In a few places, sometimes based on the established villages of the nineteenth century, a centre with hotel, post-office, garage and general store serves the surrounding district of farms, and possibly Bantu areas nearby. As far as possible, farmers live on their own farmland, and they do not congregate in nucleated villages like those of the European plain. It is interesting to note that even the German peasant immigrants, who probably had a background of gregarious settlement, abandoned it in South Africa.

Most of these nucleations of settlement are of fairly early

origin, founded in places thought suitable at the time. The first were associated with military posts such as Izeli and Fort Jackson. The second and largest were the products of German settlement. Potsdam, Berlin with Charlottenburg, Breidbach, Braunschweig, Frankfort with Wiesbaden and Marienthal, and Mngqesha all date from the late 1850's. Of these, only Berlin and Frankfort have today more than a few houses, a Lutheran Church and a general store. Although building plots were provided in all these villages only a few were developed. The villagers preferred to live on their additional agricultural allotments rather than in the villages. This was more convenient for farming as there was hardly room for the farmstead with its byre and barns and its garden on building plots of less than an acre.

Berlin enjoys the double advantage of being on the main railway from the coast before branch lines leave it for King William's Town and the Transkei respectively, and on the inland and westward National Road before it divides. It therefore possesses a type of artificial nodality. This has yet to be exploited by industry, but, with the publication of the reports⁴⁴ of the Natural Resources Development Council, interest is again focussed on Berlin, which has an unusual amount of neighbouring flat land.

Frankfort has developed slightly at the expense of Wiesbaden and Marienthal, which even lack churches. Mngqesha,

left aside by the railway, has lost some of its service functions to the neighbouring Debe Nek, a settlement at a railway station. Potsdam seems overshadowed by the nearness of East London. Breidbach appears to have developed as a multi-racial suburb of King William's Town; there were complaints as early as 1916 that it had been practically ruined by Natives buying plots there⁴⁵. Today it has a high proportion of coloured people, who tend to live closer together on the building plots, while the remaining Whites live on their holdings outside the village proper.

There are two other settlements founded in the nineteenth century, both of which testify to the failure to transplant the European institution of the village in South African conditions. Macleantown, founded in 1861, had a certain ephemeral success. The large farm, out of which the village and its commonage was cut, had been granted to the Dutch Reformed Church. As it is situated at the intersection of what was at that time the main road parallel to the coast, the Lower Kei Road, and the direct road from East London to Queenstown, the promoters of Macleantown were confident of its success. Two squares as well as sites for market and government offices were provided. The King William's Town Gazette expected it to become second only to King William's Town. In these early days many neighbouring Afrikaner farmers intended to have town residences at Macleantown, and a local newspaper was also published.

A dozen years later the railway was being constructed, and when the original enthusiasm abated, and the neighbouring villages on the railway grew, Macleantown lost its raison d'être, and declined to the same importance as the lesser German villages. As most of the surrounding farms were larger than around the German villages, the population of the district was smaller, and provided less livelihood for purveyors of services in Macleantown. The village came to have a large proportion of Bantu persons in its population, and experienced grave social and economic problems. These have been fully investigated by Rhodes University⁴⁶ for the East London Divisional Council, which recently took over the administration from the local Village Management Board.

The other white village settlement which failed to become established is Tainton, south of Mooiplaats. It was divided into 200 building lots for immigrants in 1880.⁴⁷ It is noteworthy that the immigrants who were located there, complained then of the long way to market: East London *being* 24 miles *away*. In 1916 it was reported that Bantu were buying lots in Tainton village.⁴⁸ A local assessor recommended that the whole area should be reserved for Native occupation as it was then "largely occupied by Natives, it adjoins the Mooiplaats scheduled area. The Europeans who occupy the small sections under consideration are very hard put to it to make a very existence from their lands. They live from hand to mouth,

and though perhaps otherwise very worthy folk they are sadly lacking in much that proves the superiority of white over black. The man who is responsible for closer settlement such as this, so very far from the markets, and upon such poor soil with steep and sour pasturage of so limited extent, failed to give the matter wise consideration. Only a Kaffir, with his limited requirements, could be expected to exist upon such terms." ⁴⁹ Tainton village was declared a Released Area in 1936, and now has few, if any, white inhabitants. It is a village of rondawels without even a store or church. The service facilities of the area are provided at Mooiplaats, which has a hotel, a general store, a post office and places of worship.

The only settlements in the Border Region with any claim to village status today are Berlin and Kei Road with total populations at the time of the survey of about 1,600 and 500 respectively. Kei Road (founded as Gleesonia Township) was expected to develop as a result of trade between the railhead and the Transkei, along the Great Kei Road, but the extension of the railway to Butterworth and Umtata restricted its functions to their present ones. Berlin and Kei Road each fulfil service functions for a fairly extensive farming area. Both are on the main railway to the north. Each has a village management board, a post office and a telephone exchange, a clinic, churches, several stores, a ~~po~~lice post, a school and hotels.

Berlin on the National Road has two garages as well as tearooms, but Kei Road has only petrol pumps. Kei Road, as the centre of a large stock-rearing area, has sale pens where auctions are held regularly throughout the season, and the sports grounds there, together with the nearby hotel, serve as a community centre for the neighbourhood. Berlin has many more dwelling houses, some of them occupied by small-holders, others by people who commute to work in East London or King William's Town.

The City and port of East London

East London began as a port in 1847, with a settlement on the west bank of the Buffalo River near its mouth, and it was strengthened by an adjacent military post, Fort Glamorgan. Until the 1880's, the name East London referred to this west bank township. It is not easy to say why the first settlement should have been on that side of the river, except that the deep channel in the estuary of the Buffalo River near its mouth was next to the west bank. The military road, connecting forts between the coast and King William's Town, was constructed from this site along the Goolah Ridge on the west bank side of the river, and it passed through the country of friendly chief Pato, the main body of the Xhosa tribes being east of the Buffalo River. It is of great interest to record the appreciation of the original site of East London by the then Surveyor General, who wrote in 1857, before the German Legion

had been settled, and when civilian settlement of British Kaffraria was being considered. His views appear to have played a great part in the transfer of the centre of gravity of the town from the west bank to its present situation, and his memorandum is therefore quoted in full⁵⁰.

"The advantages belonging to the Eastern side of the Buffalo as compared with the Western for the formation of a village are

(1) The ground is higher - possessing greater capabilities for building and as a residence more healthy and desirable.

(2) The water is far superior (although only what is termed "Vlei Water") but the supply could be much increased by sinking wells.

(3) Wood is more abundant and more locally of fair size.

(4) The distance from King William's Town is decreased Six Miles - the road the whole way free from bush and a sufficient supply of water.

(5) The site (Fishbourne Point) is free from sand and from the nature of the soil no "drift" need be dreaded.

(6) Landing can now at all times be effective and on the completion of the works on this side under the Chief Engineer a large area for such purposes, I am informed, will be available.

The advantages possessed by the western side (East London) I look upon as transitory resulting from the fortuitous

circumstances of a village having been formed under the protection of a Military Post and of having been accepted as the terminal point of the only protected (and therefore available) line of traffic from the Market Town (King William's Town) to the sea.

Transfer the Forts Glamorgan, Grey, Pato and Murray to the other side of the river and East London falls into the category of 'things that were' to be revived perhaps, some centuries hence for the amusement of a few in the journal of 'the last days of East London'.

If the village were established on the Eastern side it could - without difficulty be made defensible - but, of course, until so and until sufficient and permanent Military protection has been placed along the line from King William's Town to the sea it would be useless to settle any portion of the legion there, they could however, be temporarily treated on the Western side until proper arrangements for their permanent settlement have been completed on the Eastern side. There is little fear of their not meeting with ready employment to their benefit in the interim."

Then follow recommendations on the settlement of ground near existing military posts concluding with

"Should, however, the Eastern Road be accepted all present worth due to any one of the Posts in the existing Buffalo line falls away.

February 14th, 1857.

J. Montagu
Deputy Surveyor General".

These views led to the settlement of the German legion along the east bank, and the new eastern road was opened in February 1858,⁵¹ and it was connected by a pontoon to East London on the west bank.

East London grew slowly at first. The whole of the Cape Colony suffered from the trade depression of the 1860's, and East London suffered particularly owing to the need for the improvement of its harbour. In 1862 the King William's Town Gazette reported the comments of a traveller on the state of the town at Buffalo Mouth⁵². It was said that East London had only a few slightly built houses, and that at Panmure on the east bank scarcely one hut in five seemed to be occupied and most were in a state of decay.

Trade having revived through the development of the Diamond Fields, the town started to grow again. The improvement of the harbour, and the construction of the railway, begun in 1872 and starting on the east bank side, confirmed the pre-eminence of the east over the west bank. Less than a year later the three "villages" of ~~the~~ East London West, East London East and Panmure were united under a municipal board. In 1875, however, buildings in East London were not going up as rapidly as might have been expected; building lots were not being built on because people were waiting to judge the success or otherwise of the harbour works, and were not sure on which side of the river to build as there was no bridge⁵³. By 1878

the railway linked East London to King William's Town and Kubusie (Stutterheim), as well as to the landing jetty where loading and customs examination took place. In the same year many members of the commercial community moved from the West Bank to Panmure⁵⁴; and the East Bank was soon unchallenged as the commercial centre, while the West Bank, without a bridge until the first decade of the 20th century, ceased to expand. East London remained primarily an import and export port, and a commercial centre, until after the First World War. Only one industry, in the form of an aerated water firm, was recorded there in 1903⁵⁵.

Although East London has become significantly industrialized during the current century, it has had only a small share of the growth of manufacturing industries which the Union has experienced since World War I. Judging from the occupational census of 1951, East London is predominantly a service town, with a metropolitan function with respect to the Border Region in the wider sense. Only 21.3 per cent of all occupied workers in East London were engaged in secondary industry, whereas nearly 70 per cent were in service industries, more than 16 per cent being engaged in commerce⁵⁶. In 1953-4 there were 284 industrial establishments employing 11,299 persons of all races, and with a gross output of £16.6 million. Two-thirds of these industrial workers, and nearly £13 million of the gross output, concern the five major categories of food,

textiles, chemicals, transport and construction. At the time of the survey two new factories for canning fruit had been established, connected particularly with the production of pineapples, but apart from the stimulus given to canning industries by local fruit production, no special advantage of location is possessed by East London except proximity to the large potential Bantu market in the Transkei and Ciskei. For a full account of East London commerce and industry Economic Development in a Plural Society should be consulted.

The prevailing impression given to the visitor by East London is not that of an industrialized city. Perhaps this is because of the peculiar way in which the harbour and the industrial areas are segregated from the commercial core of the town, which remains fairly clean as a result. Most of the residential areas on the east bank are similarly remote from the industrial areas⁵⁷.

East London, with a total population of over 100,000, combines three functions - national, regional and local. As a national centre, it ranks fourth amongst the ports of the Union, though well below the others with about 10 per cent of the value of imports and also 10 per cent of the value of exports, excluding golds, diamonds, and atomic energy materials. In industrial output it falls well below the four major industrial districts of the country. Both as a port and as a source of manufactured goods its function is not limited to the

Border Region even in the widest sense of that term. It draws holiday makers from all over Southern Africa. Its port and commercial organization serve a hinterland of 42 magisterial districts in the Eastern Cape Province⁵⁸, extending to the Orange River and to beyond Umtata in the Transkei. Within this region it has a metropolitan function, acting also as its cultural and social centre. The circulation area of the Daily Dispatch is but one expression of the influence of the city within this region. In addition East London is the local shopping and administrative centre for its own magisterial district, and to a certain extent for parts of neighbouring districts such as Peddie, Komgha and King William's Town.

King William's Town

The only other true town in the two districts of the Border Region is King William's Town. Formerly more important and larger than East London, its fortunes have declined as the latter's have risen. Although it is now much smaller than the city at the mouth of the Buffalo River, it still has more than a purely local function. The regional functions remaining reflect King William's Town's former importance. It was a provincial capital during the formative years of the frontier settlements of British Kaffraria. In that period it had a Supreme Court, a Surveyor General, and a Deeds Registry, and was the seat of administration generally. Of these, only the

Deeds Registry remains. The presence in King William's Town of a Chief Native Commissioner's office has, however, resulted in the continuance of its importance as a regional centre for Bantu Administration, including that of the Ciskeian Reserves, not only those for the Border Regional as defined for the purpose of the survey, but the Reserves of 10 other magisterial districts. The reduction of the commercial function of the town has been examined in a companion volume⁵⁹. The main commercial houses in East London maintain only branches in King William's Town. As an industrial centre the town had from early times some small factories processing primary produce. A few of these, such as a soap factory, a tannery, food and drink factories, and mills of various kinds, have little more than local importance today. As industrial development in the Union depends very largely on railway facilities, the original siting of King William's Town in the upper Buffalo River valley has proved disadvantageous, although it was well placed for water supplies. The main railway from the port to the interior by-passed the town, which, had it been originally sited on the interfluvial ridge to the east, might well have grown to greater importance.

REFERENCES TO CHAPTER 7

1. Cape of Good Hope Archives, BK421. Memorandum by Sir George Cathcart, dated at King William's Town, 27 February 1853.
2. du Toit, A.E.: The Cape Frontier. Archives Year Book for South African History, 1954. I. has been drawn on extensively for this account.
3. Government Notice No.16 (British Kaffraria), dated at Fort Murray, 28 July 1858, and Government Notice No.302 (Cape Colony), 12 July 1858, give full details.
4. There is some reference to the reservation of pasture for drought by tacit agreement. Commission on Native Laws and Customs, 1883, G4-'83, p.224.
5. South African Native Affairs Commission, 1903-5. Appendix C (Minutes of Evidence taken in the Cape Colony), questions 6593, 6598.
6. S.A. Native Affairs Commission 1903-5. App.C., 7869-7871.
7. Ibid. App.C., 6671.
8. Ibid. App.C., 5600-5604.
9. See the aerial photograph opposite p. 301
10. Sir George Grey's instructions. Govt. Notice No.16 (Brit.Kaff.), 1858.
11. See Chapter 10.
12. Sir George Grey's instructions. Govt. Notice No.16 (Brit.Kaff.), 1858.
13. Note on the diagram showing the extent of alienated land in British Kaffraria. The curves are plotted on a logarithmic scale and thus show the rate at which land was alienated. The combined area of the two districts was formerly equal to that of British Kaffraria, but each has been progressively diminished by boundary changes. The details of the latter are set out in Appendix 1. The districts retained their relative positions and common boundary line throughout the period under review.

References to Chapter 7 (continued)

14. Parliamentary Papers, 1857-8 XL(389), as recorded by E.L.G.Schnell in For Men Must Work.
15. Return from Surveyor General to High Commissioner, British Kaffraria, giving distribution of German families expected in 1858. Cape Archives SGBK.
16. Sir George Grey's instructions. Govt.Notice No.16 (Brit. Kaff.), 1858.
17. Surveyors' report, in Report of a Select Committee of the Legislative Assembly of the Cape of Good Hope on Immigration, A5 - '76.
18. Blue Book on Native Affairs (Cape Colony), 1873, G.27 - '74.
19. Blue Book on Native Affairs (Cape), 1876, G.16 - '76.
20. Schnell, E.L.G.: For Men Must Work, p.222.
21. Hobart Houghton, D.: Economic Development in a Plural Society, Ch.3.
22. Annual Report of the Surveyor General (Cape), 1880, G.53 - '81.
23. Memorandum from Bryant (Surveyor General, Brit.Kaff.) to Maclean, dated 27 January 1861.
24. Govt.Notice No.3. (Brit.Kaff.), 1858, published King William's Town Gazette, 6 February 1858.
25. King William's Town Gazette, 23 October 1858.
26. See reference 17.
27. Sir George Grey's instructions, Govt. Notice, No.16 (Brit.Kaff.), 1858.
28. See maps accompanying this volume. Note that the farm numbered 59 south of Chalumna should read 79, and that farm 139 south-east of Kei Road should read 189.
29. Report on Agricultural and Pastoral Production, 1954/55. UG49 - 1958, *and subsequent ones.*
30. Call for tenders published in King William's Town Gazette, 19 December 1857.

References to Chapter 7 (continued)

31. Annual Report of Surveyor General (Cape), 1880, G.53-'81.
32. Annual Report of the Surveyor General (Cape), 1882, G.65-'83, p.24.
33. For a fuller discussion of the Pineapple Boom, see Hobart Houghton, D.: Economic Development in a Plural Society, Chapter 3; also Chapter 12 in this volume.
34. Information supplied by the Secretaries, Divisional Councils of East London and King William's Town, in 1957.
35. Revd. W.Impey to Sir Harry Smith, 22 October 1850, quoted by du Toit, A.E.: The Cape Frontier, p.105.
36. Sir George Grey to Labouchere, 18 October 1856, P.P.1857-8, XL 2352.
37. Impey to Maclean, 18 April 1857, quoted by A.E.du Toit, ibid. p.106.
38. du Toit, A.E., ibid, p.106.
39. For a contemporary account see Reader, D.H.: The Black Man's Portion.
40. Annual Report of the Surveyor General (Cape), 1879, p.27. G.33-'80.
41. Natives Land Commission 1916, Vol.II, p.143, UG 22-1916.
42. Further details will be found in Appendix 1.
43. Memorandum on the Introduction of Convicts to the frontier. Addressed to the Deputy Assistant Commissioner, Grahamstown. No date but before 1855, Cape Archives GH 8/43.
44. Onderzoek na die Vestiging van Nywerhede na-aan die grense van die Bantoe-gebiede in die Unie. I. die Oiskegebiede. Pretoria 1957.
45. Natives Land Commission, 1916, Vol.II, Appendix X on p.11 UG 22-1916.
46. Irving, J.: Macleantown Survey. Institute of Social and Economic Research, Rhodes University, 1959.

References to Chapter 7 (continued)

47. Annual Report of the Surveyor General (Cape), 1880, p.8, G.53-'81.
48. Natives Land Commission, 1916, Vol.II, p.159. UG 22-1916.
49. Report of Natives Land Commission, 1916. Appendix VIII, p.11. UG 19-1916.
50. Memorandum to High Commissioner, British Kaffraria. Cape Archives.
51. Government Notice No.1 (Brit.Kaff.), 1858, published in King William's Town Gazette, 23 January 1858.
52. Report of 'Social Reformer', October 1862, fide this account.
53. Report of the Civil Commissioners, in the Annual Blue Book of the Cape Colony, 1875.
54. Ibid. 1878.
55. Burton, A.R.E.: Cape Colony for the Settler, P.S.King, 1903.
56. Drawn from Hobart Houghton, D.: Economic Development in a Plural Society, Chapter 7, Table 156.
57. The urban regions and present land use of the main towns are dealt with in Chapter 12.
58. See Hobart Houghton, D.: Economic Development in a Plural Society, Appendices A and C, and map on p.29.
59. Alty, S.W. in Hobart Houghton, D.: Economic Development in Plural Society, Chapter 2.

Chapter 8

DISTRIBUTION OF POPULATION

It was noticed as early as 1905 that "the density of population map is the most direct expression of the economic utilization of the natural region".¹ This truism is not confined to the natural region, it being equally applicable to administrative regions and thus to the survey area. In this chapter an analysis of the areal variations of population is given, in two of its aspects, race and sex, from the data for 142 census sub-districts, based on manuscript material provided by the Director, Bureau of Census and Statistics. The analysis is not confined to population density, but also includes a study of other aspects of the distribution of population in the Border Region.²

In the Border Region, as elsewhere in South Africa, the relations between the different races and the areas they live in is so very different, that it is meaningless to consider the density of population of all races together. It is only in a very ^{few} limited areas that men of different races follow similar occupations, and consequently give any meaning to a combined density figure; Frankfort, with its German and Bantu freehold farmers would come into this category. Since the activities of the individual racial groups are so dissimilar, it is more profitable to examine separately the

spatial variations in the density of each of the two significant racial groups. The relatively small Asiatic and Malay populations, and also to a large extent the Coloured people, are confined to the urban areas, and as they form only about 5 per cent of the total population of the region, they are not dealt with in this chapter.

The greater part of the survey area is rural in character, and throughout it both the White and Bantu groups are to be found in varying densities. The dominant occupation of both groups in the rural areas is farming, but forestry and trading are of some importance. Near the towns the rural population includes a significant number of persons who travel daily into the towns to work, a fact which must qualify the impression of rural densities shown in some parts of the maps.

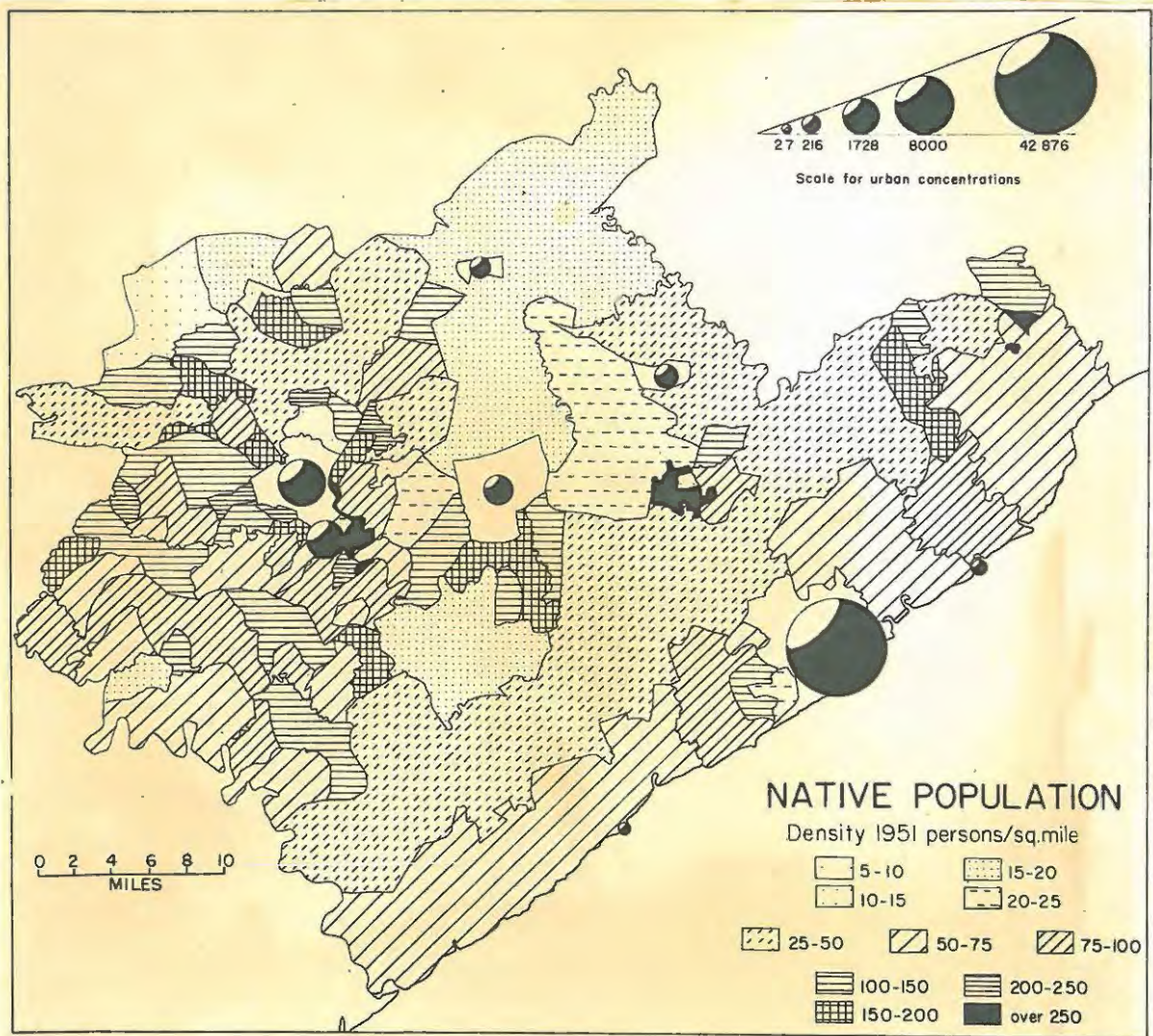
All population densities are expressed in terms of the number of people in the area of the census sub-district. There is little point, however, in calculating the densities of population for areas such as the municipal area of East London, which are partly town and partly open space, or such as Berlin, which has at its centre a small township, but which is otherwise a scattering of farms and extensive open commonage. Certain more truly rural areas have had densities assigned to them, although they too are sometimes urban areas for census purposes. The two maps showing White and Native population density respectively thus show values for predominantly rural

areas only, and the areas enclosing the five leading urban concentrations are disregarded in both maps, their urban total populations being indicated by an additional symbol.

I. DENSITY OF BANTU POPULATION (Map 11)

The recorded densities of Bantu population, in the rural census sub-districts in 1951, vary widely between a maximum of 701 per square mile to 5 per square mile. For the Keiskamma Thornveld area (typical of the western part of the King William's Town district), the Tomlinson Commission³ considered that a Bantu farming population of 28.4 persons per square mile a reasonable figure for satisfactory husbandry. Most of the Bantu area in the region has a density of more than this figure, and in 1951 many of the individual locations or sub-districts could be considered congested, especially when it is realised that only the de facto population was enumerated there. Several areas at considerable distances from urban employment are included in this category, such as the southern part of Mooiplaats Location (701 persons per square mile), Anders Mission Location (202), Macibi Location (180). Densities are also high in the rural locations near King William's Town, which supply labour for the town's services and industries, Rhayi Location (211) and Kwalini Location (216) being typical examples. Half of the total rural area in the two districts had a density of over 46 per square mile, and a quarter of the same area had a density of over 76.7 persons

MAP 11



per square mile. All the unsurveyed scheduled locations had a density of over 46 per square mile. Those areas with less were White farming districts, with the exception of a few limited tracts which have special types of land tenure, including part of Mngqesha, Farm 319 and Released Area 26, all of which were in the Crown Reserve.

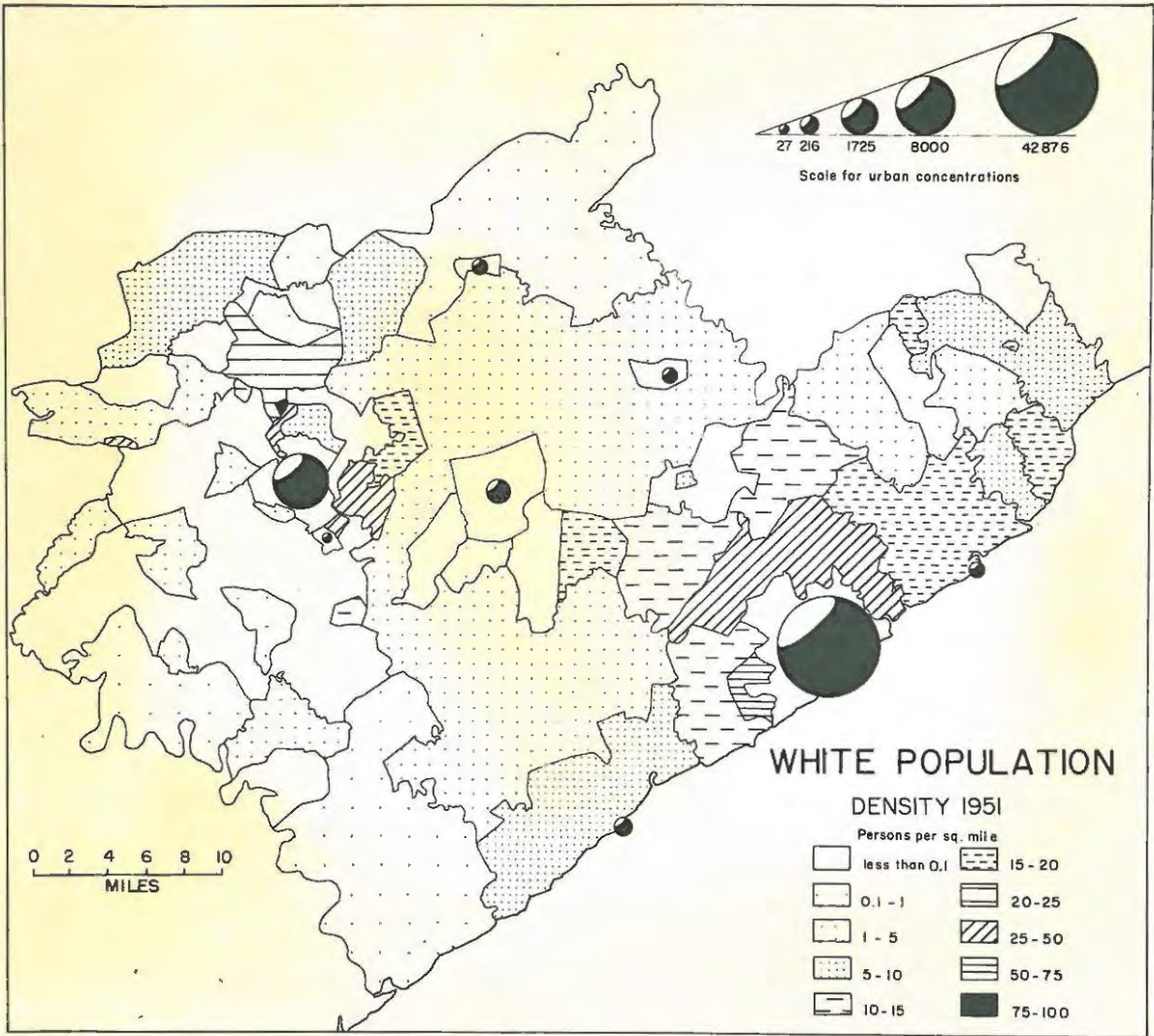
In the areas occupied by White farmers, the density of Bantu population falls off with increasing distance from the coast. In the coastal areas a more intensive type of agriculture, on generally smaller farms, requires more labour per unit area than the extensive pastoral farming of the Kei Road area. In the White farming areas there are typically 50-60 Bantu per square mile near the coast, and 15-20 per square mile in the north-east of the survey area. Most of the main milk-producing area, between these two tracts, has a density of between 20 and 40 Bantu per square mile.

It may well be that the relatively high densities, in the locations south of Berlin, are explained partly by the availability of farm work in the numerous dairy farms at Berlin, as well as by the relative nearness of King William's Town and of the textile factory at Zwelitsha.

II. DENSITY OF WHITE POPULATION (Map 12)

The Border Region is no exception to the general rule in South Africa that the greater part of the White population lives

MAP 12

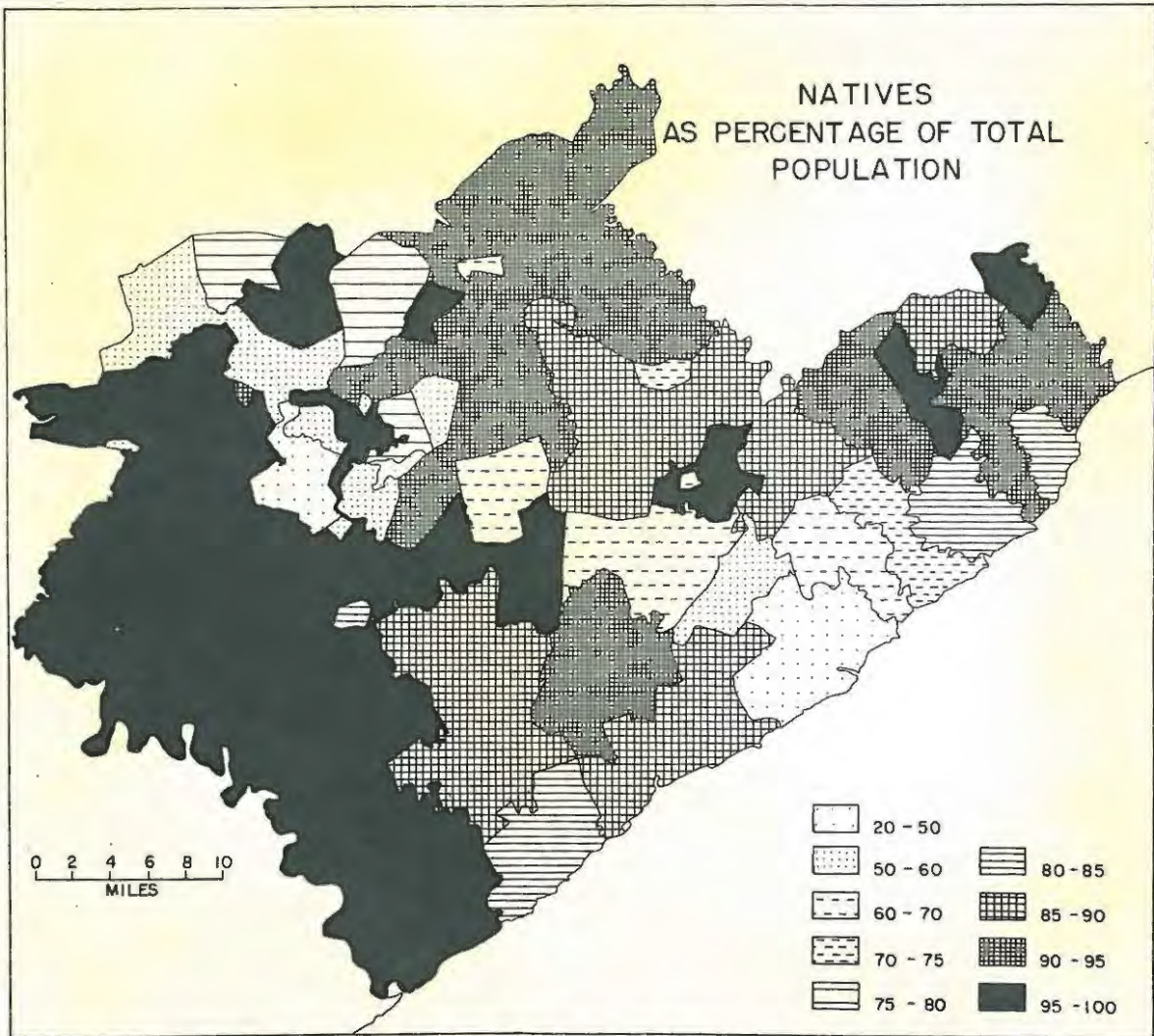


in the towns. There are, however, some rural areas where the White population has locally a much greater density than is true for most of the country. Since, in general, one White farm is occupied by only one or two White families, the size of farm is a major factor in controlling the density of rural White population. The German settlements, and the suburban fringes of East London, are the rural areas most thickly peopled by Whites, but the area of smaller farms in the coastal belt, especially the part of it east of East London, has comparable densities (between 5 and 20 per square mile). Many of the White areas of more extensive farming, as between Berlin, Macleantown and Amabele, have densities of White population no higher than in some of the Bantu areas where there are only White traders or officials, often having less than 1 White person per square mile. As might be expected, many of the Bantu locations have no White residents.

III. THE PROPORTION OF BANTU IN THE TOTAL POPULATION (Map 13)

This is a measure of the dominance of the most numerous racial group in the Bader Region, as it is in the Union as a whole, and it is of great significance. It confirms many of the distinctions between the different farming regions, and also reveals something of the settlement history of the area. The highest percentages of Bantu are to be found in the Bantu areas, where the proportions are nearly everywhere above 95 per cent. Only the locations with large mission stations

MAP 13



have lower percentages of Bantu (Peelton 93 per cent, and Mount Coke 83 per cent).

Many of the White farming areas that have few White people, have equally high percentages of Bantu (generally above 90 per cent), but there are important areas east and north-east of East London where the proportion of Bantu is high in spite of there being higher densities of Whites. In the East London district across the Gonubie River, there have long been Bantu-owned freehold properties, and a considerable Bantu population. This was so noticeable, even as far back as in 1876, that the Blue Book of Native Affairs described the eastern part of the East London Division as "like Kaffirland" in appearance⁴. In 1916 the Beaumont Commission had found that this area was "largely occupied by Natives", and it was recommended for Bantu occupation by the assessor⁵.

In no area is the Bantu population less than 20 per cent. The main areas which have small proportions of Bantu lie astride the East London-King William's Town axis, and in the mountain forests. All towns and townships, with the exception of Zwelitsha, have proportionately fewer Bantu than the rural areas, but this is chiefly because there are more Whites in them.

IV. MASCULINITY OF THE BANTU POPULATION (Map 14)

The masculinity of a population is defined as the number of males per 100 females. The ratio between the sexes in the

Bantu population varies considerably in the survey area, and is connected with many aspects of the local and national economy. The chief interest in a study of masculinity concerns labour problems, but masculinity can also be related to the pressure of people on the available land.

Of the 142 census sub-districts in the survey area, half had a masculinity of between 71.7 and 88.1. Half of the sub-districts had more than four males for every five females (or a masculinity of 80) and half had less.

It is of interest to compare the masculinity of the two Border districts with that of other parts of the country.

Table 27

MASCULINITY OF BANTU POPULATION 1951

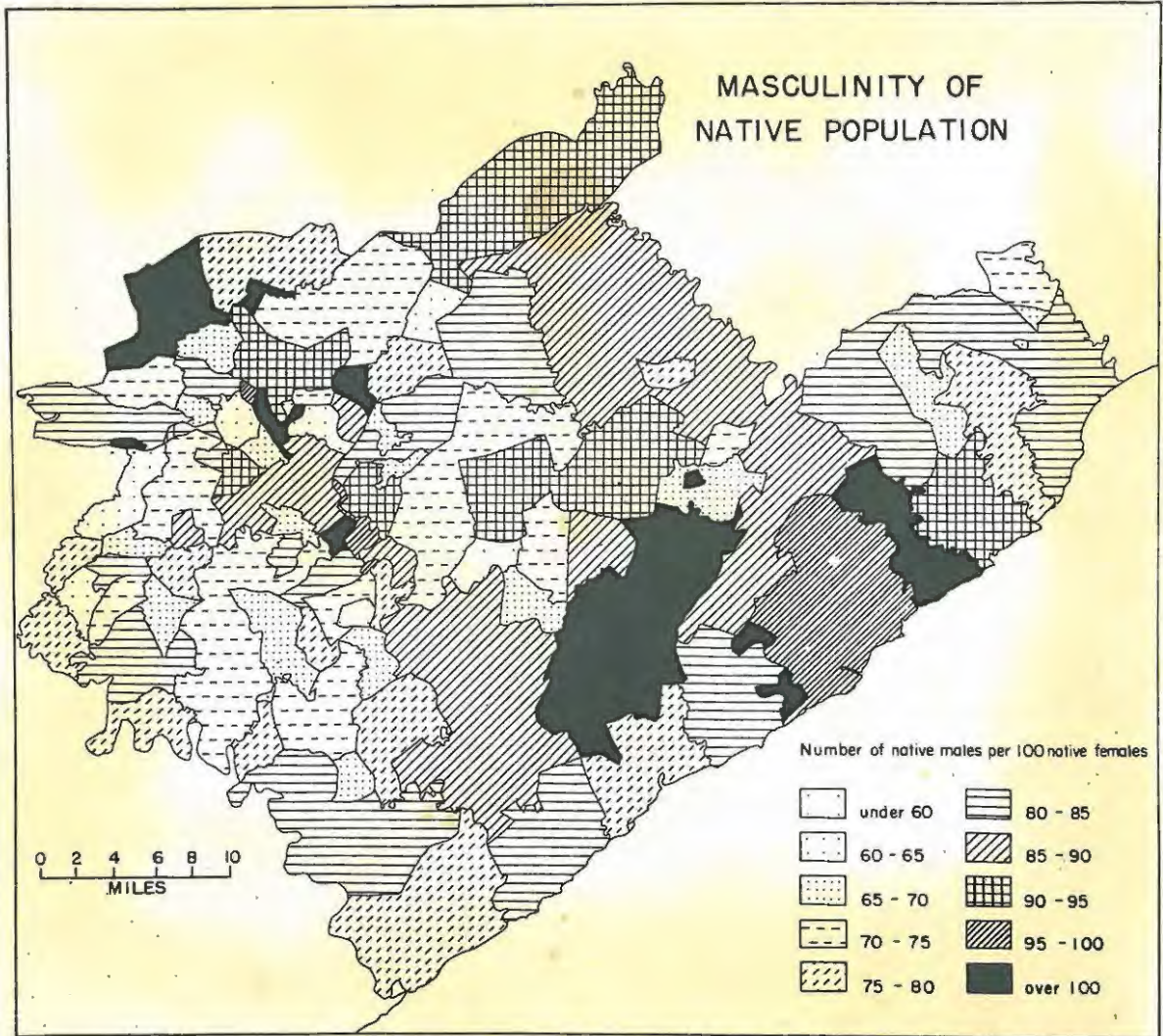
	Urban*	Rural*	Strictly urban	Predominantly rural
Union of South Africa	157.5	89.6	-	-
Cape Province	109.8	80.8	-	-
East London district	95.5	82.4	95.7	77.3
King William's Town district	99.0	76.4	107.0	76.8
Witwatersrand	213.4	-	-	-

* Census classification

Sources: Census 1951, Vol.I, UG 42/1955, and unpublished data provided by Bureau of Census and Statistics.

Urban populations in the Union, on the whole, have more Bantu males than females, a feature of the migratory labour system, but the heavy preponderance of Bantu males in the Witwatersrand conurbation is unparalleled. The converse is

MAP 14



to be seen in the country areas, from which men are drawn to work in the towns. Although, according to the census classification, the urban areas of the Border Region have fewer males than females, the masculinity of their populations is still well above that of the rural areas. There are more Bantu males than females in King William's Town, Zwelitsha and Berlin, a reflection of the greater employment of male than female Bantu labour. It is possibly the number of Bantu women employed in personal service in East London which makes the masculinity of the urban population of the East London district lower than that of King William's Town.

When relating the masculinity of the individual sub-districts to that of the predominantly rural land area, both farms and reserves, half of this area has a Bantu masculinity of less than 82, and half of the area has values ranging between 75.2 and 89.1. The areas which have a high masculinity are clearly shown on Map .14. From a study of their distribution, it appears that there are several factors influencing the occurrence of a higher proportion of males in the population in these areas. The immediate surroundings of East London supply a good deal of labour to the industries of the city, as well as to the smaller farms specialising in market-gardening and dairying. The anomalous area of high masculinity, athwart the Buffalo River to the west of the city, may be the result of special circumstances such as road

building, but it may also be in part an effect arising from the timing of the census. The area to the south provides opportunities for labour on pineapple farms not only for men but for numerous women, and as the census was taken on a Tuesday, the women, brought from their locations for a week's casual labour, would be enumerated mainly in the sub-districts along the coast, west of East London; this in turn helps to explain the relatively low masculinity of the pineapple area, an area abounding with opportunities for farm labour. The rest of the White farming area tends to have a high masculinity, highest in areas where dairy farming for milk is prevalent.

Another notable area of high masculinity is in the region of mountain forests. There male labourers are in greater demand for heavy manual work, and few families are permitted to reside there.

It is particularly noticeable that the locations in the Bantu area next to King William's Town have high masculinity. These locations must be accommodating a considerable number of semi-permanent residents who go into town to work during the week, but who may well reside permanently at some greater distance from the town. It is doubtful whether the limited pull of industries in King William's Town would be sufficient to discourage those males looking for better paid work, for instance on the Witwatersrand, from leaving their homes. One must assume that a certain proportion of the males in

locations such as Tolofiyeni (masculinity 92.3), Jan Tshatshu's (96.1), Rhayi (87.4) and Ngxwalane (89.1) are adventitious and not permanent residents.

With respect to the areas with low masculinity, these are of several kinds. Most of the rural locations come into the category of areas with low masculinity. They may simply be the areas from ^{which} male labour is drawn to the towns, and particularly to pineapple farms. The low figures in Macibi (67.7) and Twecu (65.7) concern locations that are regularly visited by pineapple farmers in search of casual labour. Sometimes, however, the low masculinity seems to reflect the general shortage of land which occurs throughout Bantu areas in the Ciskei. The inability of local officials to allocate land for each married man has for the last 75 years been a feature of this area. Many of the men, especially from the smaller locations where land is particularly scarce, have been forced to migrate to the cities, leaving their families behind; in this class are Tapushe (54.3) and Anders Mission (60.7). The shortage of arable land is also more crucial in those locations which have been surveyed, since once the arable allotments have been surveyed for freehold or quit-rent tenure, and separated from the commonage, it is no longer possible for local officials to create more arable lands, while squatters are not allowed on the commonage, outside the residential sites. This regulation of occupance

also contributes to the low masculinity of locations such as Joseph William's (62.7), Mngqesha (69.0) and Peelton North (63.9). The low masculinity of locations south of Berlin may mean that some men are employed at Berlin, but the majority of the absent males are more probably in East London.

Soil deterioration and crop failure is less directly connected with migration of menfolk from locations, although it does undoubtedly lie behind much dissatisfaction with Bantu life in the country. It cannot, however, be a major reason everywhere, for in the areas where traditional life is strongest, in the Keiskamma River valley, masculinity is relatively high for the Bantu areas, such as in the locations of Xengxe (75.1), Menziwa (83.8), Qawukeni (81.6) and Khalana (79.5). King William's Town is too far from these locations to be an attraction for the daily commuter. It may be that the only alternative to staying on the land is a relatively clean break with the country, and semi-permanent migration to the cities.

It may also be mere coincidence that many locations with low masculinity such as Mamata (62.9), Mdizeni (61.0) and Tyusha (66.5) were the earliest to become Betterment Areas. The eventual effect of Betterment is, as will be seen in the next chapter, ^{but one} to control the use of land in much the same way as individual tenure tends to do.

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4. G 16 - '76.
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Chapter 9

GEOGRAPHY OF TRANSPORT AND COMMUNICATIONS

I. INTRODUCTORY

The history of the railways, and of the road system of the Border has been dealt with by H.H. Smith¹. In this chapter the growth of the transport network in the Border Region during the course of the settlement of the area will be examined, more particularly with reference to the links between the route ways and their physical background.

It is important to recognize that some routeways are natural, in the sense that they follow lines of easy passage provided by natural features, while others are man-made and may well have been created in the face of great difficulties. Whether natural or not, routeways are used for transport of various kinds, and they then become powerful agents of the environment, playing an important part as factors in further development. In the survey area there are few natural advantages for the creation of routeways. What assistance they^{form} of the country was likely to provide was not apparent until the area became better known through travellers, missionaries and soldiers. When the area was settled by White farmers, who needed communications to bring in their supplies and to send out their produce, the main lines of the network of routeways had already been laid down, and later developments have served only to emphasize the earlier patterns, except in one or

two isolated cases to be mentioned.

The presence of a relatively easy path from this part of the coastal plain to the interior of the country, is of paramount importance to the survey area. The line of mountains stretching eastwards for nearly one hundred miles from the Great Fish River, is continuously over 4,000 feet and in most places over 5,000 feet in altitude, and it has a steep southern face making road building difficult. This high range virtually terminates north of the survey area, east of the Amatole Mountains the higher ground being much more discontinuous, and there several lower passes are available. The chief advantage of using that east of Qaqazeli or Dohne Peak, a few miles from Stutterheim, and where the main line does not rise much above 3,000 feet, is that it avoids the crossing of the deeper sections of several rivers flowing eastwards into the Great Kei River, such as the Kubusi, Toise, Thomas and Thorne. Along this route lay an early road to various mission stations such as Dohne's, Goodwood, Howick and Whittlesea in what was known as Tambookie country. It has since been followed by the main railway line from East London to Queenstown and the north, and by the National Road from East London to Johannesburg.

Between the mountains and the coast within the survey area itself, the several sub-parallel and flat-topped watershed ridges have facilitated communication from the coast inland. The major watersheds carry important roads, and that between

the deeply entrenched Buffalo and Nanoon Rivers, the master watershed of the survey area, carries the line of railway from East London to Amabele on its way to the pass at Dohne. This ridge has also carried the main routeway between East London and the second town of the area, King William's Town, for more than a hundred years. As this routeway has always been of considerable importance for military activity, and for commerce between the two towns, the ridge along which it runs forms an axis of development, and a trunk from which nearby areas to north and south have been served. It is roughly oriented east-west, and also bisects the two districts of the survey area.

On the other hand the deeply cut river valleys, which score the coastal plain, are a major obstacle to movement parallel to the coast. This fact was noticed in the eighteenth century by travellers, and later by missionaries, working north-eastwards from the longer settled areas of the Cape. Missionaries were among the first White people to establish and make use of regular routes for waggon traffic eastwards. One of them, William Shaw, refers to trackless country or narrow pathways² made by the Bantu. When he had established his mission station at Wesleyville (Twecu), he pioneered a road³ thither some 8 miles from the Keiskamma River, where it linked up with an overgrown waggon route cut by soldiers and commandos in a previous Kaffir War, bushes and trees frequently

obstructing passage in those early days. He also mentions the difficulty of crossing the major rivers such as the Great Fish⁴ and Keiskamma⁵, where ~~the~~ proper rock-free drifts and approaches had to be made. Occasionally, as in October 1823,⁴ the Great Fish River, and doubtless others too, were impassable for several weeks due to floods after heavy rains.

The principal road constructors, however, were the military who had to open lines of communication for supplying advance troops and for rapid movement of armed forces during the several frontier wars, into the territory occupied by Bantu tribes. The road from Grahamstown to Wesleyville was later extended eastwards and became known as the Lower Kei Road, leading from the military headquarters at Grahamstown to the Great Kei River and beyond. At a later date, the Upper Kei Road, crossing the Keiskamma River at Line Drift, and running through King William's Town past forts established in the 1834 Kaffir War, was carried on past the site of Komgha, to meet the lower road at the Great Kei River. Routes parallel to the coast have not been easy to find, and when established have tended to become permanent, in the absence of obvious alternatives. It is interesting to note in this connection that until after the Second World War, the main route to the Transkei and Natal from the Eastern Province was along the line of the Upper Kei Road. It is only recently that a main road close to the coast all the way from Port Elizabeth to East

London and the Kei Drift has been contemplated, of which the completed national road from East London to the Kei Drift is a part: the section westwards is under construction.

Hindrances to movement, however, were not so common in the survey area as they were further west. The thorny Fish River Bush has a less formidable counterpart in the Keiskamma River valley, and many of the ridge-tops were open grassveld over 100 years ago. A note on Jervois' ^{British Kaffrarian in} map of 1848 reads, "The Road from King Wms. Town to the Kei excepting on the descent of that river is free from bush nearly all the way". Inland, however, the forested mountains of the Pirie, Izeli and Amatole Ranges were a very effective bar to movement, though the Forestry Department has at last opened them up to some extent with modern engineered roads.

For many years after the first White settlement was established in the area, the rivers were crossed by means of drifts only, the short Kaffrarian rivers with their irregular profiles providing many suitably shallow parts for drifts across them. The persistent use of some drifts such as Line Drift, Bridle Drift, Dube Drift, Ebb and Flow Drift (Keiskamma), and Old Drift (Gonubie), points to the careful selection in the past of suitable crossing places on the larger rivers. The earliest bridges at drifts on the larger rivers were constructed in the last decades of the 19th century. Causeways at Bridle and Dube drifts are relatively recent.

The rivers themselves are quite useless for traffic, being unnavigable except for a few miles from their mouths in the tidal reaches.

II. ROADS AND ROAD TRANSPORT

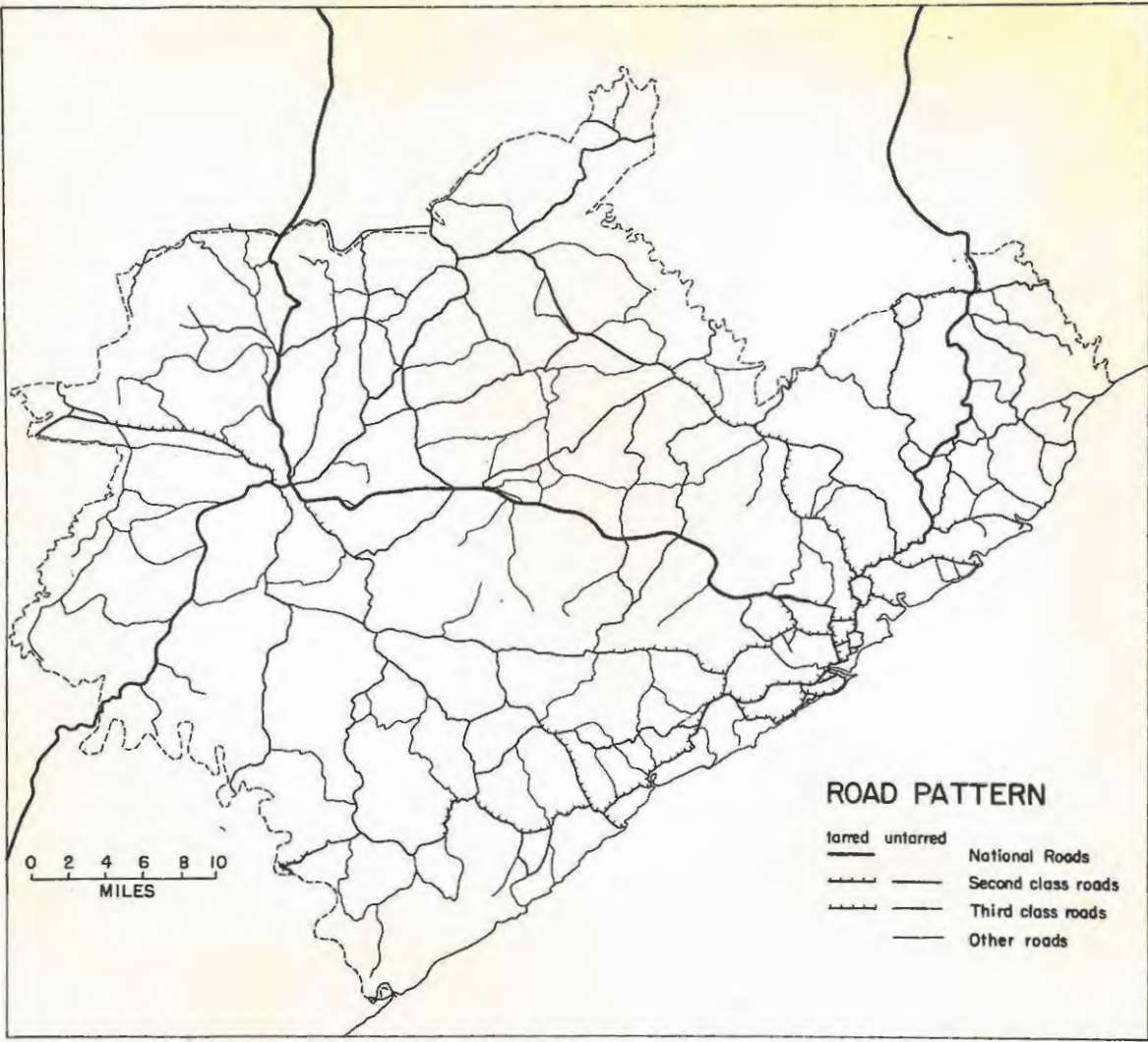
The present function of the road system is much as it was in the past. This is to provide links between the main towns, a feeder service for the railways, and links between the service centres and the farms and Native Reserves. The only radically new feature in the present road pattern is the national road system, sections of which have broken ground previously considered unsuitable for roads. The stretch between Izeli and Stutterheim is a more direct but more costly route than the old Great North Road which ran through the village of Kei Road.

After the military had inaugurated the first road system in British Kaffraria, Sir George Grey employed Bantu labourers, who were destitute because of the Cattle Killing, to maintain and enlarge the system of public roads of that province. The general absence of a proper metalled surface led to the erosion of the original roads, and to the creation of many alternative parallel roadways or tracks. The change-over from iron tyres of the old ox-waggon traffic to the pneumatic tyres of the modern motor-car, has assisted in the maintenance of the original roads. The former alternative tracks made by waggons are now largely grassed over, and are no longer

susceptible to erosion.

The pattern of the through roads in the survey area is depicted on the map opposite p. 161. In order to clarify the pattern, approaches to farms and other short stretches of road leading to single houses have been omitted. The resulting pattern shows how a district with low densities of rural population can do without a close network of minor roads. In areas with high densities of population minor roads are frequently intended for pedestrians, but in the survey area only the Bantu population depend principally on their own feet for locomotion. The Bantu areas are criss-crossed by pathways and trackways, mostly unfit for wheeled traffic; these are not shown on the map. In the map it is noticeable how these areas are poorly served by "other" roads. Roads through the Bantu areas are chiefly maintained for the commercial purposes of the White sector of the population, and they are rarely used by vehicles other than buses and the cars of traders serving the local inhabitants. The frequency of Road Motor bus services, run by the South African Railways, is much lower in the Bantu areas than in the area of small White farms nearer the coast, presumably a reflection of demand. On the other hand the Bantu areas are now regularly served by a series of private bus companies, organized solely for Bantu passengers; these radiate from East London and King William's Town in particular.

During the last twenty years a system of National Roads has been grafted onto the pre-existing road pattern. Three National Roads converge on the Border region, two joining at King William's Town, from the north and the west respectively, and the other coming into East London from Natal and the Transkei. These roads have been carefully engineered to cut down excessive gradients and to avoid sharp curves, and they now have a bitumen surface throughout, although some sections in the vicinity of East London are not up to National Road standard. A newly-made Provincial Road (tarred) is replacing the existing gravel-surface road westwards from King William's Town to Fort Beaufort. This links several small towns at the foot of the mountains to the metropolitan centre, East London. The other second class roads provide the main links between the towns of the survey area and Stutterheim, Komgha and Peddie. One second class road is under construction between Stutterheim and East London, via Kei Road and Macleantown. It links up with a long bitumenized stretch of road of lower standard between Macleantown and Abbotsford on the Transkei National Road. This, and various tarred roads from East London in the coast belt, serve a more intensive farming area, but they have not yet been extended for more than twenty-five miles in any direction. A considerable amount of heavy lorry traffic carrying pineapples into East London from the south-west uses these tarred roads, that to Kidd's Beach also catering for

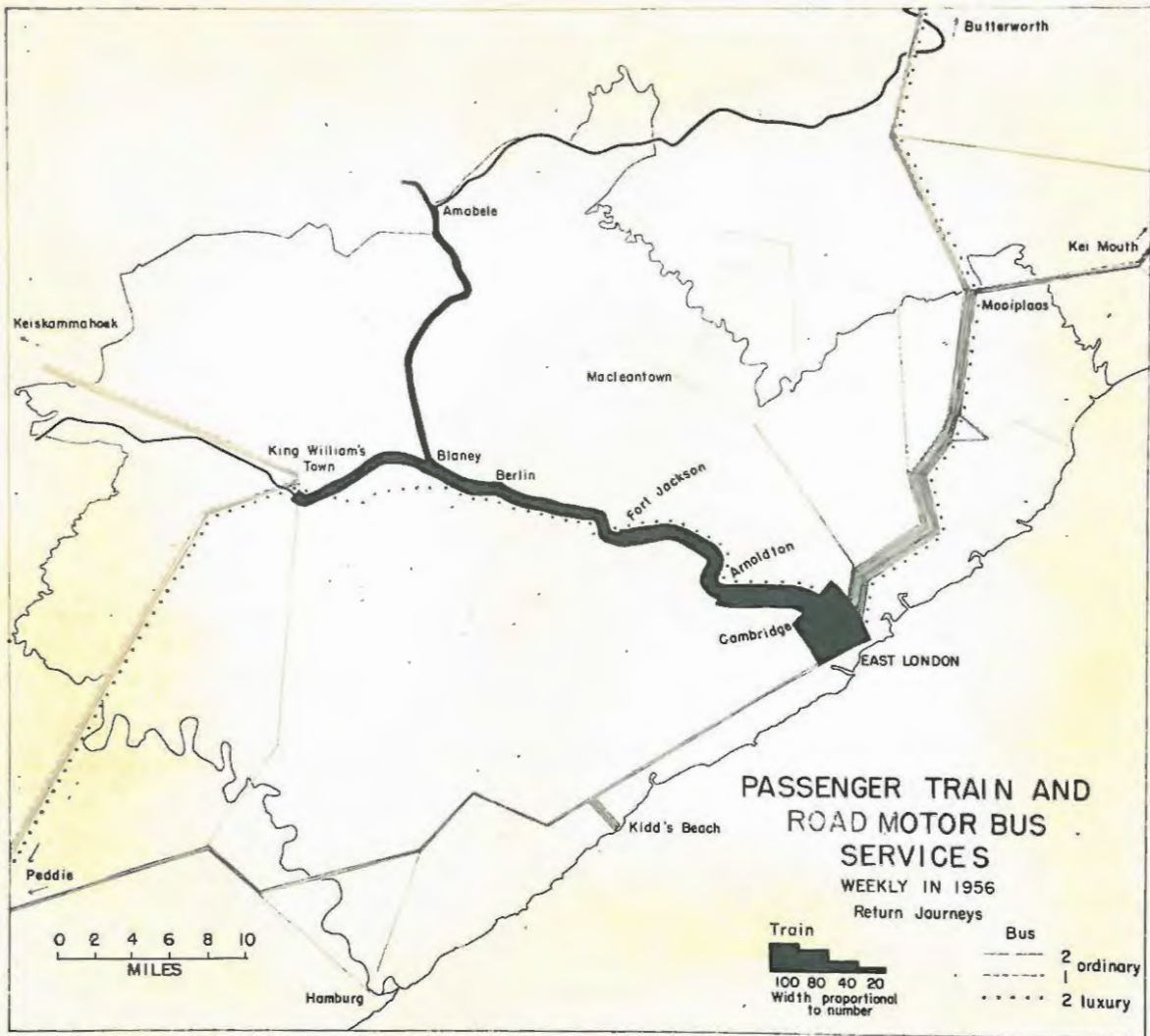


much holiday traffic by private cars in the season. The scenic drive through Buffalo Pass, upstream of East London, is now completely tarred, and it affords an alternative way of crossing the Buffalo River to avoid the harbour bridge. F.L.Moult⁶ avers that this road was constructed, in the first place, as a strategic alternative to the vulnerable double-deck bridge over Buffalo Harbour.

In general, the main roads are to be found following the ridge-tops with the minor roads branching off from them, both linking them and serving farms between them, crossing the intervening valleys at the more suitable places. The main roads also take advantage of the fact that three watersheds almost converge on Buffalo Harbour, giving East London a degree of natural nodality, which the West Bank Road, the National Road to King William's Town and the Transkei Road and its branch to Macleantown have confirmed.

Roads serving some of the White areas are only slightly more numerous than those serving the Bantu areas but the coastal belt, with its smaller farms and higher density of rural population, has a closer network of minor roads, which also serves a series of holiday shack settlements on the coast itself. This belt has a fairly frequent Road Motor bus service with East London, many of the small farmers sending cream and other perishable produce to town on these buses. A number of minor roads in the Berlin area have been improved

MAP 16a

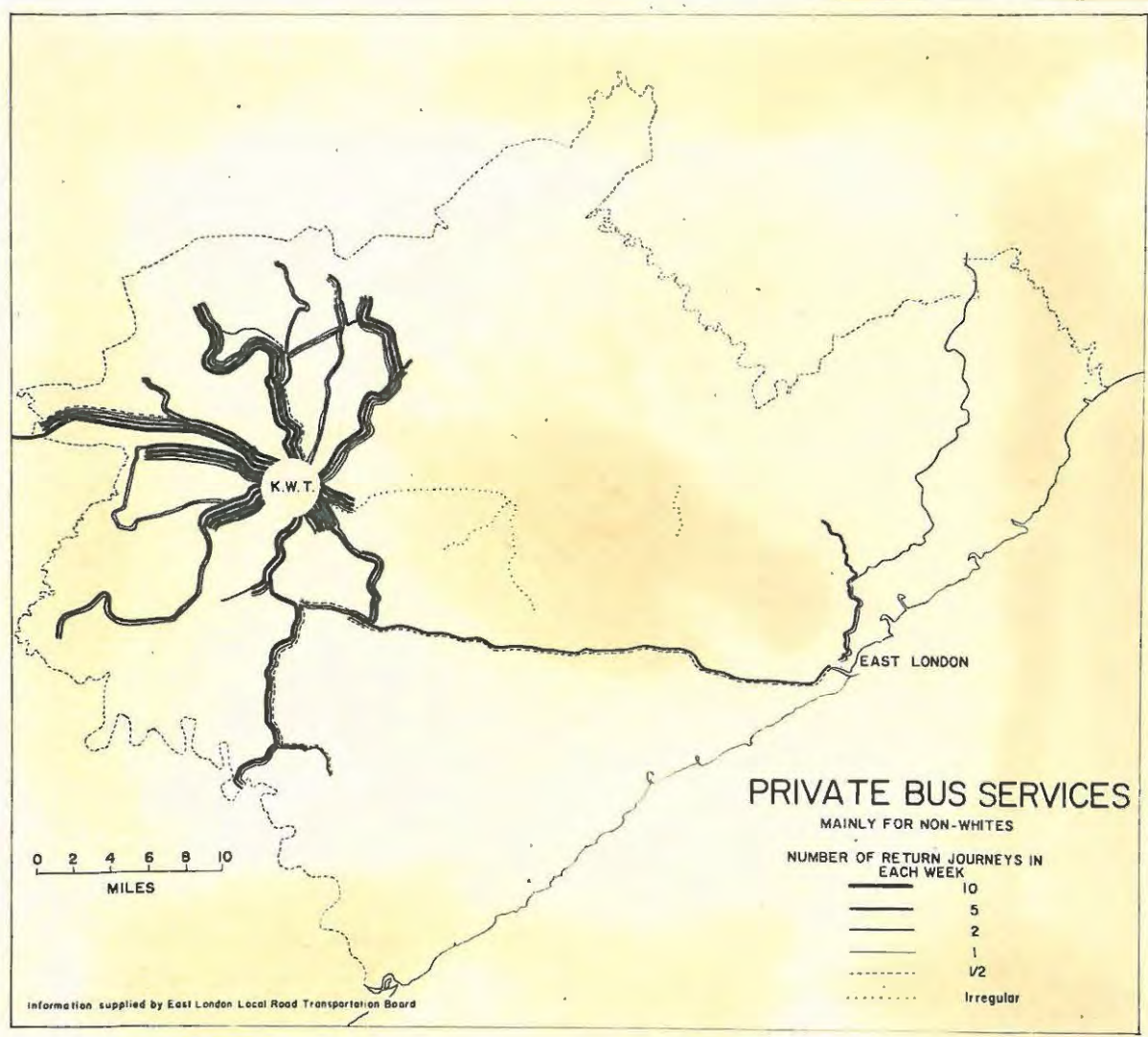


since the last war by the removal of gates at farm boundaries, and the substitution of cattle-grids. This has been occasioned by the development of a series of lorry routes from dairies in East London, which collect their milk from farms lying on these roads. The provision of grids greatly facilitates the speedy collection of milk, while ox-waggon traffic and animals on trek are provided with gates as before.

The small amount of wheeled traffic on public roads in the Bantu areas had not posed any great problems for the Ciskeian General Council, which maintained them. Roads are now to be the responsibility of the future Territorial Authority under the Bantu Authorities Act. Apart from the Road Motor services to Keiskammahoek and Peddie via Dube Drift and Line Drift respectively, the large Bantu area west of King William's Town is served only by private carriers. The infrequency of roads in the area, and the difficulty of crossing the Keiskamma River in order to link up with traffic on the Peddie side of the river, militates against the provision of more bus routes. Sutton's Drift (above Line Drift) is barely passable by motor traffic, but otherwise all other easy crossings of the river are used by buses.

As the Road Motor bus services act as feeders to the railway line, the main axis of the survey area is not used by them but only by the Luxury Bus service between Cape Town and Durban along the National Road, and that scarcely affects the

MAP 16b



region. There are areas away from the railway which are poorly served. These include parts where the size of farm is larger than average; for example, between the Buffalo River valley and the Gulu River, and between Fort Jackson, Macleantown and Kei Road which is precisely the area best served by milk collecting lorries operated by the town dairies.

III. RAILWAYS AND RAIL TRANSPORT

The survey area contains the coastal focus of the Cape Eastern Railway System, three lines converging on the port of East London. As with other systems, the main railway line was built essentially to open up the hinterland, and even today it still performs a most important function, together with its branch lines, by creating a regional consciousness throughout the wider area of the Border. The relationships between the port and the hinterland are mutual, in that the one could not do without the other.

Soon after the decision was made to build a railway from East London towards the newly opened Diamond Fields at Kimberley it became necessary to decide whether King William's Town was to be on this line or not. There was in fact doubt about the choice of route between East London and Kei Road, and this doubt persisted almost to the commencement of construction in 1874. Hesitation was chiefly caused by the

agitation of commercial interests in King William's Town, where it was rightly perceived that commerce with the Transkei would decline if the railway line from East London avoided the town. It was obvious from an examination of the topography of the area that, to take the line through King William's Town, an awkward deviation would have been needed if the main line followed the eastern route on the left bank of the Buffalo River. By using the main watershed between the Buffalo and Nahoon Rivers, the line could climb relatively easily via Berlin and Kei Road to the pass below and east of Dohne Peak, while a detour beyond Berlin to pass through King William's Town would have entailed a considerable descent into the Buffalo River valley both above and below the town. The Railway Commission⁷ records that a survey was made "to meet, if practicable the wishes of King William's Town". This followed representations made to the Cape Parliament by local interests.⁸

Had the west bank of the Buffalo River with the Needs Camp Ridge been chosen for the route of the line, King William's Town would have been on the main line. While there seems to be no grounds for believing that the railway was built on the east bank because the harbour wharves were on that side⁹, a proposal¹⁰ that the line should be on the west bank received no serious consideration, as the line would have had to make a difficult descent from Mount Coke into the

Buffalo River valley, and the route would have involved clearing a much greater quantity of bush. The more direct, easiest and more open route to the interior lay along the east bank watershed, avoiding the Buffalo River valley altogether and it was chosen for the main line, as it had been for the main road and the telegraph line twenty years previously, for precisely the same reasons.

Two alignments which would have included King William's Town on the main line were surveyed and were put on record¹¹. Each was very tortuous and meant a long and steep detour, descending from 1,800 feet to 1,200 feet, and then climbing up to 600 feet again, all in about 23 miles. These were abandoned as being too expensive, both to construct and to work. Instead, a branch line was taken down one of the routes from Blaney (now King's Cross) via Belstone, crossing the Yellowwoods River where the valley is still fairly open just above the falls. King William's Town remained the terminus of a branch line for nearly 30 years, until the line was extended to Cookhouse to joint the Midland system. The only other extension of the railway system within the two districts came at the same time, when a start was made on a rail connection with the Transkei.

In spite of the relative easiness of the route adopted, and the fact that the line was built as cheaply as possible, the Eastern system as originally constructed cost £10,222 a

mile to build, as against £9,682 for the Cape Midland system based on Port Elizabeth¹². Development proceeded from the coast inland, and for a time the railway was built with imported materials and used Welsh steam coal landed at East London until coal from Indwe inland became available. This was later replaced by coal from outside the Cape Colony when the system became linked with railways on the Highveld in 1895. The original standard of construction necessitated the regrading and realignment of the line between East London and Queenstown, work that was completed during the Second World War. The realignment has meant that several main road crossings have now been eliminated, none remaining on the National Road between East London and King William's Town, there being bridges at Southernwood, Cambridge and Fort Jackson.

Regrading the main line of the Eastern System has shortened the distance from East London to Amabele by 2 miles, and that to Queenstown by 20 miles¹³. Blaney Junction has been moved 1½ miles nearer East London. Realignment within the city of East London has removed the restrictions formerly hampering the expansion of the residential area of Belgravia, and has also made possible the convenient use of a stretch of commonage at the top end of Oxford Street. Frere Hospital is no longer cut off from the city by the railway, and the Museum and the extension of Oxford Street have replaced the old line.

To relieve the congestion on the old single track line between East London and Cambridge a spur was laid down from First Creek on the harbour to Chiselhurst. It was little used, however, as it was severely damaged by floods soon after its construction, and it survives only as a line of earthworks which has affected the shape of the East Bank Native locations.

Passenger train services from East London serve all parts of the Union, and there are through connections with the Rhodesias, Portuguese East Africa and the Belgian Congo. Superimposed on this traffic is a suburban service along the main line terminating successively at Cambridge, Arnoldton and Fort Jackson. The much greater frequency of local trains stopping at a number of stations and halts, serves to bring a number of daily commuters into East London from suburban and rural homes. It will also help to serve the new factory area at Wilsonia, bringing workers from the city. The map of transport services shows the great decrease in the frequency of services after each of the three terminal points. Between the city and Cambridge some 30 trains a day in each direction are paralleled by a bus service. East London's former tramway service did not reach Cambridge, but in general served suburbs to the east away from the railway line. The buses which replaced the trams in 1935 soon extended public transport facilities to the West Bank, and to other suburbs not previously served.

IV. HARBOURS AND HINTERLANDS

As the historical development of Buffalo Harbour has been treated by H.H.Smith in detail¹, it will not be repeated in this volume. However the advantages, if any, possessed by that harbour over other harbours will be examined in relation to their positions and qualities, and to the hinterlands they serve.

The advantages of the Buffalo River mouth over the other river mouths, both in the survey area and for some distance beyond it, are not outstanding at first glance. Both the Gonubie and Kwelera River mouths have roughly the same shaped estuary. The Buffalo River, however, has undoubtedly the longest straight estuary, and a greater and more regular flow of water, than the other rivers of its width on this part of the coast. It is these features which have contributed to the success of Buffalo Harbour, as opposed to Port Alfred where the Kowie River has less volume and more irregular flow. Boats may be taken over the river bars into several other rivers such as the Keiskamma and the Kei, but the Buffalo Harbour was at an early date adjudged the only one suitable for larger vessels. As a result of tidal scouring, produced by training walls, and additionally by constant dredging, an adequate depth of water in the approaches is made certain; this is now 35 feet below datum¹⁴. Port St.Johns has scarcely had an opportunity to develop in competition with the established

ports in the Cape and Natal, for it was in the independent native territories until 1884. A certain amount of native trade had been carried on through that port since the days of Governor Maitland¹⁵, and in a report of 1905¹⁶ the districts of East Pondoland are mentioned as trading through Port St. Johns. The relative importance of the Eastern Cape Province port up to 1909 is apparent from Table 28.

Table 28

TONNAGE OF SHIPS ENTERED AT CERTAIN CAPE PORTS 1869-1909

Year	Port Elizabeth	Port Alfred	East London	Port St. Johns
1869	94,657	4,205	1,202	-
1879	590,766	132,541	321,538	-
1889	1,075,433	8,603	931,872	988
1899	2,027,674	NIL	1,833,188	7,350
1909	2,688,542	NIL	2,445,257	9,865

Sources: Cape of Good Hope, Blue Books and Statistical Registers.

The temporary success of Port Alfred, and the dwindling of trade through Port St. Johns in recent years owing to silting means that East London is now the only port between Port Elizabeth and Natal.

It was supposed in the earliest days of British Kaffraria, that the improvement of Buffalo Harbour would put that province on its feet¹⁷. In King William's Town, which was in keen competition with Grahamstown for frontier trade, the Gazette commented "And is it likely that we shall ever rise above nothingness unless East London be opened?"¹⁸ It is certain

that unless the facilities of the port had been kept up to the standard required for ships calling at Table Bay and Durban, the development of the Border would have suffered considerably. Political rivalries have in fact been powerful forces in ensuring "equal treatment" for the three main Cape ports and their railway systems¹⁹, and since the South African War for these and Durban. A confidential report made to the Chief Traffic Manager, Cape Town, reveals that commercial interests in the Cape were anxious lest railway extensions towards Natal in the years of expansion after the Anglo-Boer War (under the Railway Conference) would lead to rival extensions from Natal, capturing markets which had been Cape preserves. The removal of customs barriers between Natal and East Griqualand (Cape) had led to an increase in the trade between them, to the detriment of East London. Railway extensions were made to Umtata and Maclear as recommended by the Chief Traffic Manager, Cape Town, and a later branch was taken from Imvani to Qamata. On the other hand the nearness of East Griqualand to Natal was recognised, and that area was linked by rail to Pietermaritzburg and so to Durban. The gap between the railheads still exists as an artificial barrier, separating the hinterlands of East London and Durban in a position that is not equidistant from the two ports. The economic hinterland of East London thus extends further east than it otherwise would.

V. AIRPORTS AND AIR TRANSPORT

There are two airfields in the Border Region, one of which, Collondale near East London, has national significance. It actually replaced a smaller aerodrome at Woodbrook, the site of which was limited by the proximity of the Buffalo River valley, which left flat ground only about half a mile across to the slopes near Potter's Pass. Collondale is at present being improved and extended. The climatic background and the strong cross-winds affecting Collondale were mentioned in Chapter 4. Municipal control will shortly give place to State control there, which will place East London on an equal footing with the other cities of the Union.

The Ciskei Airport near King William's Town has little more than local significance. During the recent reconstructions at Collondale, the Ciskei Airport has acted as a base for a feeder service, to connect East London to the national network of air-routes. The maintenance of air-routes connecting East London with the rest of the Union, and thence with other countries is chiefly important for business and tourism, and negligible for the transport of goods. A recent venture to link East London, Queenstown and Umtata by local air-services has not met with sufficient support. Consequently East London is but one point of call for the national air routes, and is not in any way a regional centre or a junction of air-routes. The number of air services varies with the

detailed arrangements for traffic within the organization of South African Airways, but because the demand for services is limited there are relatively few flights. East London and Kimberley are in fact both marginal to the main flow of communications in the country and are thus at the bottom of the list in Table 29.

Table 29

NUMBER OF INTERNAL AIR SERVICES - IN EACH DIRECTION WEEKLY

Johannesburg	50	Bloemfontein	11
Cape Town	27	Kimberley	10
Durban	26	East London	10
Port Elizabeth	19		

Source: South African Airways Timetables, June 1960.

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Chapter 10

PLANNING AND CONTROLS AFFECTING LAND USE

I. INTRODUCTORY

In the Border Region the delimitation of land into Native reserves and land available for White settlement was largely fixed at an early date, and in the latter the pattern of settlement and the sizes of farms were, in a sense, largely planned from the first. In the reserves the Bantu continued their traditional tribal land tenure, in striking contrast to the system of individual land ownership in White areas. The traditional Bantu system of agriculture, however, now being carried on within demarcated areas, has been subject to more restraint than hitherto during the past hundred years.

Outside the reserves the land was nearly all surveyed for occupation by White farmers. This was carried out with a very imperfect appreciation of the physical nature of the country, and with the most limited knowledge of its agricultural potential. Different policies and opinions, both often ill-informed, led at different times to the survey of farms of widely differing sizes. In some areas the farms were much too small, reflecting the prevailing tendency amongst administrators, in the 1850's particularly, to overestimate the capabilities of the land. The following opinion is typical: "It (British Kaffraria) is unquestionably the most favoured district in South Africa, possessing peculiar

advantages of soil and climate, and is capable of supporting a far more dense population than any portion of the country within the old boundaries of the Keiskamma or the Fish River, or of any of the interior part of the colony ..."¹ This was based on a superficial view of the vegetation, which was apparently richer than further west or north-west where it was more arid.

The experience of farmers and administrators in the next fifty or sixty years led them to a different view of the carrying capacity of the land, while the position in the Native reserves, after the recovery from the disastrous Cattle Killing of 1857, was aggravated by a steady increase in population on a limited amount of land. Throughout South Africa the exploitation of the natural resources of the vegetation and of the soil, coupled with the disastrous effects of some droughts, gave rise to the notion that the country was drying up.

Official investigation of droughts, such as those in 1914 and 1920², eventually led to a greater interest in conserving resources. Comprehensive legislation was introduced only in 1941 and 1946³. Earlier efforts to conserve resources had been made in the White areas, but related solely to Crown Forests. Certain trees were protected by legislation in 1860, and veld utilization was controlled in 1888⁴. Uncontrolled land utilization continued elsewhere, both in privately owned

White farms and in the Native reserves, until after the Second World War. In the former areas control was not introduced until after the passing of the Soil Conservation Act in 1946, the first area to be affected being proclaimed only in 1949. In the reserves, after the passing of the Native Trust and Land Act in 1936, some measures were taken to encourage the protection of the soil and vegetation, and some locations in the King William's Town district accepted Betterment in principle, according to the provisions of Proclamation No.31 of 1939. Because of the war, however, no conservation work was carried out for some years in the Ciskeian reserves. After the war a new type of Betterment Scheme was launched by Proclamation No.116 of 1949. Thus the act of 1946, and the proclamation of 1949 subsequently amended, are the basis of the present regulation of land use practices in the Border Region.

II. SOIL CONSERVATION IN WHITE AREAS

There are two types of soil conservation schemes in these areas: one applies to a whole catchment area "the protection of which is deemed to be of national importance"⁵; and the other applies to a group of farms with common problems, the owners of which are responsible through a committee of farmers for soil conservation in the area.

The Buffalo Soil Conservation area, the only example of the first type in the Border Region, was proclaimed in 1949

and covers a large heterogeneous area, including some Bantu areas within it, the protection of those being the responsibility of the Native Affairs Department. The lands of the Department of Forestry within it also lie outside the control of the Extension Officer, King William's Town, who operates the soil conservation plan. This plan was designed broadly to achieve the best balance between the utilization of the resources of the natural environment and their preservation, with the minimum interference with present farming practice. Some bad trends and practices were singled out for eradication, and other positive measures were to be encouraged, if not enforced. The eventual aim was to increase the productivity of the land when stabilised at the level which would ensure the permanence of maximum productivity⁶. The details of the scheme are outlined in Appendix 2.

At the time of the field survey, three other soil conservation schemes of the second type were in force in the White farming areas of the Border Region. Rather different areas with different types of farming were affected. Two (the Nahoon-Gonubie and Kabousie Basin) in the Kei Road area, were in a region of large farms going in for wool and beef production. The other, lying astride the Buffalo-Gulu watershed west of East London, was a mixed farming area with an emphasis on cattle farming for cream and beef. The general principles of soil conservation as applied to the Buffalo Soil

Conservation Area were also applied to these areas. Depending on the variation in type of farming, different aspects of conservation were emphasized locally.

In the ~~Nahoon-Gonubie~~ district, stock-farming areas near Kei Road, continuous grazing and indiscriminate veld burning were to be replaced by rotational grazing by both cattle and sheep, together or by cattle alone, and by restricting burning to the period after the first good spring rains only. Since the area was considered adapted to livestock farming, the growing of cash crops was to be discouraged in favour of cultivation for supplementary feeding stuffs including silage. Generally, cultivation was to be reduced as much as possible. No virgin land or land with a slope of more than 10° could be ploughed without the consent of the committee for the district.

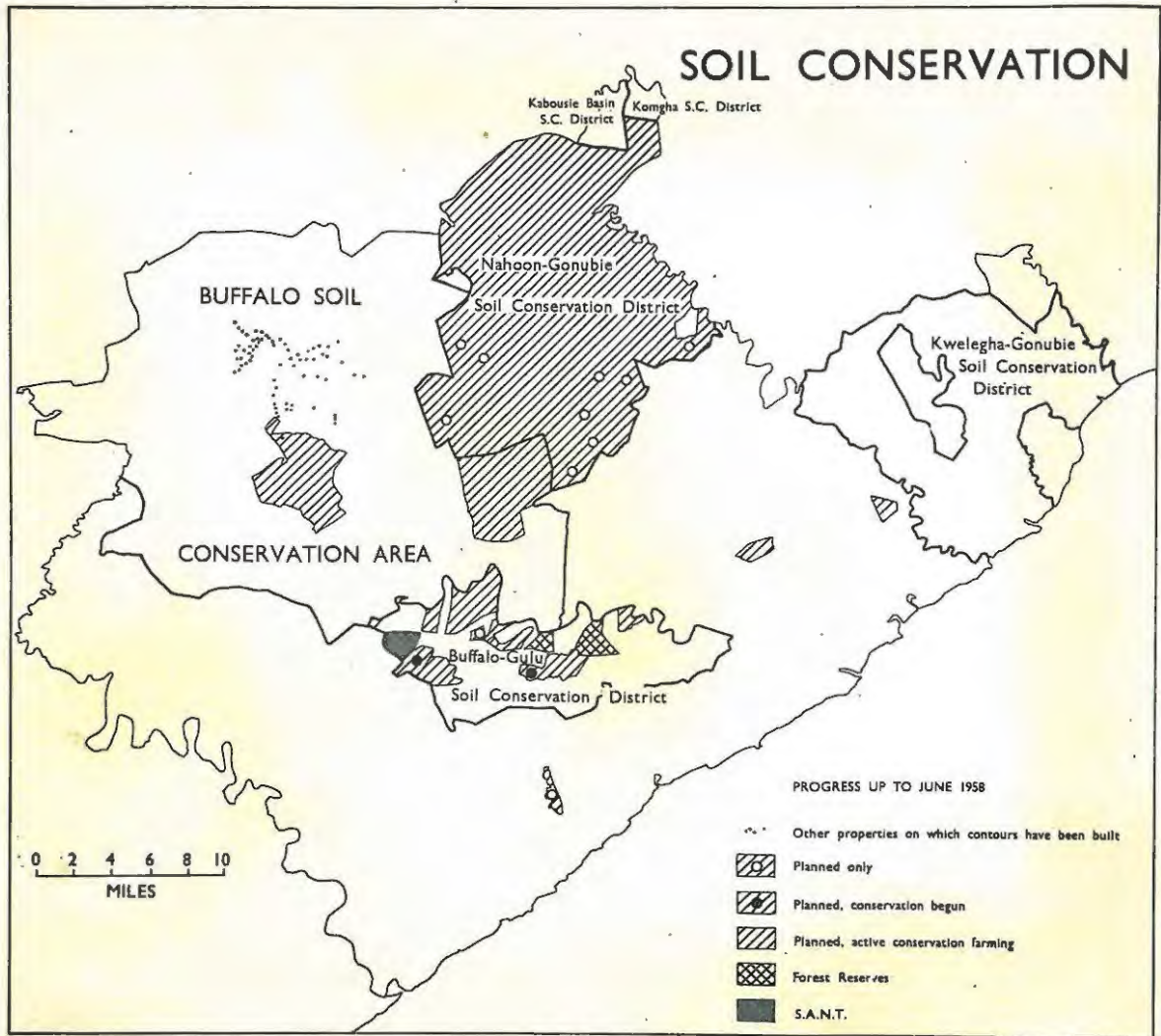
In the Buffalo-Gulu stock-farming and market garden area west of East London, sheep farming was not deemed to be suited to the area and was to be discouraged. Where kept, sheep were to graze with cattle. Dairy cattle were to be gradually restricted to pedigree stock, but cross breeding of beef animals was to be allowed.

In all cases in which areas have been proclaimed as conservation districts, plans are made of individual farms to suit the nature of the farm and the policy of the farmer. In the drawing up of a plan the carrying capacity of the grazing is assessed, and the veld is divided into camps for

rotational grazing. "It is impossible to lay down the carrying capacity of all farms for all times since conditions will change as conservation farming proceeds."⁷ Once the farmer has proposed a plan of conservation farming for his holding, and has received the district committee's approval, he is responsible for carrying out conservation measures, and the construction of all works except those specifically to be undertaken by the Department of Agriculture. If a farmer fails to prepare a plan, the committee and departmental officials prepare a plan for his farm. Maintenance of soil conservation works is normally undertaken by the farmer. In the Nahoon-Gonubie district, the Government assists financially those farmers who undertake soil stabilisation work and the building of dams, drinking troughs and silos before a plan is produced, provided that they automatically fit into a soil conservation scheme. In that area many farmers have carried out works of this kind without applying for financial help, and several were practising conservation farming, in part, before the proclamation of that district in 1948. In districts so far proclaimed, soil conservation farming has had the effect of reducing the arable area slightly, and has brought the introduction of pastures and of more fodder crops.

In addition to the several Soil Conservation districts outlined on the map opposite p. 179, there are a few individual farms which have been proclaimed soil conservation

MAP 17



areas at the instigation of their occupiers. The state of progress of soil conservation farming in the two districts is indicated on the map. The extension of conservation farming to the Pineapple Belt south-west of East London, is at present under consideration, but at the time of the survey the preparation of a scheme which satisfies all requirements had yet to be achieved. The prohibition of clean cultivation of close-rowed crops, which would include pineapples, on slopes of more than 10° as in the Buffalo-Gulu district, would cut out much of the land at present growing pineapples. In this connection it is noteworthy that farms in the Buffalo-Gulu district which have a considerable acreage of pineapples have not been planned.

In the Nahoon-Gonubie district, the planning of which was nearly complete by the winter of 1958, there were an estimated 150 miles of contour banks, 207,205 yards of fencing, 187 dams, 4 reservoirs and 5 silos constructed under departmental schemes by the farmers⁸. The Kwelegha-Gonubie district is newly proclaimed⁹.

III. SOIL CONSERVATION IN THE BANTU AREAS

The general principles of conservation farming in the Bantu areas are the same as in the areas of White farming. The main difference is one of dealing in the former with a conservative peasantry enjoying rights of communal tenure¹⁰,

many aspects of which are being affected by sound conservation measures. The changeover from their traditional methods to those which are the result of the coming of Betterment, is far more radical for the Bantu than for the Whites, including even the German settlers who have a type of communal tenure. The Betterment scheme inaugurated by Proclamation 116 of 1949 (now amended by Proclamations 25 of 1951, 56 of 1954, and 303 of 1957) was incorporated in the recommendations of the Tomlinson Report¹¹. The progress of betterment is two-fold: soil stabilisation and land reclamation, a distinction clearly stated in the Tomlinson Report. "Stabilisation includes whatever work is necessary to stop further deterioration of the soil and its vegetation. Reclamation covers all the work which is necessary to restore land to economic productivity after it has deteriorated through bad usage."¹² The problem of overstocking and soil erosion have been noticed in the Ciskeian reserves for many years. The urgency of the situation demanded action, and the result has been that farming in the Bantu areas has already changed, and will be in due course almost completely altered into a planned economy based largely on mixed farming. It is the aim of Government policy to move those who cannot be supported by farming to urban townships, which will provide a labour force for industries, or for services of other kinds. A further explanation of the stabilisation programme is given

in a recent report of the Native Affairs Department¹³: "By stabilisation is meant the demarcation of permanent residential areas on suitable land, the selection of arable land suitable for the cultivation of field crops, the determination of the carrying capacity of the grazing concerned, the protection of water resources, the assessment of the number of economic units or farm holdings and the selection of suitable localities for rural villages, where necessary after the determination of the number of persons and animals and their requirements for the particular location."

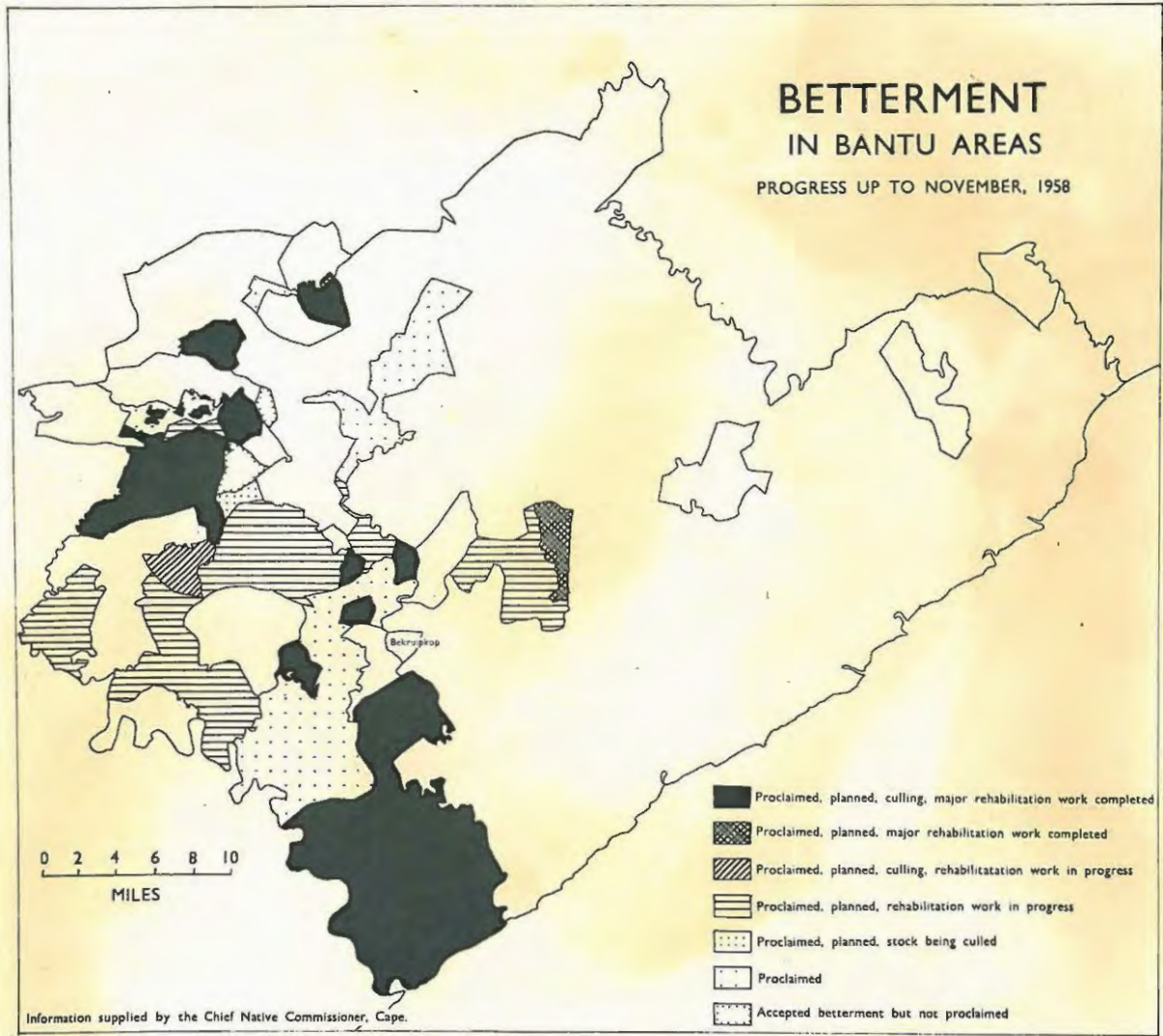
By Proclamation 116 of 1949, considerable powers were conferred on the Native Commissioner, or his authorised deputies, to carry out measures necessary for conservation. The Chief Native Commissioner is responsible for culling cattle considered to be in excess of the carrying capacity. To the Minister of Native Affairs is reserved the right to suspend the rights of any person over land in a Betterment Area, for the purpose of reclamation or conservation, and He may also terminate the right to the use or occupation of land for the prevention of or reclamation from soil erosion, to stop sand drift, to conserve water resources, to stop erosion, and to do so in any land outside those demarcated for agricultural or residential uses in Betterment areas. These powers might be delegated to the Secretary for Native Affairs or to the Chief Native Commissioner¹⁴. All land

belonging to the South African Native Trust in Released Areas is ipso facto a Betterment area in terms of Proclamation 116 of 1949.

The Bantu are being encouraged to participate actively in the rehabilitation of the Reserves in accordance with the new policies of "self-help" and "autogenous development". Prior to the inauguration of the new policy some four or five years ago they "for the most part remained mere spectators". The Native Affairs Department's policy is slowly to introduce changes in the way of life of the Bantu likening its task to that of "the schoolmaster who has to adapt his lessons to the pace of the slower pupil".¹⁵ Conservation works are not begun until the Bantu have shown signs of helping themselves, by limiting the numbers of livestock, and by providing free labour for fencing, dam building and so on. It is the policy of the Department to give rewards for such co-operation; such inducements are the provision of material for six or seven (rather than 4 or 5) strand fences, the loan of machinery and the beginning of conservation works.

Proclamation 116 of 1949 did not lay down a phased programme which was to be followed in rehabilitating the Bantu areas. Since 1953, however, the following programme has been followed in all Betterment areas.

1. The determination of a number of economic farming units, appropriate to the local natural conditions¹⁶.



2. The determination of the measures necessary to save the soil and vegetation.
3. The determination of the number of human and livestock population which the area can economically support.
4. Explanation of the local situation to the appropriate Bantu authority¹⁷.
5. In consultation with the people and the authority, the separation ("sifting") of bona fide farmers from migratory labourers at present living in the Reserves.
6. The commencement of soil stabilisation once there is evidence of livestock limitation and a general willingness to accept the implications of Betterment.

The most noticeable effect of Betterment, on locations adopting soil conservation farming, are the better condition of the veld, unusual crops grown on contoured and protected lands, and livestock in better condition. The progress of Betterment, which has been extended rapidly to more than half of the locations in the King William's Town district in various degrees of completion, is detailed on the map opposite page 183. Specific instances of conservation farming are noted in Chapter 12.

Details of the actual measures taken to stabilize and reclaim Bantu areas proclaimed as Betterment areas are outlined in Appendix 2.

IV. MARKETING CONTROLS

The increasing population of the Union, and the dislocation of trade caused by the two world wars, as well as the fluctuating condition of demand in the world market, have led to the imposition of controlled marketing, as part of a policy which aims at satisfying the local and national market with South African produce. In fact for certain food products, such as maize, meat, dairy produce and chicory, there has sometimes been insufficient local production to supply the population. This has been so even with a dominant policy of self-sufficiency followed since the First World War. With a background of fluctuations in primary agricultural production due to the unreliable climate, and fluctuations in prices for primary produce in the international market, it became clear that to stimulate local production, especially for the domestic market, prices within the Union would have to be above those on the open market. The rise in prices at the time of the First World War, and the increased demand for produce from all sections of the population, greatly encouraged increases in agricultural production. These increases were maintained in the next decade, and small surpluses were exported, while the import of a few items was discouraged by tariffs. When prices fell after 1929, stricter control was introduced, maize, dairy produce and meat being the first to be dealt with¹⁸. The export of

surpluses at prices well below those prevailing in the Union was deliberately fostered, and imports of ~~small~~ produce were severely restricted. Marketing control has had some small influence on the production of certain commodities, and hence on the types of farming practised in the area.

(a) Control of maize

In 1931-32, the first year of control for maize, the average export price for grade No.2 flat white was 3s.6d. a bag, and the Central Agency for Co-operative Societies paid 7s.6d. a bag. Periodically afterwards maize has had to be imported to make up the shortfall in local production¹⁹. Because of the exceptional drought in 1932-33 maize had to be imported again, as has also happened in 1945-47 and 1952-53 when demand outstripped supply.

Since the reconstitution of the Mealie Industry Control Board in 1935, the King William's Town district has remained outside the provisions of controlled selling, and the East London district has been a district of "Area B". In the latter district, this has meant that producers have been able to sell maize only to the agents of the Control Board. The level of internal prices, however, and remuneration for exported maize, is at a nation-wide level. One of the objects of the 1937 Marketing Act, which concerns most Control Boards, is "to distribute the loss in export over the whole industry".²⁰ The Social and Economic Planning Council

considered that the operation of the control board system of internal price support, and the subsidizing of exports, had led to the extension of cultivation into marginal areas physically unsuited to crop husbandry.²¹ This may have occurred in some areas, but there is evidence that the percentage of maize in the total area of farms has steadily decreased in the two districts we are here concerned with. The effect of control on the extent to which maize is cultivated in this area is, however, difficult to assess.

The Planning Council also held that the Government's price policy after 1925 "tended to promote mono-culture and intensive arable farming in all marginal areas". This has not been true of maize in the Border Region, which can be considered a marginal area. Poor years for the main maize belt hit the Border area very hard. Apart from the decline in the area under maize, there has been a general decline in the production of maize for sale. More and more maize is being kept for consumption on farms in the survey area. On the other hand, in the main Maize Belt in the High veld there appears to have been a tendency for the proportion of maize grown for sale to increase in the period since control has been exercised. Tables 30 and 31 give a comparison between the two Border Region districts and three in the Highveld maize region. The three districts chosen for comparison have been little affected by boundary changes since 1930, and lie in

different parts of the Agro-Economic Survey's "Cropping Areas of the Inland Plateau (B)".

Table 30

PERCENTAGE OF THE AREA OF FARMS UNDER MAIZE

Year	Border Region		Highveld		
	East London	King William's Town	Standerton	Reitz	Lindley
1934-35	5.3	5.7	20.8	25.9	20.0
1936-37	5.1	5.3	20.9	21.2	16.0
1938-39	4.7	4.5	20.7	21.7	16.5
1945-46	5.5	6.1	18.8	19.7	13.3
1949-50	5.8	7.2	22.6	21.5	18.7
1954-55	4.3	5.4	25.4	25.5	21.9

Source: Agricultural Censuses.

Table 31

MAIZE: TOTAL PRODUCTION BY WHITES AND PERCENTAGE OF PRODUCTION RETAINED FOR CONSUMPTION ON FARMS

Year	East London		King William's Town		Standerton		Reitz		Lindley	
	Bags	%	Bags	%	Bags	%	Bags	%	Bags	%
1933-34	6144	98	9760	91	737075	28	155239	48	169080	42
1934-35	48240	67	46837	55	691435	22	369523	24	386829	20
1936-37	13294	72	8851	78	889119	24	325986	30	293993	29
1938-39	35142	83	34587	87	1117327	22	425020	24	423739	24
1945-46	1251	99	1738	91	212609	49	243638	29	136471	41
1949-50	3638	85	5997	82	629962	19	497369	16	425479	19
1954-55	26563	86	28671	81	1189523	12	602337	17	470509	19

Note: 1933-4, 1945-6, 1949-50 were years of drought and crop failure.

Source: Agricultural Censuses.

Since the Second World War, prices for maize in export markets have remained above those for consumers in the Union. The Mealie Industry Control Board has been able to control prices so that surplus maize was sold to advantage at times of high prices, such as during the Korean War and the Suez crisis. At the present time, when grain prices are low because of surpluses, both the producer's prices and the prices to consumers have been maintained at remunerative levels at some cost to the Stabilization Fund.

(b) The Chicory Control Board

The amount of chicory grown in the survey area is small compared with that in the Alexandria and adjacent districts, to the south-west of the survey area ^{the former} being the main producing area in the Union. The development of chicory production within the survey area apparently resulted from a stimulus to grow the root for the domestic market, when imports from Europe were cut off during the Second World War. From the time of the First World War, when imports from the Low Countries also ceased, most of the producers of chicory root had been in the Alexandria district, and adjacent parts of the Albany and Bathurst districts. Resumption of imports between the wars led to declining and fluctuating prices for producers, who attempted to co-operate to combat their bad effects. In 1940²² the Chicory Control Board was set up to control the industry. As the Control Board has a producer's majority,

and the majority of the producers are located within easy reach of Alexandria, the industry became centred there, and recent actions by the government have confirmed the pre-eminent position of the Alexandria area, so that when new electric drying kilns were established by the Control Board, Alexandria was naturally chosen for their location.

Coffee manufacturers at East London need a certain amount of chicory for blending purposes, and chicory production near East London was aimed at supplying this demand. In 1948²³ the Chicory Control Board extended its control to the East London district, which meant that producers were then obliged to sell to the Board only. Chicory has therefore to be sent to Alexandria to be graded, although it may be dried on the farms of the producers. Thus though the Board's policy of control of the industry is for the benefit of the producers generally, the Border producers, who have to stand high transport costs for their product, are at a disadvantage compared with those near Alexandria. Some measure of the movement of chicory into and away from East London can be gained from the following table. It is probable that East London's demand for chicory will eventually be met solely by the producers near Alexandria, and then chicory will cease to be grown in the survey area.

Table 32

TRANSPORT OF CHICORY ROOT BY ROAD AND RAIL (SHORT TONS)

Year ended 31st March	1951	1952	1953	1954	1955	1956	
OUTWARDS from East London	--	--	154	38	170	168	Road motor service
INWARDS to East London	58	42	164	43	142	153	Road motor service
	--	--	--	--	--	31	Rail from Cape Midlands

-- Figures not available.

Sources: System Manager, East London; General Manager,
South African Railways; unpublished statistics.

(c) Control of the dairy industry

As in the case of maize, the control of production and exchange of dairy produce has been considered mainly on a national scale, as the producing areas are widely scattered throughout the Union. In having a growing market in East London for fresh milk, and with two creameries in the neighbourhood, the course of dairy production in the survey area has not been particularly affected locally by control. Control was originally introduced in 1930 to combat the effect on a growing industry of falling prices, particularly in the export market. Surpluses of butter and cheese, which resulted from increasing production in the periods before the war, were exported, and at the same time expansion of

production was encouraged. Renewal of difficulties in the disposal of surpluses was partially met by the State-Aided Milk and Butter Scheme of 1935. This supplied school children and underprivileged classes with milk and butter at exceptionally low prices. The Second World War had the effect of increasing demand, as a result of the increasing wage levels of many people, and by the arrival of ships which needed victualling at South African ports. Since the war, new export markets in adjacent African territories and elsewhere have been developed. To overcome the embarrassment of fluctuations in surpluses for export, the Control Board guarantees the supply to importers of South African butters and cheese. Although this sometimes means importing butter for home consumption, it facilitates the disposal of surpluses. In fact, most of the increasing demand for milk, butter and cheese is met from production in the Union or South West Africa.

The table below gives some idea of the growth of the local market for butter and cheese in East London. In twelve years the amount of butter sold has doubled, and that of cheese has increased by nearly 50 per cent. The effect of dry seasons with contracted production, specially in 1948-49, can be seen in temporary declines in sales.

Table 33

SALES OF CREAMERY BUTTER AND FACTORY CHEESE IN EAST LONDON

Year	Butter lbs.	Cheese lbs.	Year	Butter lbs.	Cheese lbs.
1945-46	1,108,606	409,181	1952-53	?	?
1946-47	996,082	464,174	1953-54	1,938,000	539,000
1947-48	1,275,454	527,576	1954-55	2,044,000	583,000
1948-49	191,154	384,443	1955-56	?	?
1949-50	1,543,451	445,881	1956-57	2,107,000	601,000
1950-51	1,810,723	496,801	1957-58	2,207,000	600,000
1951-52	1,674,000	453,000			

Source: Annual Reports of the Dairy Industry Control Board.

The main factor in the supply of fresh milk to the urban market in the Border Region is, as elsewhere, the seasonal variation in production. In an attempt to regulate and to provide a more even supply for the market, co-operatives acting as agents for the Control Board have devised a system of payments related to quota assigned to individual producers. There are also premium payments for milk produced in the lean winter months. In the summer months probably half the supply is diverted to factories for processing, for confectionery and for other purposes.

The combined market for fresh milk in the Border region is about two million gallons a year. Most of this is supplied from the two districts but some comes from an area further away²⁴. By 1955 production of milk in the two districts had

so increased that 31 per cent was sold to factories whereas only 15 per cent had been sold to factories in 1950.

(d) Control of the meat industry

The control of the meat industry must also be viewed against a background of low prices for producers during the inter-war depression. From being a net importer of beef before 1914, the Union became a net exporter between the wars, as a result of the surplus supplies built up from growing herds of cattle. During the Second World War and afterwards, the domestic demand could barely be satisfied, if at all, from home production, and this position is substantially the same for mutton. In this more recent period, the function of the Meat Industries Control Board has largely been to furnish an equable supply of beef and mutton at each of the main urban markets. Prior to 1956, the Board followed a policy of paying minimum prices for slaughter stock, and seasonal premium prices for cattle. These prices were to encourage the production of slaughter cattle for months of normally short supply. Since 1956 the Board has maintained a price support policy for beef, although public auctions have been resumed, and seasonal premiums were again paid in the 1957-8 season. By this policy of maintaining prices for producers, and buying in meat surplus to immediate requirements in the controlled area of East London, the Board has managed to keep

cattle and sheep ~~rearing~~ for slaughter on a remunerative basis. Had it not been for this, there would have been little incentive for some livestock farmers to concentrate on high grade oxen for slaughter, or on the development of the Dohne Merino which is as useful for mutton as it is for wool. The fluctuation in wool prices which has been experienced, ^{recently} has emphasized the value of the Meat Board's policy ~~for~~ the owners of dual-purpose sheep.

Producers' prices for wool are to a certain extent maintained by the South African Wool Board's scheme of buying up surplus bales at auctions. Neither the slight depression in wool prices which preceded the inauguration of this scheme in March 1958, nor the scheme itself, have had any marked positive effects on sheep farming.

REFERENCES TO CHAPTER 10

1. Memorandum from Deputy Assistant Commissioner, Grahamstown, on settling the frontier with convicts. No date given (but before 1855). Cape Archives, GH8/43.
2. Report of the Select Committee on Droughts, Rainfall and Soil Erosion. S.C.2 1914. Final Report of the Drought Investigation Commission. UG 49 1923.
3. Forest and Veld Conservation Act, No.13 of 1941. Soil Conservation Act, No.45 of 1946.
4. Cape of Good Hope, Act No.28 of 1888.
5. Official Yearbook of the Union of South Africa, 1956-7, p.525.
6. Plan for Reclamation and Conservation of Buffalo Soil Conservation Area (Roneoed), Department of Agriculture, 1952.
7. Soil Conservation Scheme: Buffalo-Gulu Soil Conservation District (Roneoed), Department of Agriculture, no date.
8. Information from Extension Officer, Stutterheim.
9. Report of the Soil Conservation Board 1957-8, UG 27,1959.
10. A detailed account of communal tenure in a neighbouring district in the Ciskei can be found in The Keiskammahoek Rural Survey Vol.IV, Land Tenure by M.E.Elton Mills and Monica Wilson, Shuter & Shooter, 1952.
11. Summary of Report of the Commission on the Socio-Economic Development of the Bantu Areas of the Union of South Africa. UG 61, 1955.
12. Ibid, p.74.
13. Report of the Native Affairs Department, 1954-57. UG 14, 1959, p.56.
14. Proclamation No.116 of 1949.
15. Quotations from : Official Yearbook of the Union of South Africa, 1956-57, pp.366-375.

16. Economic Farming Units are explained in full in Chapter 3 of Economic Development in a Plural Society. They are, briefly, combined holdings of arable land and common grazing which are estimated to give the occupier an income of £60 per annum.
17. Proclamation 303 of 1957 is the basis of this step in the Betterment Programme. It effectively amended a reference in the original proclamation which allowed for consultation with the inhabitants. It is not clear whether it also refers to the substitution of 'explanation' for 'consultation' in stage 5 (as here outlined).
18. Mealie Control Act (No.39, 1931); Dairy Industry Control Act (No.35, 1930); Meat Trade Control Act (No.29,1932).
19. 28th Report of Imperial Economic Committee to Governments. Maize, London 1934.
20. Imperial Economic Committee, Grain Crops, London, 1939.
21. Future of Farming in South Africa. UG 10-'45, paragraph 20.
22. By Proclamation No.335 of 1939.
23. By Proclamation No.310 of 1948.
24. See Chapter 11 for a discussion of the origin of East London's milk supply.

Chapter 11

THE PATTERN OF LAND USE

As an integral part of the programme of the Border Regional Survey, a study of the land use of the two districts was made in 1955-6. The field survey then undertaken forms the basis of this chapter and the next. The results of the field survey are shown on the coloured Land Use Map accompanying this volume. This map shows the actual use to which the land was put in the 1955-6 season, and it is thus a snapshot of the Border Region at a point in time.

In the account of present land use that is set out in this chapter, the character and distribution of the various categories of land use distinguished on the map are described, together with an analysis using relevant data of vital interest in their interpretation. In Chapter 12 the broader aspects of interpretation are dealt with in relation to past land use and future prospects, and to the recognition of land use regions. Thus in the two chapters what might be called the personality of the two districts is examined, exposed to view, and explained.

The scale of the land use map (1:125,000) is such that, seen from a distance of 3 feet, it appears to the viewer as it would be observed from the air at a height of 72 miles above the surface of the earth. The classification and colours employed have been adopted in an attempt to reveal as clearly

as possible the main characteristics of the area portrayed by the map, whilst at the same time providing easily distinguishable categories into which the various uses of land have been grouped. The classification was derived directly from that suggested by the International Geographical Union¹. Consequently this map is comparable ^{with} to others using the same classification. The field sheets were on the scale of 1:18,000 for the most part, and although some generalization was necessary on reduction, this has been done in such a way as to preserve the main features and much detail of the pattern of land use.

There exist official statistics of land use, collected for the Agricultural Censuses. These have not been employed to any great extent in this volume, except to compare the present position with past periods. Some of the problems of using official land use statistics can be indicated. They are for whole magisterial districts, and it is by no means certain that they give a complete coverage of the whole land surface of the survey area. They are collected by individuals from farmers and officials who may be susceptible to making errors in the assessment of areas of crops, plantations and so forth. The record of the field survey of land use on a map is therefore a primary document of the greatest value. It is not however possible to dispense with statistics of livestock which cannot be accurately counted in the field.

The description of the land use pattern will proceed from class to class and will incorporate important questions of classification en passant.

VELD USED FOR GRAZING

The South African term veld is used advisedly in this context, as the grazing land in this part of the Union varies from pure grassland (grassveld) through grassland with increasing numbers of bushes or trees, to almost pure scrub². The forest proper is not often regularly used for livestock but occasionally provides browsing for goats. The distinctions between the types of vegetation and their distribution are more properly discussed in Chapter 5. In this category falls all land which is used predominantly as grazing land which has not been improved by fertilizing, re-seeding or other forms of cultivation. It may possibly have been camped³ and grazed in rotation. This category is still fairly close to being considered as natural vegetation in a scarcely modified form. Although over-grazing may alter the appearance and composition of the veld it can usually regenerate quickly to its original condition if spared long enough.

Veld used for grazing is the largest single category of land use in the survey area and is continuous within its limits. It provides the basis of the economy of most types of farming, and is seen in the land use map as a back-cloth on

PLATE 14



Upper Gonubie valley on Farm 301, east of Kei Road. Characteristic mixed veld with Acacia scrub and woodland (parkland type), and gully bush. Typically extensive pastoral country grazed by sheep and cattle together. February 1957.

which are superimposed man-made variations in the patterns of nature, and what is left of the indigenous forest. It constitutes roughly four-fifths of the total survey area.

Veld is dominant to the north-east of Berlin and Kei Road. Here it covers over 90 per cent of the total land surface. The lowest proportion, although still the most important single class of use, ^{occurs} in the lower Buffalo valley and to the south-west of East London. In these parts the unimproved grazing amounts to about half of the total area. The veld used for grazing rarely reaches the coast, but where it does and where it lies just behind the dune belt, it is said to be so enriched by salt-spray that livestock have little need of mineral licks.

Grazing land is characteristic of the extensive interfluves and plains along the major watersheds. In the Native reserves the veld is generally left, though heavily grazed, in its natural condition on the uplands and interfluves. In the valleys other types of land use compete for the available space. In the Pineapple Belt, south-west of East London, there tends to be less veld on the ridges, as these have been ploughed up for pineapples in recent years. The grazing is commonly on steeper valley sides and on valley floors and in other places less accessible from the roads.

Unimproved grazing is widespread enough for every farm and Bantu location to have some. Only in the mountain forests

of the north-west is the rural economy able to do without grazing. The variations in the amount of grazing preserved in the different areas ~~is~~ are closely connected with the type of farming being carried on. Discussion of these will be deferred to the next chapter.

It is well known that the palatability and nutritional characteristics of the veld vary considerably from place to place. A discussion of the distribution of the so-called sourveld and sweetveld is out of place here and more appropriate to Chapter 5. Suffice it is to say that in the neighbourhood of Amabele and Stockton the veld is considered sour, ~~that is~~ unpalatable in winter. Further south in lower country, it is locally considered that aspect plays a large part in determining the quality of pasture. For instance, it is held that northern and eastern slopes are favoured by livestock and are therefore better grazing^{3a}. Whether the botanical or chemical composition of the pasture varies in the same way is doubtful. Scientific investigation cannot yet define or explain these differences, but it seemed to one worker that "those grasses which are called 'sour' are the poorer ones, especially with regard to their protein and mineral content, but which often under the influence of high rainfall make up in bulk what they lack in quality".^{3b}

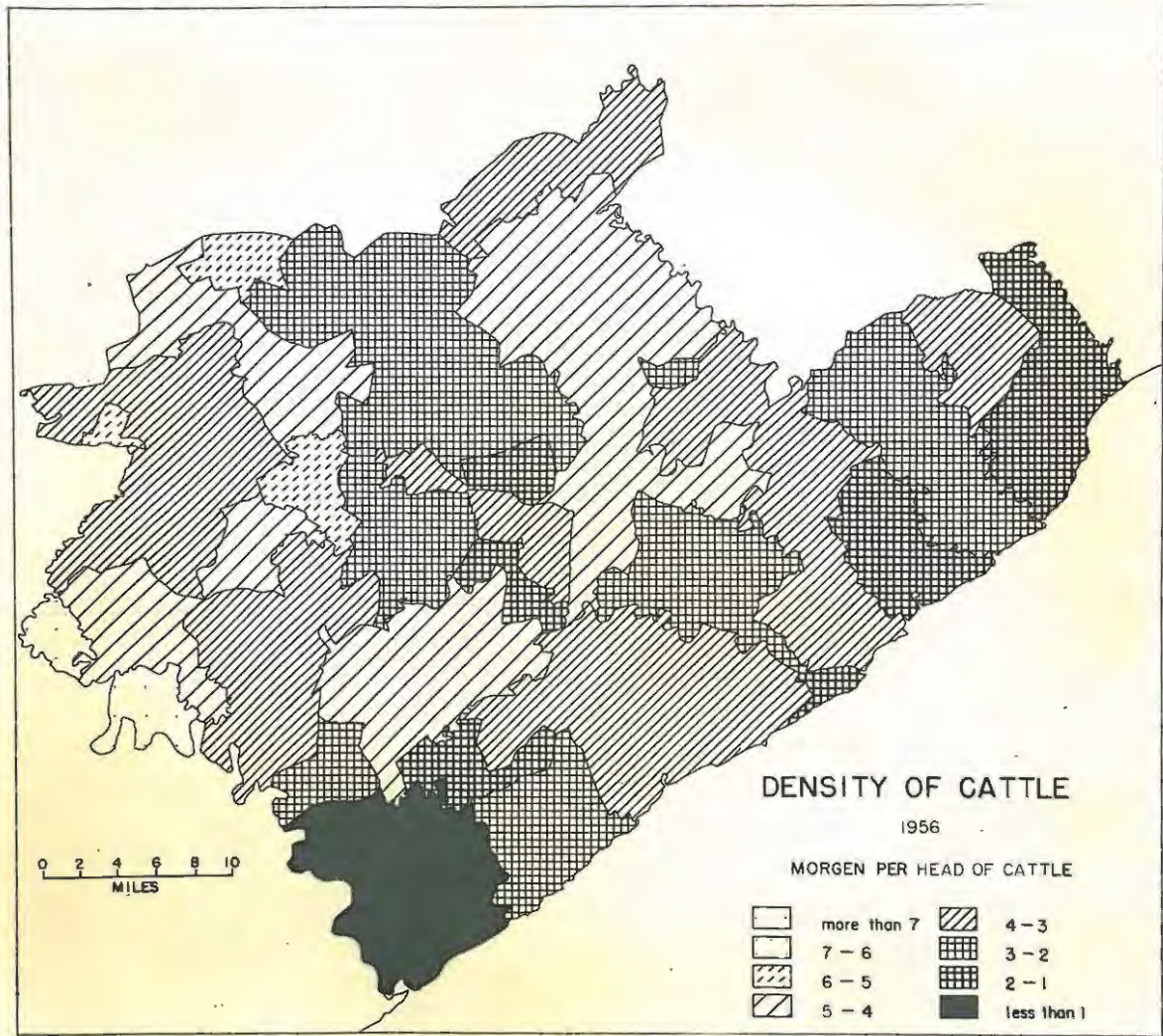
(i) The distribution of livestock

The livestock totals for the two districts were considered

as one aspect of investment in agriculture, in Chapter 3 of the companion volume Economic Development in a Plural Society. In this chapter it is possible, with the aid of more detailed statistics, to examine the distribution of certain classes of livestock within the region and to draw attention to some general relationships to land use regions and types of farming.

Cattle are the most widely-distributed farm animals and are found in every district⁴ in the survey area. No statistics of the age or sex of livestock were available and so this section depends on broad comparison between the main classes of livestock and the areas which they occupy. Where such areas include towns the urban areas have been included in the total areas, so that the densities portrayed on the maps might be expected to be considerably higher than they seem. The map of the density of cattle expressed as number of morgen (1 morgen = 2.11654 acres) per beast, shows the minimum overall density in each district. This may be interpreted as a rough guide to whether the district is overstocked with cattle or not. Since many farmers supplement veld grazing with feeding stuffs, higher stocking densities may be safely countenanced. This is not so for the majority of the Bantu areas, which provide little fodder for livestock. It must also be realised that in many districts there is a considerable proportion of forest which, in the main, is not grazing land.

MAP 19



The highest density of cattle is found in Released Area 33 at the Keiskamma River mouth. Grazing here has been controlled by the Native Affairs Department since the area was bought by the Trust⁵. With 317 cattle to the square mile this may well be the prototype for similar Bantu Reserves with a limited population and careful land use planning, such as that envisaged by the Tomlinson Commission.

The distribution of districts more heavily stocked with cattle reveals certain trends. First there are those parts adjoining Released Area 33 which provide grazing for livestock belonging to labourers on the local pineapple farms and to people normally resident in the Trust area to the west and south. Then there are the dairy farming areas - north of Berlin, East London West Bank, north of Fort Jackson and the district between the Nahoon and Gouubie Rivers. Higher densities are possible here because of the regularity of feeding in addition to veld grazing.

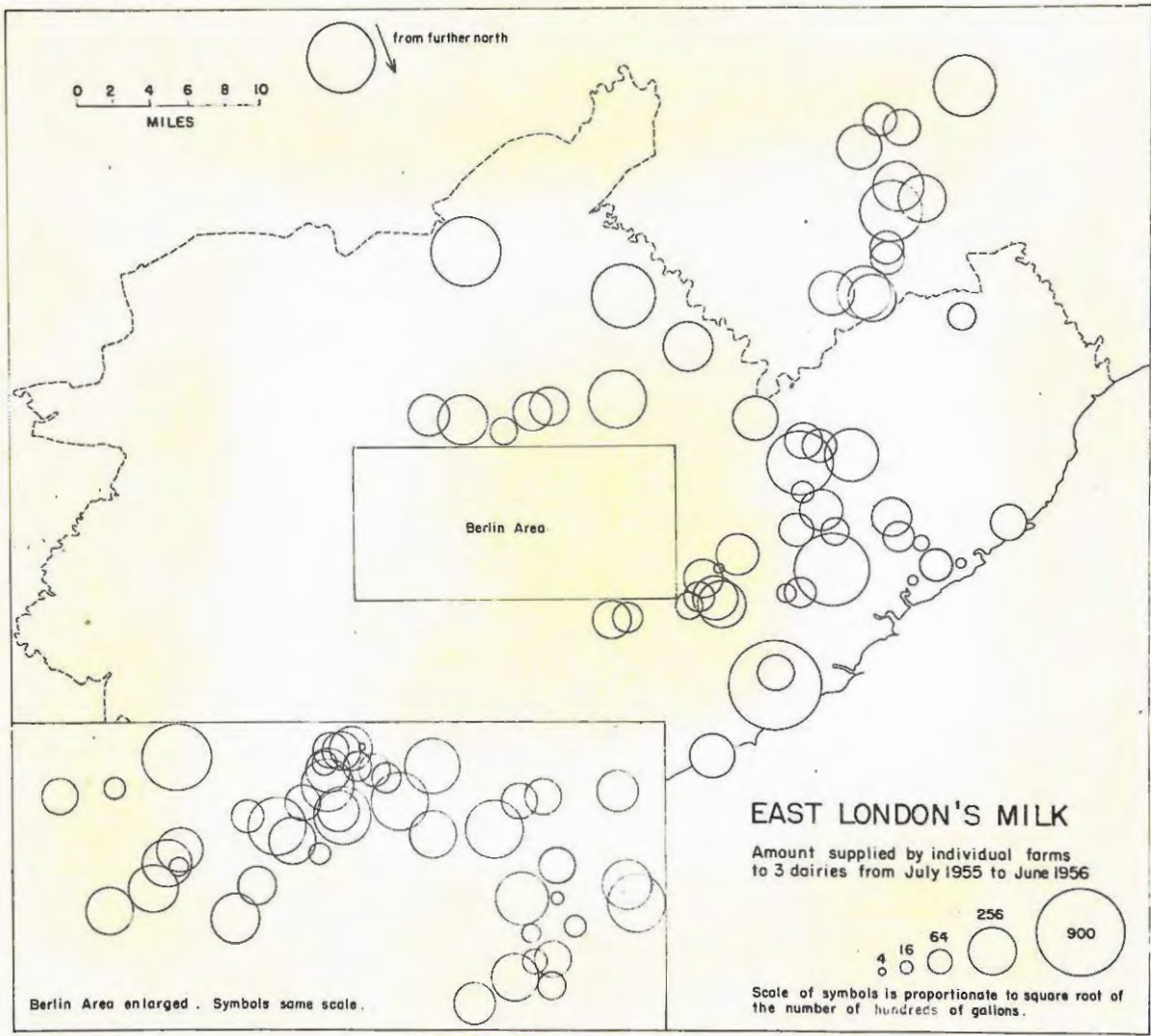
The association of high densities of cattle and milk production has been noted above. Map 20 shows the sources of East London's milk both from within and outside the Border Region. The records of three dairies, which together supply nearly the whole of the city's demand for fresh milk, provide a comprehensive picture of the relative importance of individual farms and districts contributing to this supply.

Some milk comes from further north, along the railway

line to Queenstown, but the bulk of the supply is related to the main roads of the region rather than to the railway. The Berlin area is probably the most important single contributor and is well served by road and rail. A line of farms along this double transport link with the city connects Berlin with the Wilsonia neighbourhood just outside East London. Another line of farms lies along the road (also tarred) between Macleantown and the city. An important group of farms in the upper Kwelera River valley, in the Komgha district just west of the National Road is near enough to supply East London with fresh milk daily. A small group lies south of the National Road, along the coast as far as the Kwelera River mouth. Another group of suppliers providing large amounts (20,000 gallons per year and over) lies well north of Berlin and away from the railway. Such concentration is facilitated by daily collections by lorries which go from farm to farm on regular routes.

Apart from three very important producers, the West Bank and Pineapple Belt do not provide East London with fresh milk. Dairy farming is generally incompatible with pineapple farming. The extreme east of the Border Region is generally too inaccessible to be able easily to send fresh milk regularly to town. The area around King William's Town chiefly supplies that town with milk and consequently East London has to draw supplies, not from there, but from further afield. Most of

MAP 20



the Kei Road area is devoted to other forms of pastoral farming and does only a little fresh milk production for households and not sufficient for marketing in the city. The regular supply of fresh milk requires considerable specialized capital - both in livestock and equipment and also much more regular attention to farming. Only farms nearer towns of medium size and with capital to develop such an enterprise can profitably undertake fresh milk production.

The large tract of the eastern end of the coastal district also has more than 100 cattle per square mile. There are, it is true, two Reserves here; but a considerable proportion of these cattle belong to Bantu on White farms. This area includes a number of Bantu-owned freehold farms carrying a total of 1316 cattle. These are regarded as overstocked by the Department of Agriculture.

Table 34

CATTLE IN DISTRICTS EAST OF GONUBIE

On farms of Whites

belonging to Whites	10,863	59.7	per cent
belonging to Bantu	6,027	33.1	" "

On farms of Bantu

1,316	7.2	"	"
-------	-----	---	---

Total	18,206	100.0	" "
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Source: Director of Veterinary Services.

In those districts adjoining Released Area 33 there are almost as many Bantu-owned cattle as White-owned cattle. But

although there are fewer cattle per square mile in the heart of the Pineapple Belt, the number of cattle belonging to Bantu exceeds that belonging to Whites by more than 50 percent.

The central part of the King William's Town district, along the Yellowwoods River and its tributaries, is an area with a greater density of cattle. Some, but by no means all of it, is Bantu land; and some is in small-sized farms with commonage grazing. It unfortunately coincides with a rather drier part of the region which makes it more susceptible to erosion once the veld has been overgrazed. One particularly heavily stocked area adjoins the Buffalo river below the Laing Dam. In general the Bantu area west of King William's Town has slightly less room for its cattle than has the White farming area of the King William's Town district. There are a few locations, however, which have more grazing area per head of cattle and thus approach the typical figures for much of the White area (4-5 morgen per head). Two tracts in the Keiskamma River valley attract attention as they have very few cattle. They are in what is considered to be one of the more ~~traditionally~~ conservative areas (Zalara, Qawukeni and Khalana). They are also heavily damaged by veld deterioration and erosion, so that it is most likely that the average number of livestock cannot be supported. It is well known that farms across the Keiskamma River, in the Peddie district, provide grazing from time to time for inhabitants of Khalana

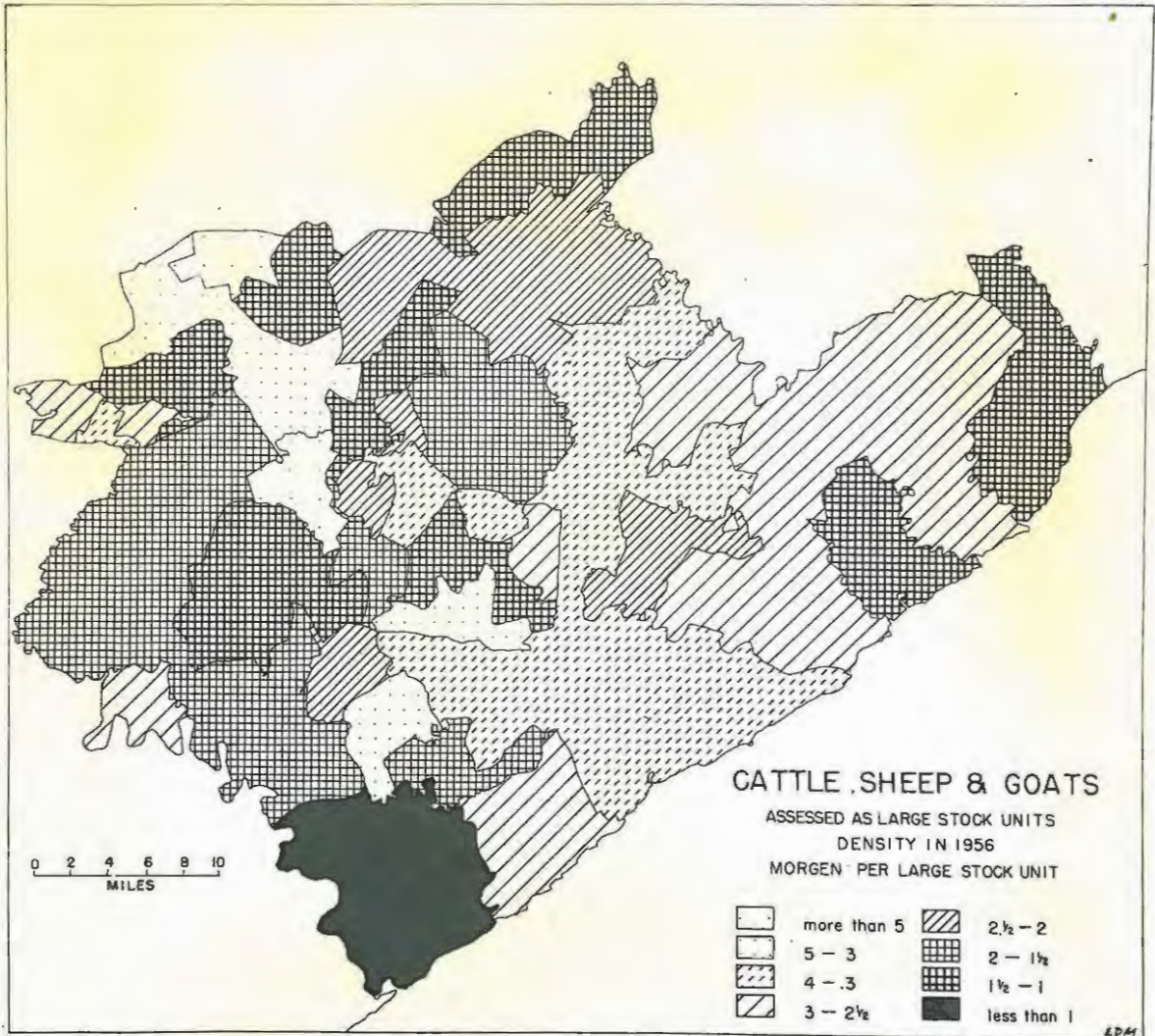
location. Cattle grazing **there** would be enumerated with those in the Peddie district.

Perhaps a more complete picture of the relationship between the available grazing and livestock may be obtained from map 21 which combines ~~the numbers of~~ cattle, sheep and goats. These are the main groups of livestock which count for much in both commercial and subsistence farming. The equine group is not very numerous, being significant only in a few locations. In order to reduce cattle, sheep and goats to the same units, cattle were considered to be single stock units and small stock one-fifth units. This assessment is based on their grazing capacity and is that used by the Department of Agriculture. The picture which emerges from the above map differs widely from the map of cattle density. Most of the Bantu areas are now distinguished by being heavily stocked at more than 150 units per square mile (less than 2 morgen per unit). There are exceptions to this as there are also exceptionally closely stocked districts in the White areas. Once again, in spite of there being no sheep or goats in the district, Released Area 33 is most densely stocked. But although many of the districts characterised by between 1 and 1½ morgen per unit are Bantu areas, they include the dairying areas between the Gonubie and Nahoon rivers, and the Kei Road district. The latter is mixed veld, well able to withstand a high rate of stocking, especially when sheep and cattle are

grazed together. It is, furthermore, an area where almost every farm has established pasture, and crops are rarely grown unless for fodder.

Almost all the scheduled locations and other Bantu areas come within this or the next lowest class - that is, they have between 1 and 2 morgen per unit. The locations immediately next to King William's Town are most heavily stocked. The contrast between the group of locations - Masele, Ngxwalane, Rhayi, Kwalini and Sheshegu, with 1068 units per square mile, and the King William's Town commonage with 283 units, is clearly visible in the landscape. Short and patchy sward is separated from the succulent scrub only by the line of a fence. Frequent contrasts of this sort are characteristic of the Border and have their roots in the chequerboard settlement pattern. More gradual transitions between coastal climate and vegetation and inland conditions are accompanied by broad changes in the composition of the livestock population. In general the coastal district has more cultivation and fewer livestock. Animal diseases⁶ are more prevalent there in the warmer and more equable climate. The inland district is more properly a pastoral one and has less cultivation. The types of livestock are also more varied, cattle sometimes taking second place.

MAP 21



(ii) Proportions of different kinds of livestock

It is of course possible to compare the distribution of any group of livestock with another, donkeys with cattle for instance. It has been thought valuable to compare, first, cattle with sheep, and then goats with sheep. Two maps drawn up on a basis of the ratio of sheep to cattle and sheep to goats show the relative dominance of cattle and goats vis à vis sheep. Since goats are nearly always a farming side-line except in the Bantu areas, the varying relationship between cattle and sheep (map 22) is closely associated with variations in types of White farming.

Sheep are unimportant in the coastal district and are entirely absent from several districts - notably Released Area 33 and the Mooiplaats-Van der Kemp's location region in the east. Cattle are more than 512 times as 'numerous' as sheep in the districts around East London. But on the higher ground towards Macleantown cattle are less dominant (14.5 times as 'numerous') because of the increasing importance of livestock farming and of speculating with cattle and sheep. The main dairy farming areas thus emerge as cattle-dominant, while ⁱⁿ the largely non-dairying pastoral area between Berlin and Kei Road neither sheep nor cattle dominate to any great degree. Throughout much of the Bantu area west of King William's Town sheep predominate over cattle. This is an interesting stage of affairs since a century ago the Bantu kept no sheep here. It

is noticeable too that the higher ground away from the deeply-cut valleys of the Keiskamma system is 2-4 times as sheep-dominant as the locations in the valley. This pattern is similar to the broad regional differentiation in the White areas. It is suggested that the ijojo⁷ or sourveld grazing is considered more suitable for sheep than the isandle⁷ or sweeter veld in the valleys. Certainly the plateau or upland veld is healthier and has a higher carrying capacity in the growing season.

The German settlements around King William's Town tend to be more cattle-dominant than adjacent Bantu areas. This is related to a greater degree of control over the number of livestock grazing there and the greater risk in running sheep on open commonage and near Bantu areas. The White farmers of the area do not kraal their livestock as the Bantu do every night. It is said that thefts and cold snaps are the biggest deterrents to sheep-farming.

When the number of goats is compared with the number of sheep, two main relationships emerge. Where sheep are least numerous, as in the coastal districts, goats predominate. The mixed farming areas north-east of East London are more goat-dominant than most other districts. It is significant however that most of the goats there are kept by Bantu either on White farms or in Reserves. East of the Nahoon river⁸ there are 10,439 goats owned by Bantu and 689 owned by Whites.

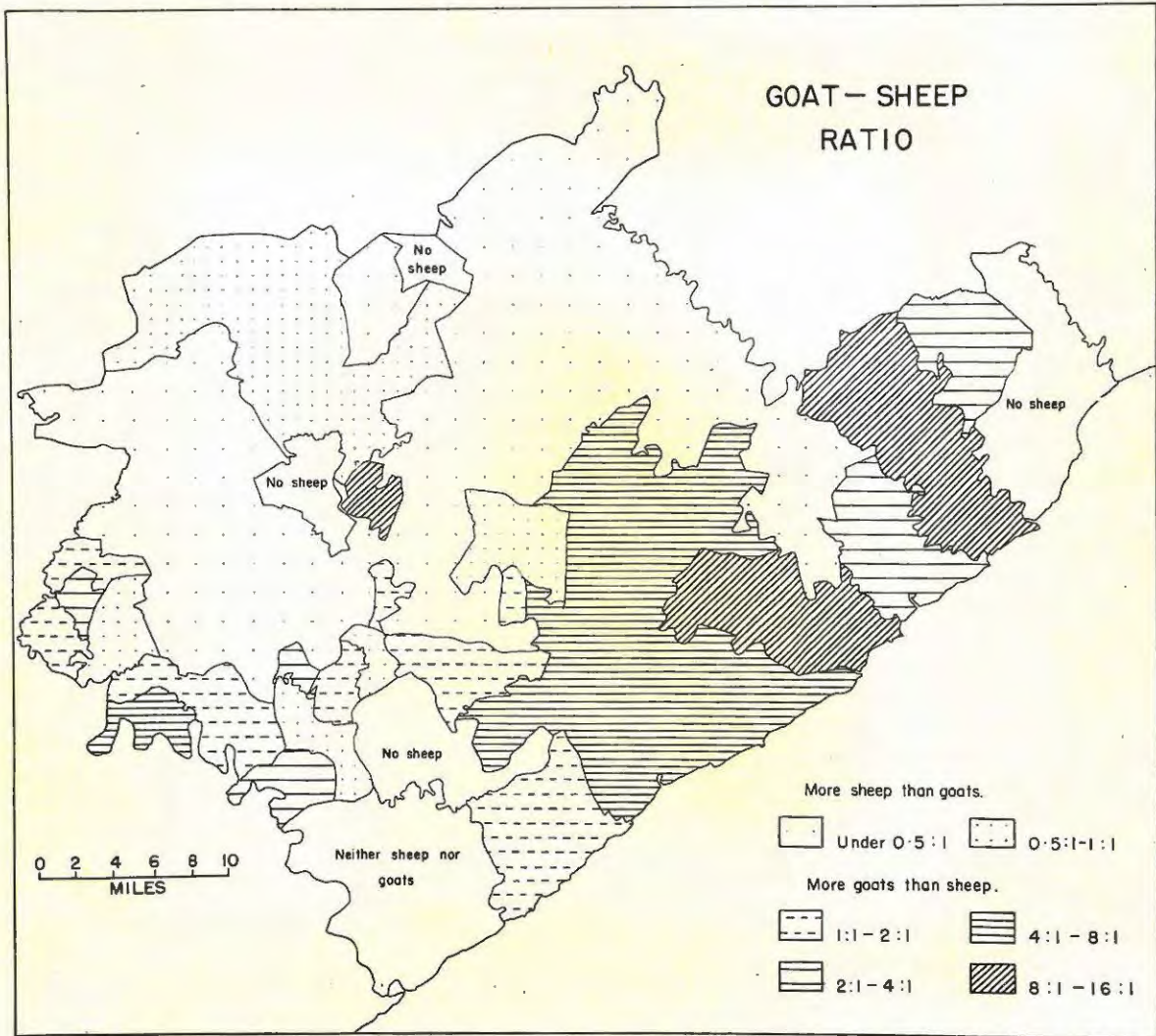


PLATE 15



A herd of Bantu-owned goats browsing in Acacia scrub.
Qongota Location, looking south-east towards Fort Murray.
January 1956.

Inland the vast bulk of the area of White farms and much of the higher, better grassed Bantu area, have more sheep than goats. (Goats are excluded from Trust property as a rule.) But in the lower-lying, sweet-veld districts of the middle Buffalo and Keiskamma valleys there are many locations where goats are more numerous than sheep. It is considered that they are largely responsible for the greater deterioration of grazing in these areas. At Breidbach, for instance, goats have increased at the expense of sheep as a small stock enterprise - there are 14 goats for each sheep now. In 1875 there were probably 30 sheep for each goat. In the same period the number of cattle has increased probably ten-fold⁹.

(iii) Equines

Horses are rarely used for draught purposes. They are often the chief means of faster travel for the rural Bantu, and are thus widely spread throughout the Native area. There are fewer horses on White farms.

Donkeys, and, less frequently, mules are chiefly employed as draught animals. There are a number of locations which have over 100 donkeys. High figures like these possibly reflect only the chance residence there of a man with a little capital who performs a carrying service for the local inhabitants. Donkeys have commonly replaced oxen as draught animals for transporting goods, but they have not made any impression on the importance of the ox for ploughing.

(iv) Livestock diseases

Besides the endemic diseases which affect domestic animals in the Border area there have been in the past severe outbreaks of other diseases, namely lung-sickness in the 1850's, rinderpest in the 1890's and East Coast Fever in 1912-14. There is still a danger that the latter disease might occur in the area again and so both districts are scheduled as East Coast Fever districts. This means that cattle must be dipped every 14 days in winter and every 7 in summer. Livestock may not be moved from farm to farm without a permit, and similar restrictions apply to the reserves.

The number of livestock recorded as being lost through disease in the Native Reserves is usually lower in relation to the total numbers grazing there. This may well be due to the fact that many more animals die because of the periodic droughts, which affect the Reserves more seriously. On farms, even in a year of severe drought, such as 1949-50, the number dying from disease was roughly equal to, if not more than, the number dying because of the drought. In normal years losses through disease are greater than deaths from other causes.

Table 35

LIVESTOCK LOSSES SEPTEMBER 1949 - AUGUST 1950

Causes:	<u>Farms of Whites</u>			<u>Natives on Reserves</u>			<u>All areas</u>
	<u>Disease</u>	<u>Drought</u>	<u>All</u>	<u>Disease</u>	<u>Drought</u>	<u>All</u>	<u>All</u>
<u>Cattle</u>							
E.L.	2,096	1,871	4,272	715	1,420	2,135	8,109
K.W.T.	1,285	1,849	3,225	629	15,299	16,018	19,982
<u>Sheep & goats</u>							
E.L.	805	296	1,339	329	297	637	2,706
K.W.T.	4,394	3,129	8,908	833	31,025	32,784	41,867

Source: Agricultural Census No.24, 1949-50.
Spec.Report Series No.14¹⁰.

Many livestock diseases are spread by ticks. It appears that the activities of ticks increase markedly in the warmer weather of summer. Tick infestation is not so serious in the cooler climate of the Western Cape Province. But in the Eastern Cape Province the warmer valleys, like the Great Kei, and the Keiskamma to a lesser extent, are more favourable to ticks. Animal diseases carried by ticks are more prevalent in the summer months and in the larger river valleys. The seasonal incidence of redwater, gall sickness and Koch's bodies bears this out. The peak occurrence of redwater is roughly a month earlier than that for gall sickness, which has a longer incubation period. Between two-fifths and a half of the cases of redwater were diagnosed in February, March and

April. Except in the Kei Road area, over a third of the gall sickness cases were recorded in March, April and May, some two months after the start of hot weather. (The sample studied is too small for one to be able to draw any conclusions from the Kei Road figures.) Discovery of Koch's bodies was again mainly made in the months of February March and April, but they now rarely develop into East Coast Fever.

Both cattle and sheep suffer from heart water (also tick-borne). Sheep are additionally susceptible to pulpy kidney and bluetongue, against which there are effective vaccines now in general use. It is also necessary to dose sheep to protect them from verminosis.

Sheep have not done well in the coastal districts since the early 1870's. In 1875 it was noted that formerly sheep and young stock could be grazed there, but since then only cattle. It was noticed that there had been a change in the veld, for instance. The Civil Commissioner's report for 1875¹¹ mentions the increase of burr-weed in the Crown Lands east of the Gonubie, probably owing to selective grazing. Whereas some 70,000 sheep had been grazed in Released Area 33 (then Ward 1), there was none in 1875¹². Farmers who brought sheep down to the coast for winter grazing found that their stock suffered high mortality. Sheep might well have suffered, as they do now, from bluetongue, heartwater and verminosis. Scab was seldom reported in the East London

Table 36

INCIDENCE OF CERTAIN DISEASES - SMEAR RECORD. 1950/1 - 1957/8

	<u>Districts</u>	<u>J</u>	<u>A</u>	<u>S</u>	<u>O</u>	<u>N</u>	<u>D</u>	<u>J</u>	<u>F</u>	<u>M</u>	<u>A</u>	<u>M</u>	<u>J</u>	<u>Total</u>
	E.L.	24	14	12	15	19	11	31	48	85	45	25	21	350
REDWATER	K.W.T.	23	16	4	10	9	18	22	44	84	66	74	21	391
	K.R.	6	7	4	1	0	2	3	9	10	8	9	7	66
	E.L.	30	24	25	15	14	10	30	16	50	33	27	21	295
GALL SICKNESS	K.W.T.	14	13	15	3	4	5	10	17	21	8	25	18	153
	K.R.	4	3	2	3	1	1	1	0	1	1	0	3	20
	E.L.	0	1	1	0	1	2	1	7	8	1	1	6	29
KOCH'S BODIES	K.W.T.	0	1	1	0	2	0	0	6	7	1	1	1	20
	K.R.	0	0	0	0	0	0	0	0	0	0	0	0	0

Total of smears examined: 12,437

Source: Annual Report State Veterinarians, King William's Town and East London (unpublished). K.R. stands for Kei Road.

division but it was suggested that it was more prevalent in adjoining areas. The midge which carries the bluetongue virus is driven away by the first frosts of winter. This might help to explain the greater success of sheep-farming on the higher ground inland. Greater tick infestation on the coast and the lack of the immunity possessed by older cattle may have been responsible for losses among young stock. It was averred that the unsuitability of the area for stock had spread eastwards from Ward 1, the oldest settled area. "The gradual unfitness for sheep is creeping eastwards, for there again upon the Crown Lands which formerly supported numerous flocks, and were the salvation of thousands of sheep from the upper districts in winter months, the mortality among sheep is increasing year by year, and was during the last year very severe indeed."¹³

The blue tick which is a vector of redwater and gall sickness had, prior to 1946, developed a resistance to arsenical dip in the East London area, but by that year it had been found to succumb to the new Gammexane emulsion. The latest method of dealing with blue ticks which are resistant to both ~~these dips~~ and also to benzene hexachloride is to immunize the cattle by inoculation. Owing to the prevalence of droughts, dipping has sometimes to be suspended in summer. Blue ticks in particular were noticed to have increased in the 1955-6 season, a year of drought.

There is an important disease which is associated with phosphorus deficiency in the diet of domestic livestock. The pastures in the Borderland are recognized to be deficient in phosphate and protein, especially in the winter months¹⁴. Henrici established that it was not only the inland, sourveld pasture which had this character, but also the veld nearer the coast in the East London district. Cattle in particular, when deprived of these mineral nutrients and green feed often suffer from aphosphorosis. In this condition, if they attempt to satisfy their craving for these nutrients by chewing old bones and carrion, they frequently contract botulism or lamsiekte from a toxin produced in the carcasses of the dead animals by the bacillus Clostridium botulinum. Cattle may be inoculated against this, but must be supplied with phosphates or bone meal to counteract the phosphorus deficiency. The greater shortage of green feed and grazing within the Bantu areas in winter, coupled with the high stocking rate there, is a major factor resulting in the poor condition of much of the livestock in the Reserves.

This is not an appropriate place to catalogue all the livestock diseases affecting the survey area¹⁵. Such information is of little value unless compared with the situation throughout the country. Where significant variations of the incidence of diseases within the area occur, they have been mentioned.

VELD NOT USED FOR GRAZING

This category of land use is but poorly represented in the survey area. The region has been occupied for probably three centuries by pastoralists (first Hottentots and Bantu tribes and then White settlers) and as a result there is almost certainly no veld which has not been grazed at some time. The only portions which were not grazed in 1955-6 were specially reserved and enclosed. Most of this area lies within the Crown Forests in the Amatola Mountains and in the Forests of the Buffalo Valley. The glades in the forests are not all protected from the effects of grazing, as the employees of the Forestry Department are allowed to pasture a few livestock on some of them. In the others there is a possibility of fynbos encroaching rapidly ^{when not grazed,} unless it is checked by fire.¹⁶ A small area of grazing near the Chalumna River mouth was not used as it had been fenced off to prevent further soil erosion there.

ARABLE LAND

Included in arable land are all areas under field crops which are not perennial. Both pineapples and lucerne were considered to be field crops of less than perennial status, although they occupy the ground for more than one season. Fallow land was in all cases treated as arable land, except when it was clear that it would not be cultivated again (because of erosion for instance). Some arable land is

irrigated. But since it is now possible by means of portable contrivances to irrigate several lands with the same equipment at different times, it is impossible to tell by inspection alone whether land is irrigated or not. Very little of the arable land under field crops is irrigated. More details are given in the next chapter on the importance of irrigation. Although on the topographical maps established pastures are shown as arable land, in conformity with South African usage they have been classified separately.

Arable land is by no means uniformly spread or equally apportioned between the different regions of the survey area. It is possible, with the aid of the map of arable land (opposite p. 221) to recognize several well defined patterns which are usually indicators of different types of farming. Cropland is the second most important category of land use. It covers the largest extent in the Pineapple Belt (40 per cent of total area) and occupies only about 6 per cent of the area east of Kei Road.

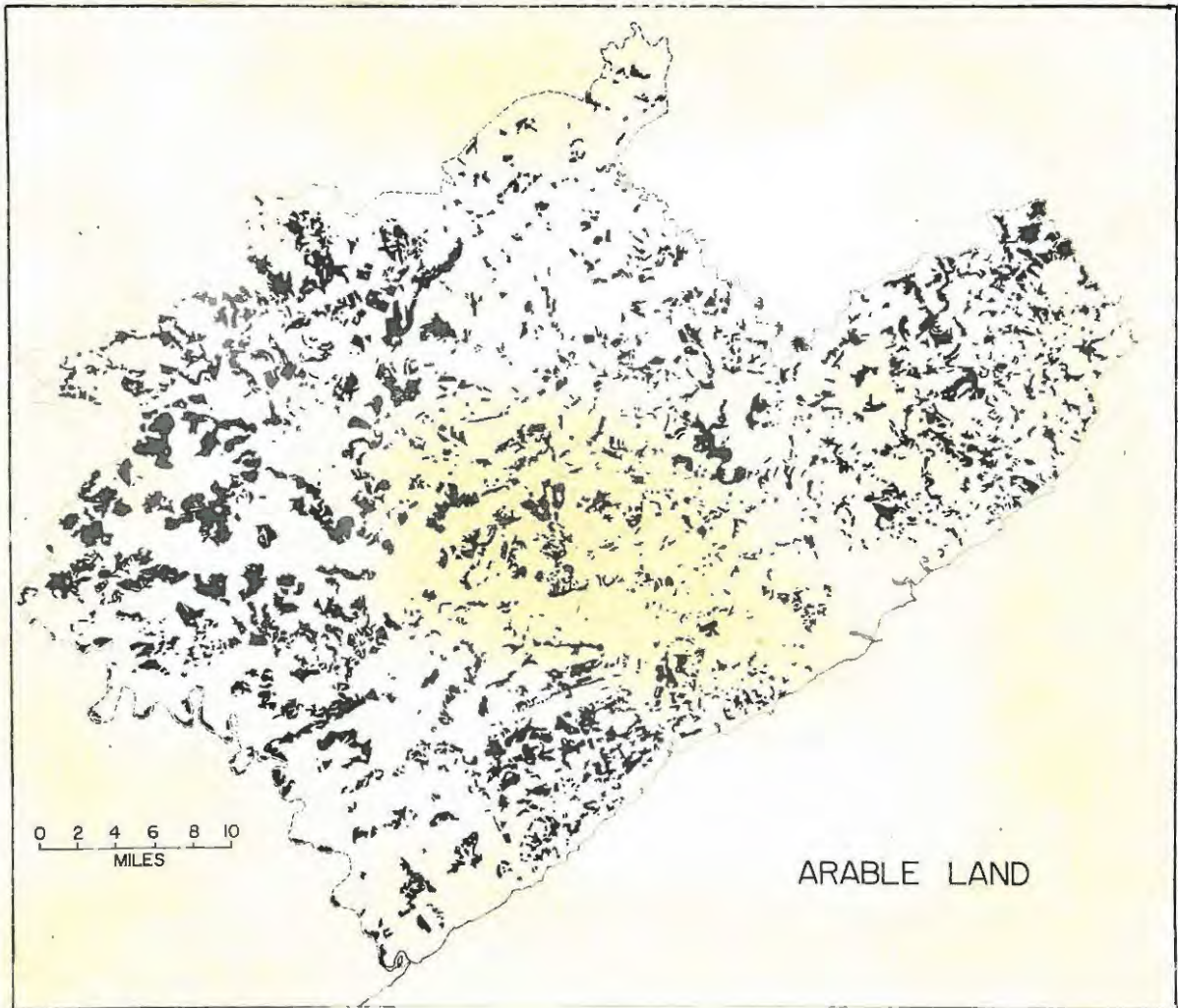
The manner in which arable land is concentrated is very characteristic of different types of economy and tenurial conditions. This fact in turn affects the lay-out of the grazing land and may have further repercussions on conservation practices. In the west of King William's Town district the cropland is usually in large irregular blocks. One or two of these irregular blocks may include all the arable land

belonging to one Bantu location. This is a natural outcome of the persistent dominance of a pastoral economy which places a premium on grazing rather than on arable land. Arable land is consequently restricted in area and in its spread throughout the location, leaving free wide expanses of hitherto unfenced veld.

The smaller units of cropland with roughly rectangular outline are typical of the mixed farming areas of White colonization. The distribution of cropland in the Pineapple Belt however appears differently, as there has been extensive cultivation within smaller farm units and this pattern, encouraged by high prices, has led to near mono-culture of pineapples. Beyond, in the extreme south-west of the survey area, are arable blocks of limited extent which possess a similar degree of concentration to those in the Bantu Reserves to the north of them. These are the product of land use planning in an area (Released Area 33) bought for Bantu occupation.

It is not possible to assess exactly the extent to which the area under cultivation has increased since agricultural peoples entered the area. At first there could have been little cultivation by the Bantu tribes. The Reverend J. Adamson, in evidence before a Select Committee of the House of Commons in 1851, stated that "They (the Kaffirs) cultivate rather by what may be termed garden culture; they raise

MAP 24



millet, which is the grain of Africa, and pumpkins the abundance of which is a peculiar characteristic of the climate also; lately they have introduced maize to a considerable extent".¹⁸ The first land use statistics are given in the Cape Colony's census for 1875. Although the two districts now cover a very much smaller area than they did in 1875 it is clear that the extent of cultivation has increased absolutely and in proportion to the total area in the last eighty years.

Table 37

CHANGES IN AREA CULTIVATED: BORDER REGION

	<u>East London</u>		<u>King William's Town</u>	
	<u>1875</u>	<u>1955</u>	<u>1875</u>	<u>1955</u>
Total area (acres)	784,051	440,990	1,139,913	546,596
Total extent cultivated by Whites	2,889	34,521	514	30,286
Total extent cultivated by Bantu	4,589	21,659	49,506	87,007

Sources: G42-'76 (Cape), UG 49/58 (Union)

There are, for the most recent period, more reliable statistics based on the same district areas which obtain today. They are discussed below.

Changes in Crops and Land Use

The four complete agricultural censuses held between 1937 and 1955 provide statistical data which enable the

changing importance of certain crops to be expressed quantitatively. All agricultural and field crops were considered together and grouped into nine classes with an additional miscellaneous class for crops not specified in published returns.

The total area under agricultural crops in the East London district has increased at each census since 1937, but the biggest single increase occurred between 1946 and 1950 - some 1,320 acres. Not all of this or other increases is due to cropping virgin land or fallow; some may be due to an increased utilization of existing cropland. In the King William's Town district the area of agricultural crops has declined since 1937, with the exception of the 1950 season. It seems that the winter cereal crop failed after it was planted and that some of the land was then used for maize. This would account for an increased percentage of maize at the same time as a smaller percentage of winter cereals. Maize is the most extensively grown crop in both districts. In the East London district its acreage has however declined proportionately and absolutely from the 1937 level. In the coastal district the area under pineapples had by 1955 exceeded the area of maize by 106 acres. Maize appears to have held its position in the King William's Town district. The tendency for there to be only two dominant crops in the coastal district is no longer the case in the inland district.

The diversified crop pattern of 1937 in the East London area has changed to one where maize and pineapples are pre-eminent. The proportions and even the absolute acreages for other crops has gradually declined. This does not however apply to chicory, a crop new to the district in 1950. In the King William's Town district cereals account for more than 80 per cent of all crops at each census. Some alterations in the importance of minor crops has taken place. The constituents of "other crops" probably included a fair proportion of roots in 1937. These have given way to an increased acreage of hay and fodder crops and an associated increase in artificial, established pastures. Pineapples were on the increase in the south-west of the district in 1957. Pulses on the other hand have declined in acreage both relatively and absolutely.

Vegetables warrant greater attention, primarily because of their general importance to the economy of the Border and secondly because of complications involving classification. The agricultural censuses have conventionally separated onions, potatoes and sweet potatoes from "other vegetables" in their enumerations. This distinction is also made here. In the East London district, which has long grown produce for the substantial urban market, the acreage of other vegetables exceeds that of the "field vegetables" by 3 or 4 times. In the inland district, which has no special advantages of

Table 38

AGRICULTURAL CROPS ON FARMS OF WHITES

(Areas expressed as percentages of total)

	<u>East London</u>				<u>King William's Town</u>			
	<u>1937</u>	<u>1946</u>	<u>1950</u>	<u>1955</u>	<u>1937</u>	<u>1946</u>	<u>1950</u>	<u>1955</u>
Summer cereals	75.2	69.6	65.0	45.7	61.9	64.6	70.3	66.3
Winter cereals	8.8	5.4	4.8	3.1	19.4	18.7	14.1	16.3
Pineapples	4.5	12.5	16.5	45.2	--	-	0.2	3.5
Field vegetable crops	2.9	5.3	4.2	2.4	3.0	2.3	1.4	2.5
Pulses	3.9	4.0	2.0	0.6	7.7	8.6	4.7	4.1
Hay and fodder crops	1.8	2.6	3.6	1.4	2.9	5.1	8.2	5.9
Industrial crops	0.1	0.1	0.5	0.1	--	--	--	-
Chicory	-	-	0.8	0.8	-	-	-	-
Oilseeds	0.1	0.1	0.8	--	0.2	0.2	0.1	--
Other crops	0.7	0.4	1.8	0.7	4.9	0.9	0.8	1.3
TOTAL (per cent)	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
TOTAL (Acres)	25,494	25,843	27,162	27,191	17,798	17,129	18,854	16,776

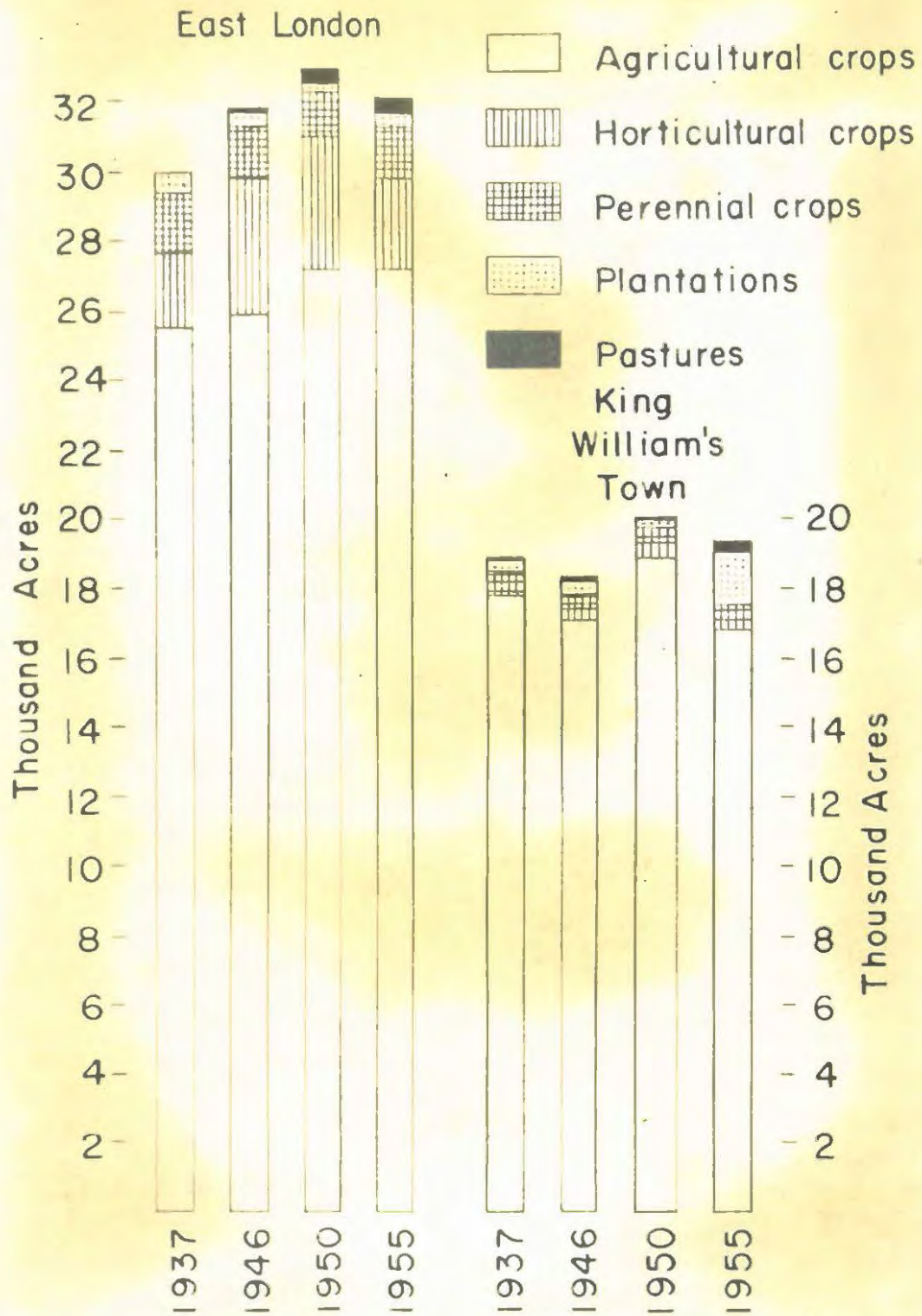
Source: Agricultural Census.¹⁷

- = none

-- = negligible.

FIGURE 10

IMPROVED LAND ON FARMS OF WHITES 1937-55



climate or accessibility for growing market produce for East London, the proportions are reversed. The acreage of the less perishable field vegetables has usually exceeded that of the other more perishable vegetables. It is noteworthy that the actual acreage under "other vegetables" in the East London district has declined since 1946, presumably because of the increasing profitability (in those years) of growing pineapples. Sweet potatoes are a speciality of the Mooiplaats area in the East London district, but the inland district is generally too cool for them and there they are quite unimportant.

Table 39

VEGETABLE ACREAGE - FARMS OF WHITES

	<u>East London</u>				<u>King William's Town</u>			
	<u>1937</u>	<u>1946</u>	<u>1950</u>	<u>1955</u>	<u>1937</u>	<u>1946</u>	<u>1950</u>	<u>1955</u>
Field vegetables	751	1,367	1,147	636	521	658	258	419
Other vegetables	2,114	3,952	3,528	2,436	110	262	432	281

Source: Agricultural Censuses.

From the analysis of changing crop acreages it can be said that a difference in farming type is gradually emerging. Before 1937 the coastal district had merely experimented with specialized crops. The mainstay of both regions was maize and to a very much less extent winter cereals, partly for feeding off and partly for hay. A pastoral farming economy

dominated the scene. With the growing of the urban market at East London and with increased possibilities within the Union and also abroad for marketing fruit, the East London district has slowly developed as one of the leading sub-tropical and vegetable-producing areas in the Eastern Cape.

The situation between 1937 and 1955 is summarized in the diagram opposite p. 226. The acreage under agricultural crops and the area of orchards have tended to decrease in the King William's Town district. The contracting acreage of orchards in the East London district is probably due to the competition from producing areas better placed to supply fruit to the city all the year round. It is mostly fruit for export (such as citrus varieties) and for processing (guavas) that has managed to hold its position in the survey area. Agricultural crops in the coastal district were on the increase. The conversion of much virgin veld to arable land for pineapples is responsible for much of this. Established pastures are a class of land use that has emerged with the improvement of farming techniques. There is now a significant proportion of the land in this category, whereas in 1937 it was negligible. Timber plantations have been expanded considerably in the inland district on the wetter flanks of the mountains. This represents the exploitation of a natural advantage which the inland district has over its neighbour.

HORTICULTURE

There are very few areas devoted to horticulture large enough to be shown on the land use map. In this class of land use are included nurseries and large gardens devoted exclusively to the cultivation of vegetables for market. There are many other instances of vegetables and other market garden crops being grown in rotation with field crops. These have been considered as field crops and are not separately shown on the land use map.

Horticultural use of land is virtually limited through the attraction of the markets to the proximity of the two main towns. Other farms practising occasional horticulture are forced by their greater distance from the markets to widen the range of crops grown to include potatoes, beans and cereals. A few small patches of horticulture occur in the surveyed locations of the Bantu areas. They have been specially designed as "garden lots" and are generally better kept, weeded and manured more often than the outlying lands. Gardens of similar kind also occur in the unsurveyed, scheduled locations; but they are generally too small to be shown at a scale of 1:125,000. They have been omitted from the coloured map except when such areas have been specially set aside by betterment schemes as in Bulembu Location.

ORCHARDS

The category "orchards" includes the four main types of

tree fruits - citrus, deciduous, sub-tropical and nut, as well as certain other perennial crops such as bananas, paw-paws and small fruit.

Most farms in the Border area have a small orchard, often near the homestead. These are usually too small to warrant their being distinguished on the land use map. More interest is attached, however, to the larger orchards the produce of which enters commerce far more. These larger orchards are frequently in areas where there is a concentration of orchards and there is consequently a degree of regional specialization - whether it be in citrus fruits or in guavas, which are the two most common orchard fruits. There are two areas, both near the coast, in which there is more than the average area under orchards. One of these, near Christmas Rock, specializes in guavas on an area of sandy soils. The other, south-east of the main road between Lilyfontein and Mooiplaats, also has guavas but a greater number of bananas, paw-paws and more tropical fruits such as mangoes and litchis. The latter groups is found most commonly in sheltered nooks or in the flatter margins of estuaries, particularly Cefani and Kwenzura. But there are also important citrus groves in the Buffalo, Nahoon and Keiskamma valleys. In these areas the orchards are more important to the economy of the individual farms in which they lie, than important in the sense of covering a large extent of the region. Citrus trees

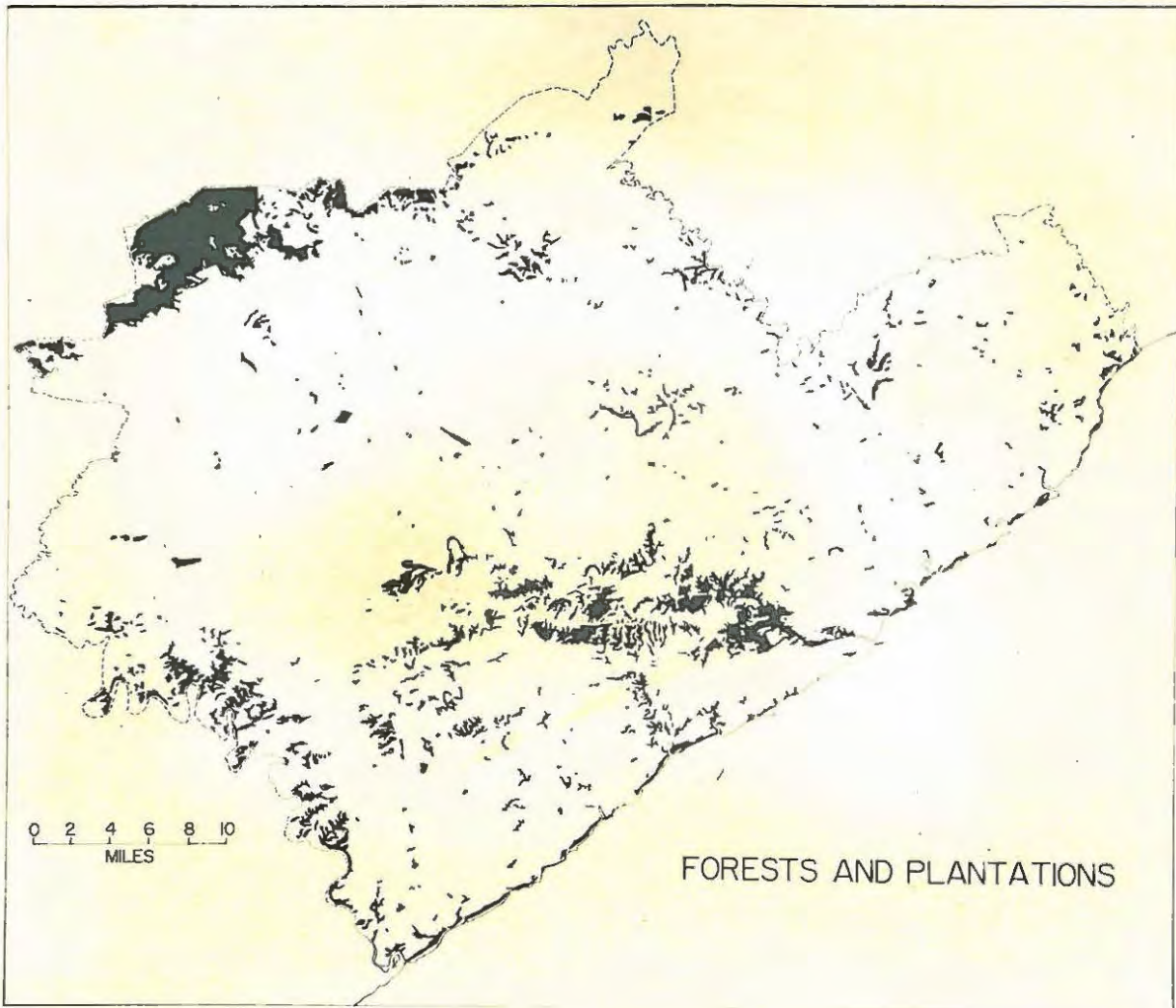
in production give a very much higher return per acre than any other type of land use. Their significance is therefore very much greater than would be suggested by a map of land use, based on the areas devoted to different crops.

FORESTS AND PLANTATIONS

All the woodland in the two districts has been mapped in this category. Most of it is high forest, or potential high forest (when newly planted). There is one main concentration, in the Amatole mountains where the woodland covers nearly all of the land surface. This is largely indigenous forest¹⁹ and of little commercial value, as much of it is highly inaccessible. Before the advent of modern forestry practices in the 1880's the indigenous forest was exploited for various kinds of timber, for building, fencing and firewood. Where the forest was felled, or where it was thinner than elsewhere, plantations of species of Eucalyptus and Pinus have been established by the Forestry Department and their predecessors²⁰.

The other forested regions are not so continuously wooded as the slopes of the Pirie Mountains. The largest of these lies in the middle and lower Buffalo valley between Mount Coke and East London. There are two Government Forests in this tract so that with their plantations of exotic trees they both give rise to local concentrations of woodland. Elsewhere in this area gully bush is generally found in the steep kloofs

MAP 25



FORESTS AND PLANTATIONS

PLATE 16



Boundary between Farm 129 and Peelton Location, looking south. Acacia scrub increasing on farm occupied by a White farmer, but Acacia scrub almost absent from the Bantu area. On the distant hill, as in the foreground, there is a noticeable difference between the grass cover of the two areas. February 1957.

leading down to the Buffalo river. Occasionally the inter-fluves as well are clothed with woodland, where soil and water conditions are favourable and where they have been protected from exploitation for timber and firewood. Even where there is little true forest remaining between the strips of gully bush, the scrub is thick and often occurs in clumps or thickets. Although farmers and agricultural officials consider that the bush is encroaching on the grazing in this area there is little evidence to suggest that this is anything more than the forest reasserting itself on its margins. Here possibly overgrazing, following earlier bush clearing and tree felling, has lowered the resistance of the grassland to invasion by forest species. It is not the place of this account to attempt a full explanation of the origin and persistence of an extensive forested tract in this area, but two possible factors should be borne in mind: First, much of the ridge on whose slopes the forest lies is underlain by dolerite and this is coupled with a locally heavier rainfall. Second, the steepness and sharp relief of much of the tract has helped to make much of it inaccessible to would-be improvers and exploiters.

Throughout most of the area occupied by the farms of Whites there is some small amount of woodland - mostly indigenous. Much of it has been exploited in the past century of settlement and is now almost valueless, except to bind the soil of the steeper parts. It lies chiefly in the kloofs and on wetter slopes. There are one or two parts where forest is more common. These have been given sub-region status within the framework of land use regions. They are usually areas where for one reason or another the forest has remained relatively free from exploitation and clearance. Inaccessibility of the timber resources is a major factor in their survival.

Most of the Bantu areas are short of woodland. It is only in a few favoured places that there is any appreciable extent of forest. The main area is in the Keiskamma valley, where the forest, although much cut over, provides firewood for neighbouring locations. The Tamacha forest in Nonibe location, and smaller remnants of forest at the heads of neighbouring valleys to the west, may well be partly nourished by the frequent mists occurring on the southern side of the Tamara Heights. These tracts of forest are preserved from exploitative utilization in the traditional manner and are the most extensive to be found in the Bantu areas. There is considerable local evidence for the extensive clearing of valley forest in the Bantu areas. This is particularly noticeable at the margins of the Reserves, where forest is still extant on the adjoining farms.²¹ Only an occasional Msenge (Cussonia spicata), Euphorbia, or wild olive bears witness to what was there before.

The Berlin Flats, north and east of Berlin and Blaney, are devoid of forest. There are however several recently established plantations, chiefly of black wattle as at Blaney Junction and around several of the farmsteads in that area. This is one of the bleakest districts in the survey area.

Of rather different character is the coastal dune bush, which stretches almost unbroken along the whole of the

PLATE 17



Upper Izeleni Location and Izeleni Forest. The foreground is a land from which maize has been harvested and the stalks subsequently grazed. Gully erosion leads into an impermanent stream. Several imizi and gardens occupy the residential area beyond. On the ridge in the middle distance is the site of experiments in cultivating Phormium tenax.

coastline of the survey area. Its preservation is in large part due to the wisdom of the early land policy of British Kaffraria. As a rule no farms reach the coast; they usually stop short of the dune belt. In 1859 and again in 1861, when farms were being laid out in the East London district, a reserve of about $1\frac{1}{2}$ miles width was left between them and the sea²². When some of that reserve was divided into agricultural lots for immigrants the surveyor on the spot considered it advisable to prohibit all destruction of bush on sand hills²³.

ESTABLISHED PASTURE

Very little established or "artificial" pasture is shown on the coloured map. Although it often occurs in small units (paddocks of 2 or 3 acres) most of this class of land is recorded on the map. There are also, quite frequently, much larger patches of specially established grass or grass and légume pastures. These are frequently associated with the larger dairying enterprises or with the availability of irrigation water and equipment. The establishment of pasture of this kind in the unreliable climate of the Border needs considerable capital investment and regular irrigation. So far a truly permanent pasture has not been successful, except perhaps for that at the King William's Town sewage farm, which has some Kikuyu grass pasture irrigated by treated effluent. Where clover or lucerne are mixed with pasture

grasses, such as timothy and cocksfoot, they are considered to be pastures. Legumes by themselves are classified as crops. It has also proved possible to establish dry-land pastures of rye-grass. The established pasture, provided it is well watered, and, if irrigated, that there is a suitable reserve of water, enables the pastoralist to graze his stock throughout the year. He need not then grow feeding stuffs or prepare ensilage to supplement veld grazing in winter. The established pastures not connected with dairy farming for the fresh milk market usually belong to the farms where extensive sheep and beef cattle farming are carried on.

MARSHES AND ESTUARIES

Salt marsh on the coast of the East London district is so small in extent and so intimately connected with the larger tidal estuaries that it cannot be considered separately from them. The marsh lies on alluvium which is gradually silting up the drowned river mouths of this coast. It now remains above the high water mark. When rivers come down in flood the marshes are temporarily inundated. Occasionally, when the sand bars are washed away by freshets, low tide exposes a greater area of alluvium and marshland than when the bar pens back a lagoon. Marshland has been reclaimed for banana cultivation in the Cefani estuary.

BUILT-UP AREAS

On the field maps the built-up areas were divided into two classes: closely built-up and more openly built over²⁴. On the coloured map with this volume the classes are combined. They include industrial as well as residential land use. On account of the scale used, only the more extensive areas of settlement (larger than 2 acres) could be shown in red²⁵. Isolated farmsteads with their outbuildings are shown by a single symbol on the Base Map.

The only outstanding settlements which are specially shown are the two main towns, the rural townships, and coastal villages.

Bantu settlement is not shown in the rural areas because of its extremely scattered and impermanent nature. The urban locations which are of closely built-up shacks or cottages are marked in red. The only competition for urban land use generally comes from the demand for more space in a limited number of places near the main towns suitable for Bantu urban locations. The physical difficulties imposed by the site of East London and the existing development of townships and small holdings have meant that new Bantu townships on any great scale have had to move much further from the city centre. The new Bantu township is nine miles out, in open country at Mdantsane. It will help to house those who work in the city and its suburbs.

In this sense then settlement begets further settlement. Further development of built-up areas may also affect agricultural land use. Recently, the number of applications for township declarations in Amalinda's intensive market-gardening area may mean that market-gardening will be forced to migrate a little beyond this area into localities such as Wilsonia and Arnoldton.

ASSOCIATED NON-AGRICULTURAL LAND

This heterogeneous category of land use includes three main classes (distinguished only on the field maps). They are all associated with towns or with the non-agricultural activities of man. As this type of land is not built on to any great extent, it can be regarded as potentially agricultural land set aside for specific economic or social activities.

First, industrial waste land, brickfields and quarries, where they are large enough, are set aside. Aerodromes form a second class. Although the latter may be grazed occasionally, their main use is for transport and not farming. Lastly, places of recreation, which often cover considerable acreages, are classified with other non-agricultural land. It would often be possible to utilise such ground for pasture but in practice this is rarely done as a grass sward for a golf course or football pitch is difficult to establish and maintain. All kinds of sports-grounds and ornamental parks

and gardens are considered non-agricultural.

The distribution of land with this usage is typically peripheral to the main built-up areas, chiefly because of lack of space in the centres of towns. This tendency is perhaps increased by the fact that the towns were laid out in township blocks. The earliest of these, in East London West, East London East and Panmure, were not provided with open spaces amongst them. The only open spaces were (some still are) on the slopes at the edges of the townships (Victoria Park) and between townships, in wedges of land which could not easily be developed on a grid pattern.

Although much of the commonage at East London is now rarely used for grazing and is virtually an open space for the enjoyment of the neighbourhood, it has been left as unimproved grazing as it is not yet alienated. This commonage, which was formerly much more extensive, has provided much needed land for the expansion of housing and industry and has cost the city relatively little. This is in contrast to a city such as Johannesburg which grew up on land already subdivided into farms, and had to contend with land values inflated by the success of gold mining and concomitant urban development. Perhaps this is why East London has for long been a spacious city with relatively few tall buildings, with wide streets and plenty of marginal space for expansion of suitable categories of urban growth²⁶.

UNPRODUCTIVE LAND

There is very little of the survey area which can be termed unproductive in that it is potentially, as well as actually, useless for either agricultural or urban development. Only the narrow strip of sand dunes, some of which may have been denuded of bush, and an occasional rock outcrop such as Cove Rock, can be cited as unproductive.

REFERENCES TO CHAPTER 11

1. As described in Economic Geography, 26, 1950; pp.1-5. Advice was also given by Professor L.D.Stamp, C.B.E.
2. The World Land Use Survey of the International Geographical Union (see note 1) uses "unimproved grazing".
3. Enclosed, usually by wire fence.
- 3a. Personal communications - Mr.T.Connellan and other farmers in the Kei Road area.
- 3b. Henrici, M., An investigation of Pastures in the Eastern Province and in the Albany District, Department of Agriculture Science Bulletin, No.134, 1934, p.8.
4. These are Stock Inspectors' districts, for which livestock totals were kindly made available by the Department of Agriculture, Division of Veterinary Services.
5. South African Native Trust between 1939 and 1942.
6. See Section (iv) below.
7. Xhosa terms expressing the difference in the character of the grazing and comparable with the terms used by white farmers for the same differences.
8. The five coastal districts east of the Nahoon river exclude Newlands location.
9. Breidbach and Hanover together: (source for 1875, 64-'76)

1875:	1,255 sheep	37 goats	214 cattle
1956:	252 "	141 "	2,004 "
10. This is the latest census for which this detailed breakdown is available.
11. Blue Book of the Cape of Good Hope Colony, 1875: Appendix JJ, pp.33-36.
12. Census of Cape Colony, 1875: G4-'76, gives 5151 sheep in this ward, which is hard to reconcile with the Civil Commissioner's remarks. The latter however may refer to the position relative to the then recent past.

13. Blue Book, 1875: JJ, p.34.
14. Kotze, J.J.J., Sheep farming in the Sour-Grassveld Area, Department of Agriculture Bulletin No.294 (quoting Preller, J.H.) and Henrici, M., An investigation of Pastures in the Eastern Province and in the Albany district, Department of Agriculture Science Bulletin No.134, 1934, p.1.
15. Information can be obtained from the Sub-Director of Veterinary Services, East London. Most livestock diseases are discussed in Handbook for Farmers in South Africa (1957), Vol.III.
16. See Story, R., A Botanical Survey of the Keiskammahook District, Botanical Memoir No.27, 1952, p.88.
17. Summer cereals: mealies, kaffir corn, buckwheat.
Winter cereals: wheat, barley, oats, rye.
Field vegetable crops: onions, potatoes, sweet potatoes.
Pulses: peas, beans, soybeans.
Oilseeds: sunflower seed, groundnuts.
Industrial crops: tobacco, linseed, cotton.
Hay and fodder crops: cowpeas, lucerne, manna, teff, lupins, and other cultivated grasses.
18. Parliamentary Papers 1851, XIV, 635. Select Committee on the state of the Kaffir Tribes, Q.1049, Rev.J.Adamson, See also chapters 7 and 12.
19. Forest is normally, and henceforth, a term reserved for indigenous woodland. Plantations are usually composed of exotic species and are clearly distinguishable on aerial photographs by their regular lay out.
20. Plantations are shown separately from forests on the map of vegetation at the end of this volume. D.M.Comins discusses the ecology of the forests in chapter 5.
21. See photograph opposite p. 231
22. Letters from Surveyor General, Brit.Kaff.to High Commissioner, Brit.Kaff.Bryant to Maclean, 1 June 1859 and 27 Jan.1861, Cape Archives, SGBK.

23. Surveyor Dowling's report in Report of Select Committee on Immigration, A5-'76, Appendix B.
24. The second class corresponds to the Houses with Gardens of the Land Utilisation Survey of Britain. The manuscript field maps are deposited in the Department of Geography, Rhodes University.
25. In some instances the red colour of built-up areas does not coincide exactly with the grey hatching on the Base Map. The red is a more accurate assessment of the extent of built-up area. The data for the Base Map and the Land Use overprint were compiled at different times and on maps of different scales and standards of accuracy.
26. More fully discussed in Chapter 12.

Chapter 12

LAND USE REGIONS

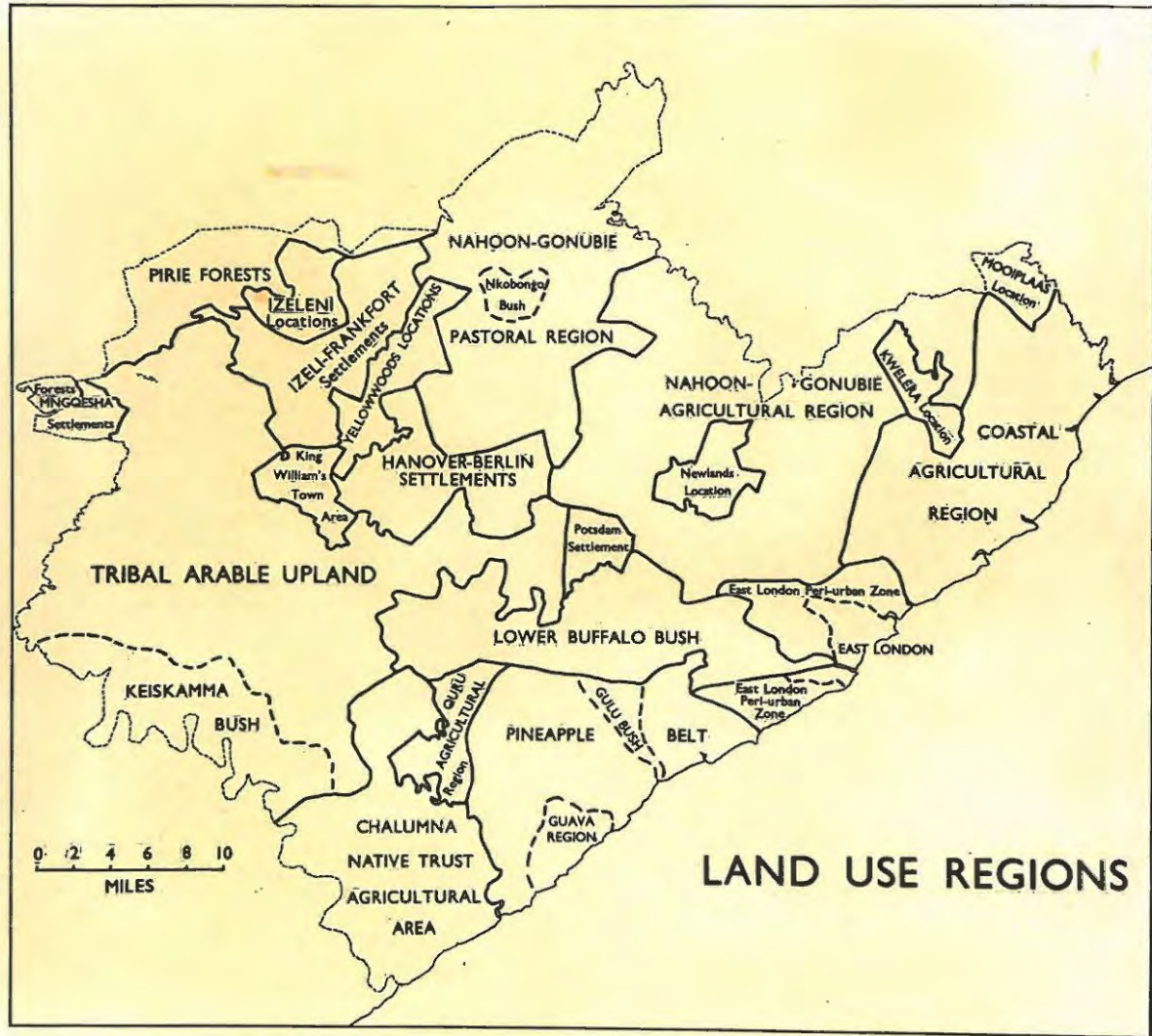
A land use region is primarily an area which possesses a certain uniformity of land use. The assessment of regional character may be based as much on the relative proportions of different uses and the shapes of the component parts of the pattern as on the possible dominance of a particular use of the land. It may be considered proper to define a land use region in these terms, but it is necessary to go further and to relate land use to the interplay of factors such as physical conditions and historical, sociological and economic considerations.

Land use regions in the Border region have been distinguished mainly on the basis of the visible pattern of use. But as this subdivision of the survey area into more manageable and significant regions is to some extent subjective and also needs to be related to the underlying factors, these aspects have been considered as well. The boundaries of the land use regions could have been drawn mechanically to include fixed proportions of the different uses of land. They have, however, been made to follow significant boundaries some of which are visible in the landscape, while others, equally valid but not apparent to the eye, coincide with the transition from one type of farming to another.

Some land use regions are not primarily agricultural in character. The urban regions and their surrounding zones, with distinctive intermingling of urban settlement and intensive agriculture, come into this category.

The names here given to the land use regions of the Border are not in general local regional names in actual use in the area. There are in fact few local regional names in the English language available for use. "Guavaland", so-called by many of the local farmers, has been named the Guava Region to bring it into line with the other terminology. There are more regional names in Xhosa but they usually apply to smaller areas such as individual locations. The term Tamara¹, with its subdivisions elisezantsi and eliphezulu (lower and upper), probably refers to a wider region. There is no single name in Xhosa for the whole of the area named the Tribal Arable Upland. It is inhabited by people of several different tribes and this is responsible for the apparent lack of unity in the Xhosa mind: its unity is one of land usage and economy.

In any country-wide mapping of land use which would fit in with the scheme of the World Land Use Survey, the land use regions here adopted would become units, that is areas of one land use type, if portrayed on the scale of 1 in 1 million.



THE REGIONS

1. The Pirie and Mngqesha Forests

In the north-western corner of the survey area, along the watershed between the Buffalo and Keiskamma Rivers and on the well-watered slopes facing south-east, lie extensive woodlands. Their composition is described in chapter 5. They lie almost entirely above the 2,000 feet contour and receive an average annual rainfall of between 30 inches at their lower margin and 70 inches at their upper edge.

This region is completely dominated by woodland; three-quarters of it is occupied by forests and plantations. Grazing is next in importance, but somewhat less than half of its area is used for domestic livestock. The central part of the region is characterized by an almost unbroken stretch of forest and ungrazed glades. Cultivation is very insignificant and is found usually in association with the veld used for grazing at the margins of the Forests. It is limited to properties not worked by the Department of Forestry. Away from the main stretch of forest it is apparent that the woodland hugs the steeper slopes and lies in the kloofs, especially in Upper Izeleni location and at Mngqesha. In these areas the forest is broken into separate tracts usually ending quite abruptly where they meet the veld of the locations and commonages. Several of these small forests are demarcated

and preserved, and are occasionally fenced off. The preservation of demarcated but unfenced forests is a difficult matter; for instance, the forest in Released Area 26 has been extensively cut over by the inhabitants of the adjoining Izeleni and Donnington locations. Goats frequently browse there and largely prevent the regeneration of the forest. The bulk of the demarcated forest is on Crown land occupied solely by the Forestry Department. At Izeleni the demarcated forest lies within a scheduled location, Crown land vested in the South African Native Trust. The glades between the forests are grazed by the animals of the location. Between Izeleni and the Cwengcwe forest is a group of farms which have recently concentrated on forestry rather than livestock husbandry. Many exotics such as Eucalyptus spp. and Pinus spp. have been planted here. Further planting was in progress on Farm 344 at the time of the survey.

Some of the small saw mills, like the one on Farm 345, have inherited the role of the early exploiters of the forests who began by cutting out timber useful for building, fencing, mineworks and wagon construction. Haynes' Victoria sawmills were opened at the Pirie in 1859 and machinery was also provided there to grind corn into meal and flour². The unnumbered lots adjacent to Forest Lot 6 were alienated to Haynes and undoubtedly helped to supply timber to the sawmills which were just below the Maden Dam. The aerial photographs³

taken in 1953 clearly show how little high forest remains there.

Exploitation of the forests was controlled between 1860 and 1885 by licensing sawyers. The new department of the Superintendent of Woods and Forests (Cape Colony) gradually evolved a forest protection policy during the 1880's. Encroachment by Bantu cultivators, and grass fires at the top of the mountains, were the chief problems. A Forest Demarcation Commission settled the boundaries of the forests in the King William's Town division in 1885⁴. For a while, from 1884, a number of "forest cultivators" were allowed to plough parts of the forest and to grow crops there, thus preparing the ground for planting trees⁵. At that time, 64 out of 66 of these cultivators were Bantu who were doubtless attracted by the right to graze up to 20 cattle in proportion to the amount of cultivation done. Steps were soon taken to supplement or replace the supply of yellowwood timber for sleepers. By 1885 the forest cultivator system was beginning to produce the seedlings of Eucalyptus and Pinus which were to provide the timber for sleepers⁶. Gradually the principal timber source has become the plantations of exotics⁷. In 1910 it was stated that the decaying natural forest at the Pirie would be replaced by exotics to protect the growing indigenous timber trees⁸. Even as recently as 1937 in the Government forests of the King William's Town area it appears that the quantity of

Table 40

ORIGIN OF TIMBER AND OTHER WOOD, GOVERNMENT FORESTS,

KING WILLIAM'S TOWN DISTRICT

	1937		1946		1950		1956-7	
	Planta- tions	Indigenous forest	Planta- tions	Indigenous forest	Planta- tions	Indigenous forest	Planta- tions	Indigenous forest
Mine prop ^s t.	56	174	-	-	-	-	-	-
Mining timber c.f.	-	-	-	-	-	?	-	-
Waggon wood c.f.	-	5800	-	50	N	N	N	N
Fuel and charcoal wood t.	584	789	679	506	264	152	46998*	5998*
Timber for other industrial pur- poses c.f.	1667	9176	189759	15267	N	N	N	N
Timber for non- industrial pur- poses t.	336	367	492	83	N	N	N	N
Soft wood c.f.	N	N	N	N	123070	15997	223975	2754
Hard wood c.f.	N	N	N	N	3846	2306	164	1482
Pulpwood t.	N	N	N	N	-	-	-	-
Poles, spars and droppers c.f.	N	N	N	N	22774	919	88624	236

Units: t. short tons; c.f. cubic feet; * 1956-7 figures
in cubic feet; N not specifically enumerated.

Sources: Agricultural Censuses (partly unpublished) and
Conservator of Forests, King William's Town.

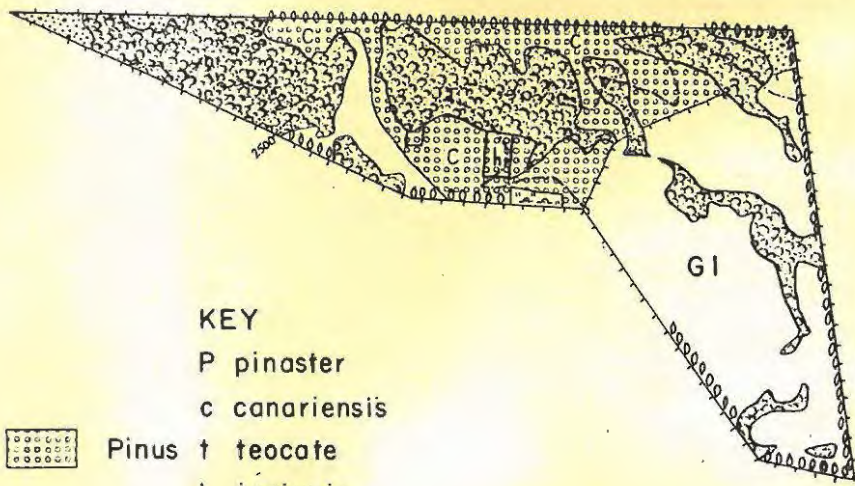
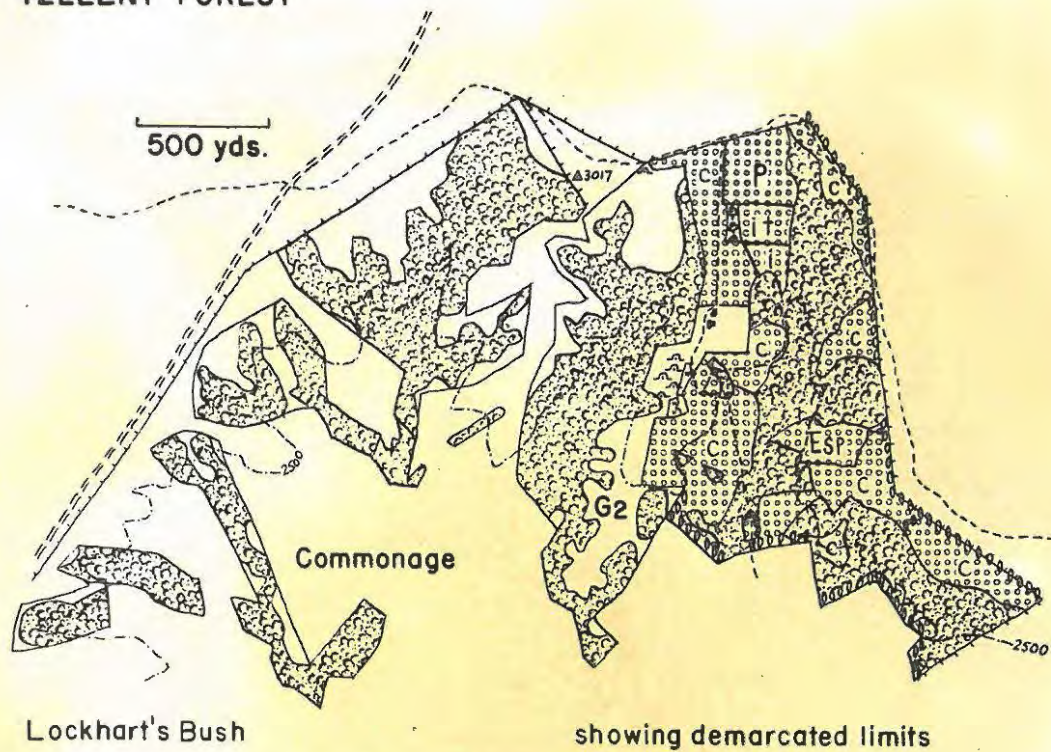
timber from the indigenous forest exceeded that from the plantations . The position is now reversed.

The type of timber and other produce depends principally on the kinds of trees grown in the plantations of each forest. The forests with the greatest acreage under exotics, viz. Evelyn Valley and Cwengcwe, concentrate on softwood logs which are cut up at the Isidenge sawmills close by. The forests which do not have easy access to Isidenge, viz. Pirie and Izeleni, have concentrated on the production of untreated poles and spars which used to be sent to the Stutterheim State sawmills. Untreated poles and spars are also produced in quantity by Evelyn Valley forest but they amount to less than a seventh part by volume of the softwood logs from there. Wattle bark is not an important item from the Amatole forests: only Pirie forest produces any. A small contribution to the revenue of the forests is made by grazing-fees charged to foresters and to labourers living there, and to neighbouring farmers.

The details of land use within a land use region are more clearly seen in the case of one typical economic unit, whether it be farm, forest or location. In each land use region, therefore, one or more examples will be used to relate land use to the factors which have a bearing on it.

The Government Forest chosen to typify the Pirie Forests lies to the east of the main block of forested country. It is

IZELENI FOREST



KEY

- | | | | | |
|-------|------------|-------------------------------|-----------|------------------|
| | P | pinaster | | |
| | c | canariensis | | |
| | Pinus t | teocate | | |
| | i | insignis | | |
| | h | halepensis | | |
| | p | paniculata | | |
| | Eucalyptus | s sideroxylon | | |
| 00000 | | Belts of E. saligna & madenii | ===== | National road |
| ☞☞☞ | | Quercus sp. | ----- | Other roads |
| ●●●● | | Populus canescens | ■ ■ | Buildings |
| | | Indigenous forest | | Bantu huts |
| | | Arable land | —+—+—+—+— | Fences |
| | | Veld not used for grazing | ~~~~~ | Contours in feet |

in two detached portions (two miles apart) both of which lie south of the Buffalo-Kubusi watershed^{at} altitudes between 2,000 and 3,000 feet above sea level. Much of the land faces south but some has a westerly and a little an easterly aspect. Where valleys run in an east-west direction there is a danger that on the north-facing sides exotics will die in droughts. This also applies to western aspects which receive the afternoon sun after the heat of the day. It was said that 50 per cent of trees were lost in such aspects in one particularly bad season. Aerial photographs of this forest suggest that the indigenous forest grows to greater height on south- and east-facing slopes. Generally the annual average of 36 inches of rain is spread sufficiently well and is reliable enough to promote the growth of timber trees. There is no danger from frost damage on the slopes. The worst of the hail storms of the summer usually pass to the north of this part so that damage from that source is light. This is an advantage that any forest nearer the coast would have. Springs in the forest suggest that the water table is high. This, like other forests, was demarcated originally not only to prevent encroachment but to preserve the sponges. "The conservation of streams of water has been laid down as one of the main objects of forestry in the Cape Colony." ⁹ A spring supplies water to the tree nursery and to the forester's house, and has to provide water for fire-fighting. Fires are

a danger to the highly inflammable exotic Pinus timber, being a great hazard in the dry winter. To prevent sparks from neighbouring veld fires from spreading to the plantations a belt of Eucalyptus saligna and E.madenii has been planted along much of the boundary of the forest.

There were 810 acres of plantations altogether and twice as much or more indigenous forest. Grazing occupies about another quarter of the total demarcated area. The main forest was demarcated in the initial period of forest preservation in 1888, and the outlying piece (Lockhart's Bush) in 1907. Planting virgin veld continues in this outlying tract.

The principal timber tree is Pinus canariensis, grown for poles. It is no longer considered necessary to plough the ground before planting: instead, seedlings are planted in holes between January and April when they are about one year old. During the period of growth they are not thinned out. P.canariensis takes about 15 to 20 years to mature to a suitable size (7 inches in diameter) for poles. Timber felling is carried on the whole year round. The poles are sent via the Isidenge ^{saw mill} to Stutterheim¹⁰ where they are treated with creosote.

The revenue from this forest in 1956-7 was much less than for a sheep and cattle farm of comparable size. It is of course in the national interest to protect the headwaters of the Buffalo Catchment from erosion and to provide a local

source of timber for construction and fuel. Logs amount to 25.3 per cent of production, other timber accounts for nearly 70 per cent. Only 4.9 per cent of the volume of wood disposed of was firewood. The forests contribute only 3.4 per cent of the same total and that mostly firewood. Over 70 per cent of the production of plantations is shown as "Gratis Issues" which are processed further by the Forestry Department before sale. The produce of the indigenous forest is sold on the spot.

It was stated that there was no shortage of labour at this particular forest. Apart from one White Forest Officer and a temporary White foreman, there were 5 Bantu permanent labourers. Four of these were police guards. There were 15 other Bantu part-time workers living in the Forest area. Each member of the permanent labour force is allowed to cultivate a small piece of ground and to keep a few cattle for domestic use. About 120 casual labourers were taken on in the summer. As is usual throughout the survey area the labour is harder to get in the spring and summer when the Bantu are cultivating their own crops.

Being on the margin of a Bantu area this forest illustrates some of the problems arising from the competition between different uses for land. The area in which the plantations lie, in the main block of the forest, was alienated from the commonage of a surveyed scheduled location. Some of this

commonage remains between isolated blocks of demarcated forest to the west. (See the sketch map.) As some of the demarcated forest is unfenced there is a certain amount of encroachment by livestock and by unlicensed woodcutters in search of firewood. A small stretch of grazing practically enclosed by indigenous forest is let out to anyone who can pay one shilling per month per head of stock. Some small patches of veld between forest and ~~of~~ the location boundary fence are not grazed at all by domestic livestock. In the detached part of the forest to the east the most easterly camp is as yet unplanted. Grazing rights over it are auctioned publicly and at the time of survey brought in over £140 per annum.

2. The Lower Buffalo Bush

This region is not so completely dominated by woodland as the previous one. In the central and eastern parts up to two-fifths of the area is covered by forest or bush. Towards the west however the area of forest is much smaller. On the whole, the wooded area is much less continuous than in the mountains. The most extensive stretch of continuous woodland lies athwart the Buffalo valley near Fort Grey, where there has been some attempt to preserve the woodland by including it within a Government Forest.

The Lower Buffalo Bush is a distinctive wedge of largely unimproved country lying between areas where clearing and cultivation have made substantial progress. It occupies the

whole of the Needs Camp Ridge, or Goolah Heights, reaching down to the Buffalo river on the northern side and to the Quru, Gulu and Goda valleys on the southern side. The eastern half of the region includes the north flank of the Buffalo valley; the north flank is excluded from the western part where Bantu areas of rather different character reach right down to the river. The major part of the country is highly dissected. The only large patches of flat land are on the top of the main ridge, in the south and in the bottom of the Buffalo valley. This applies less to the western end of the region, which is higher, less deeply dissected, and drier. The average annual rainfall decreases by about 5 inches for every ten miles along the ridge away from the sea. At Mount Coke it is just below 25 inches. In this area the only extensive tract of forest is in the Mount Coke Reserve, where there are also wattle and Eucalyptus plantations.

A significant amount of clearing and cultivation in this western part is associated now with cash crop farming with livestock as a side-line. There are several farms here growing pineapples; some deciduous fruit orchards have also been planted, but largely before the pineapple boom¹¹. One-eighth of this sector is cultivated and much of the veld carries thickets of thorn trees and other bushes. Some of these, such as Grewia occidentalis, form valuable additions to the diet of the domestic livestock of the region¹².

In the central and eastern sections of the region cultivation is limited almost entirely to the bottoms of the larger valleys and to the crest of the ridges, next to the road which runs along its length. The types of crops grown are similar to those found further west, except that the more sub-tropical varieties of fruit do better here. Near Bridle Drift the flood-plain of the Buffalo river has been irrigated for citrus groves and pastures. This is one of the few parts where there is enough water for regular, large-scale irrigation. Water is pumped out of the river's deeper pools, and its regularity is assured by there being a constant flow from the Laing Dam which lies just over 20 miles upstream. The greater width of the valley floor at this point confers a tremendous advantage on the farmers with riparian rights. There is little or no irrigation on the ridge crest. Although most farms elsewhere also stretch down from the ridge to the river, it is frequently inconvenient to utilise the "riverlands". They are difficult of access and usually remote from the homestead. Irrigation of pastures for dairy cattle, or of orchards, would be impracticable in that situation.

Livestock farming is mainly concentrated on the production of cattle for sale. On the ridge there is only a little dairy farming, and then mainly for the sale of cream from milk surplus to domestic requirements. There are very few sheep.

Dairying with the object of producing liquid milk for the East London market is more typical of the northern side of the lower Buffalo valley, nearer the railway and the routes of milk-collecting lorries. This type of farming is in general exceptional. Extensive farming is more typical and large farms are the rule.

Farms on the ridge nearer East London send fruit, vegetables, and dairy and poultry products to the municipal market in the town. They have the advantage of a section of tarred road. Farms beyond the end of the tarmac are deterred from transporting those perishable commodities very far on account of the rougher roads and the longer time taken.

The two Government Forests in the region have somewhat contrasting functions. Mount Coke sells a great deal of firewood and construction timber, coping with the demand of neighbouring Bantu areas which are nearly denuded of usable timber. Although the Fort Grey area formerly supplied great quantities of firewood to East London, the present Government Forest concentrates mainly on pulpwood which can be more easily transported from here ^{than from Mount Coke} to East London or to Buffalo Harbour. In the nineteenth century it is evident that the West Bank and the Needs Camp Ridge were at a disadvantage compared with farms on the East Bank when it came to supplying East London with timber and firewood. The lack of a bridge across the Buffalo and the extra cost of carrying wood over

the pontoon were apparently critical¹³. Licence revenue at the newly created Fort Grey Forest suffered and the Forests at Needs Camp and Fort Pato were too far away to be able to supply firewood economically to Panmure, but local lime-burning absorbed some¹⁴.

The following farm is a typical example, even if a little larger than average. It covers over 3,500 acera and comprises two 1,500 acre grantee farms, one of which has belonged to the same family since it was granted. The double farm unit straddles the ridge and thus has considerable local variety of veld. That on the southern side was described as sourish and that on the north as sweeter. The average annual rainfall of about 30 inches is favourable for cash crop cultivation in normal years. The existence of a large area of doleritic soil, which retains moisture longer than the grey sandy loams, aids crop raising. Because of its height at over 1,000 feet above sea-level, pineapples grown there on the south-facing slope ripen about two weeks later than those on the coastal plain. Those facing north ripen earlier. The field crops of high value are grown nearest the road in lands connected by motorable tracks with the main road or with the homestead. These include pineapples (40 acres), potatoes (10 acres), green beans and peas (2 acres). Maize, some of the potatoes, and dried beans, occupy lands on the extremities of the farm, where there is more flat land available for extensive

cultivation. Some barley was also grown on those lands. Dried beans (4 acres) and maize (50 acres) are grown chiefly for supplying rations to the Bantu labour force. The remainder is sold for cash. Pineapples are sold to various canners and packers in East London and at Kidd's Beach¹⁵.

A large herd of between 280 and 300 head of cross-bred Afrikander-Shorthorn cattle are "ranch"ed in extremely large camps. They are kraaled every night and young oxen are also inspanned to accustom them to handling. Since there are no boreholes on the farm, drinking water for stock is supplied by numerous small dams throughout the farm. The calves are usually run with their mothers so that it is possible to provide only the farmer's household with milk. The main object is the rearing of tollies¹⁶ and heifers for sale at the Holl's Hill and Arnoldton sale pens and the abattoirs at Cambridge. Formerly considerable trade in cattle was carried on in the Native reserves. Since the restrictions on the entry of livestock to these areas have been applied, the owner has turned to the market for beef-cattle, and this avenue is now being exploited. In spite of the fact that most of the farm area is used for grazing, the income from livestock in 1957 was only two-fifths of the income from crops. This would be typical of any farm in this area growing pineapples in addition to livestock rearing. The farm income is increased by 25 per cent from the output of a small quarry.

There are 22 Bantu families living on the farm and supplying labour for farming and other operations. Of these, 21 men work all the year round, 4 unmarried men and 10 women work part-time. The permanent labourers are allowed to keep up to six head of livestock on the farm. They are also given the use of two lands amounting to 40 acres. They are used for maize crops and are cultivated by the families of the labourers. As farm servants have 120 head of cattle out of the farm's total of 400-420, it is seen that by engaging in cash crop farming the potentialities of the livestock side are severely limited, if, as is said, the number of stock is at the limit of the carrying capacity.

A large quantity of machinery and motive power is required for this extensive farm. It includes two trucks and two tractors, blacksmith's equipment and gear for the construction of small dams and roadways.

3. Tribal lands

Since their dismemberment in the middle of the nineteenth century the tribal areas have formed discrete tracts possessing a broad similarity of land use type and rural economy. This is not to say that whatever their situation, and whatever their inherent characteristics, they are alike in all respects. Nevertheless a typical form of land usage can be recognized, in varying degrees of intensity of development, throughout the Border Region. The Tribal areas

are thus divided into their separate tracts and will be examined one by one. The first is what might be termed the type-area, the Tribal Arable Upland. There is no one geographical term for this region. It is now divided into a number of locations named after tribal ancestors, rivers, or other smaller features. The unifying characteristics are the ithafa or high-level plain and the people of Xhosa and Mfengu tribes who are largely following traditional forms of land utilization. It will be seen that differences in land tenure have very little effect on the outward form of present day land use and scarcely greater effect on the detailed manner in which land is used.

The Tribal Arable Upland

This region is not homogeneous when the detailed pattern of land use is studied. It is possible to subdivide it into the main upland tract and the Keiskamma Bush. The line of subdivision follows roughly the boundary between the ijojo and the isandle.¹⁷ The Keiskamma Bush consists of isandle or sweet veld. The land use pattern of the latter is broken up into smaller units, and there is a significant proportion of woodland. This boundary cuts through several locations, thus emphasizing the similarity between the farming activities on either side of the line. Each location works as a unit, under the system of communal tenure that operates throughout the tribal areas. It is not possible to separate farms in

this context, in order to compare them with individual farm units in the White areas. It is possible nevertheless to particularize by studying the holding of one family group within the community of the location.

All tribal lands are characterized by their high proportion of arable land. The Keiskamma Bush has less than normal, partly because the density of population is lower there and partly because there is insufficient land suitable for cultivation. Somewhat less than a quarter of the land is cultivated, whilst woodland covers just over a quarter of the sub-region. Much of this woodland has very little usable timber left in it, but it still provides firewood, however, not only for the immediate region but also for the remoter locations which no longer have their own source of firewood.

The main tract of this area has only two components in the land use pattern. They are arable land and veld used for grazing. The small patches of forest that are occasionally preserved for one or other reason, are usually too small to be shown on the map of land use. The important exceptions are the areas of demarcated forest at Tamara and to the west, and the patches in the basin of the Izeleni river. There are one or two small plantations established by the Native Affairs Department. The proportion of arable land is higher here, varying from a third to two-fifths of the total. The arable land is located in large blocks of irregular outline,

often filling the whole of a valley or basin, generally on a slope in a relatively sheltered position. The summits and crests of the ridges in the ithafa are exposed and only rarely have arable land on them. The greater the relief, the less flattish land there is available for the local concentration of arable land into one large block like those at Mamata and Bulembu locations or that crossing the National Road at Qaga and Masele locations. Most of the veld in this area is completely denuded of scrub. In a few localities there are patches of Acacia scrub which provide a very limited amount of firewood, and brushwood for enclosures. The composition and deterioration of this veld are fully dealt with by D.M.Comins¹⁸.

The present-day methods of land use have evolved gradually from the traditional methods of the period before the Bantu tribes were confined to their areas by White settlement. There have been no major changes in commerce which have affected the crops grown, the livestock held or the methods used. It seems certain that the Xhosa tribes had maize before they arrived in the survey area. In the first few decades of close contact with the settlers they fairly quickly learned to keep sheep. There has been a steadily growing pressure on the amount of land available for Bantu settlement as a result of the rise of the population in the reserves. One may judge very roughly the extent to which the pressure on the land has increased since 1875 by comparing the

amount of land cultivated by Bantu with the total areas of the two districts combined, then and now. In 1875 non-Whites in reserves cultivated 82.7 square miles out of 3,483 square miles, about 2.3 per cent¹⁹. In 1955 there were 156.2 square miles of cultivated land in the reserves, out of a total area of 1,547 square miles, or over 10 per cent, a remarkable increase in view of the contraction in the size of the two districts. If it were possible to assess the area of the reserves at the earlier date these differences might well be magnified.

From the descriptions by travellers such as Barrow, Paterson and Backhouse and by early missionaries²⁰, it seems clear that the Xhosa tribes were semi-nomadic pastoralists who cultivated only desultorily when they were in need. Later evidence given to the Cape of Good Hope Commission on Native Laws and Customs (1883) and to the South African Native Affairs Commission (1903-5)²¹ confirms these observations and adds details. The land was the property of the tribe and was vested in the Paramount Chief. Cattle, horses and goats grazed on open range during the day but were kraaled at night near the umzi. Such cultivation as there was was subsidiary to grazing rights. It appears that it was the cultivator's responsibility to keep livestock away from his garden, but that at the same time the herdsman should not negligently allow his beasts to stray on to the gardens, especially when

PLATE 18



An umzi of 5 huts and cattle kraal below it, in Upper Izeleni Location (Hlangana's). A garden lies behind surrounded by Agave americana. The small brushwood kraal in front belongs to another umzi.

the crops were "in ear".²² There was no limit to the number of cattle which could be kept²³. In the past, if an area had become overstocked a section of the people moved away to find fresh pasture. Sometimes the garden, to which every married woman was entitled, was enclosed²⁴. These gardens do not appear to have been of uniform size but depended on the activity of the families cultivating them²⁵. They were as a rule restricted to the valleys²⁶. It is clear that the cultivation of winter crops was prevented or at any rate discouraged as it interfered with the rights of common grazing²⁷. It seems that the changes which took place in the reserves after the middle of the nineteenth century affected newcomers and newly married men. Both of these groups were naturally welcome in the community, but it became impossible to give out garden land to every married woman, except by seriously reducing the area of the grazing land in the location. The people objected to the latter course because they considered that cattle were of greater importance than crops²⁸. White authorities considered that individual tenure might prove to be the answer to the increasing demand for land, as then only the individual owners would have the right to work and occupy land in locations and the amount of arable land would also be limited by surveying lots of a certain size²⁹.

It must be emphasized that cattle were not kept by the Bantu only for the sake of their meat. Indeed their main

diet when the cows were in milk was amasi, a specially-prepared sour milk. Cattle were killed and feasted upon only on ritual occasions. Their principal use was as a "bride price" (ikhazi) in the practice of ukulobola. Originally about ten cattle might pass from the family of a prospective bridegroom to the bride's father. W.G.Bennie writes³⁰ "the transaction (ukulobola) was never looked upon as a sale but as a contract of union, the bona fides of which was sealed by the transfer of the khazi, and as an acknowledgement on the part of the man that he was receiving or had received something he valued ... The custom provides a tie, binding the family together ..."

By 1883 it was noted that the number of cattle in the khazi had fallen from ten to seven or eight³¹, emphasizing even then the growing pressure of population in relation to resources. It is nowadays fairly common to employ sheep and goats as well as cattle for ikhazi. The reluctance of conservative and even Christian Xhosa to abandon the practice with its strong background of isiko, custom, lies at the root of the slow adaptation of these people to a settled type of peasant farming. Although they were at first by no means independent of the crops they raised in the small garden patches, their dependence on them has increased to the point where the maize is now considered their staple food. Nearly all locations are overstocked and cannot provide the grazing

necessary to keep milking cows in full production.

At the present time land utilization differs slightly as between the traditional, unsurveyed locations, the surveyed locations in which the influence of the mission churches is important, and the scheduled locations where betterment measures are in force. In 1955-6 the largest expanse was covered by the first group and it will provide the detailed examples for the study of Bantu agriculture. In the summer of 1956-7 a special survey of 29 Bantu families was made in the area between Line Drift and the Tamara Heights³². This area includes one location which had accepted betterment in 1957. Special reference will be made to differences of land utilization between it and the other locations. In order to examine whether there might be a correlation between the conservatism of farmers and their agricultural practices, the research assistant was asked to record families as 'Red' or 'Christian'. It is realised that these terms are not applicable to all the members even of one family, not to all aspects of their life³³. The results are set out in Table 4f.

Until the application of restrictions on the numbers of livestock, ~~which are~~ a feature of the betterment measures, most of these locations imposed no limit to the number of livestock allowed to graze on the idlelo, the veld common to the community. Even at the present time, although the pressure

Table 41

SUMMARY OF SOME OF THE DATA DERIVED FROM THE SURVEY
OF BANTU FARMING

By families, March to May, 1957.

	<u>Reds</u>	<u>Christian</u>	<u>Half-Reds</u>
Families in Sample	16	9	4
<u>CULTIVATED LANDS</u>			
Holding 4 lands	1	0	0
" 3 "	1	1	1
" 2 "	5	3	2
" 1 land	9	5	1
Total lands held by all families	26	14	8
Total lands borrowed by all families	5	3	1
Total lands worked by all families	31	17	9
Working 4 lands	2	0	0
" 3 "	2	3	2
" 2 "	5	2	1
" 1 land	7	4	1
Also owning gardens	7	8	1
<u>CROPS</u>			
Growing maize only	5	2	1
" " & kaffir corn only	3	0	2
" winter crops	4	9	3
Selling crops	2	7	0
<u>USE OF MAIZE STALKS</u>			
Cut for fodder	6	6*	0
Grazed only	6	-	2
Both cut and grazed	2	-	2
<u>CULTIVATION</u>			
Amalima sometimes used	6	0	3
Lands never manured	2	0	0
<u>TRANSPORT</u>			
Ox-waggon only	10	8	3
Sledge only	5	-	0
Ox-waggon and sledge	0	0	1
<u>LIVESTOCK</u>			
Selling cattle	5	7	4
Grazing sometimes hired	5	7	4

NOTES: 0 means none; - means none recorded.

* One family ploughs-in maize stalks sometimes, as well as cutting them for fodder.

on grazing is so great a tolerant attitude to cattle straying as far from Khalana as Masele has been noted. This is in spite of the perimeter of each location generally being fenced. There was great inequality in the number of livestock owned by the farmers in this sample. One had no cattle or sheep, but 27 goats; another had 56 cattle, 200 sheep and 42 goats in the location where he lived. The average picture may be given by fifteen of the sample who have up to 15 head of cattle and 65 sheep. A group which has about 7 or 8 cattle, roughly 20 sheep and no goats, is representative of Nonibe location, where stock was being culled under the betterment programme. Altogether 19 farmers each had 15 cattle or less. There were no significant differences between Red and Christian people. Many farmers outside Nonibe location had hired grazing away from their homes. Livestock, mainly cattle, had been taken to areas as far away as Bell in the Peddie district, Ntunja farms (East London district) and Trust land at Bekruipkop and Gxetu (Released Area 32). Fees for grazing on Trust property were reported as being about one-tenth those on farms belonging to Whites. There is often difficulty in obtaining permission to take cattle to Trust lands for they have a strictly controlled carrying capacity. One family owned a farm in the Peddie district and kept most of their livestock there. They were atypical in that they sold

butterfat to the creamery at Cross Roads.

Fourteen of the farmers interviewed said that their cows were dry. Of the others who were milking cows, eight were milking only one each. The daily yield is generally from half to three-quarter gallons of milk per cow. Probably a more important and more regular supply of milk lies in the herds of goats. Cattle are rarely sold by the Reds: they are more often exchanged when old for younger cattle³⁴. One farmer sold cattle at the stock fairs at Peddie and another sold grown-up oxen; but they were not typical of the majority. Most of the farmers killed cattle for sacrificial purposes, including many of the Christians. Goats and sheep are also occasionally slaughtered for similar purposes. When meat is provided for amalima feasts it is frequently goat meat. The most important source of income from livestock is derived from wool. This is sold, usually to the local store-keeper, but occasionally to the wholesalers in King William's Town for 6d. or 1s. a pound more. Only two farmers sheared their sheep just once a year. Most farmers, or rather their wives, kept a few fowls. Poultry is sometimes eaten but the eggs are more commonly sold by the womenfolk to provide ready cash for domestic necessities - sugar, coffee, tea, soap, shirts and dresses. Half the farmers in the sample kept a pig or two. Pork provides another source of ready cash when it can be sold in King

William's Town or even in Port Elizabeth. Donkeys and mules are rarely kept, but one man had a donkey team for hauling a scotch-cart used for water carrying.

Nowadays sheep, goats and horses are accepted for ukulobola as there are clearly not enough cattle in the average family for all purposes. There are at least five families who have to borrow spans of oxen so that they can plough their lands.

Probably the main source of food amongst these people is in the summer crops of maize, kaffir corn and pulses. It is not possible, with the information available, to assess the total yields of the lands under cultivation, nor is it possible to estimate the extent to which crops grown by each family supply their needs throughout the year³⁵. The actual extent of the individual crops cannot easily be ascertained as the figures were given in "acres" of varying size. It is, however, clear that maize predominates. Kaffir corn comes second in importance, followed by peas and beans. Pumpkins and melons are sometimes undersown in a maize crop. Birdseed (Phalaris canariensis) was grown by one farmer as a cash crop, but this is most unusual in the traditional areas.

The amasimi or arable lands are composed of separate lands divided from each other only by grass balks (iziqithi). Under the traditional system the arable lands are thrown open to livestock after the harvest has been won. This

winter grazing on the stalks of the summer's crop is a useful supplement to the veld. Some farmers cut the maize and kaffir corn stalks on their lands and store them against winter drought. None of the Christians graze animals on the stalks on their own lands. This practice is the chief restriction on the cultivation of winter crops. It has been discontinued in the Betterment Areas where winter crops are now the rule. If a farmer in the traditional areas wishes to grow peas, wheat or some other crop in winter, he has to protect it against depredations by grazing animals. Boys herding livestock are responsible for seeing that their charges do not trample the crops. The iziqithi and grass margins (imiviko) are ungrazed during the summer, but provide useful grazing in the winter. There is usually a rough fence or hedge around the amasimi. Only four of the 16 Reds grew winter crops but all the Christians did.

Although it is traditional for each married woman to have the use of a land, lands are now usually registered in the name of the male members of the family. Several families have acquired the right to use more lands than they would have enjoyed under the former system. There are Christian families with two or three lands, which cannot have been allocated for other wives. The Headman of each location virtually has power to allocate arable land in the traditional unsurveyed areas. Several lands were borrowed from folk who

were unable to use them for various reasons. Often a widow, not wishing to plough and cultivate a field allocated to her, will allow someone else to cultivate on a share-cropping basis. In this way an enterprising and well-thought-of farmer can acquire the use of several fields and thus increase his income. Fifteen families were recorded as having only one land each and twelve of these were not using a second. Each land is roughly between three-quarters and 2 acres in extent, and is usually oblong or wedge-shaped. Thus in the unsurveyed locations the arable land "fits" the contour better than in the locations where the arable land has been surveyed on a rectangular pattern and results in some lands being awkwardly placed for cultivation along the contour.

The produce of the amasimi can frequently be supplemented from the isitaya (small hand cultivated gardens). Less than half of the Red families possessed gardens but nearly all of the Christians had them. The gardens frequently receive more attention by manuring, weeding and protection than the lands in the amasimi, which are usually at a distance from the umzi. The gardens are close to the umzi and can thus be protected more effectively. A great variety of crops was recorded as growing in the gardens, but by far the most common was tobacco, others being peas, cabbages, spinach, pumpkins and potatoes. Cereals were recorded only twice and fruit trees (peach) had been planted in two instances.

Most of the other crops were vegetables. In one case a crop of Napier fodder in the garden had been destroyed by fowls.

During the survey the amount of winter crops gathered in 1956 was ascertained and the expected yield of summer crops was estimated. As the survey took place during the late summer of 1956-7, these estimates were considered fairly reliable indications of the forthcoming harvest. Those who grew peas, particularly as a winter crop, were able to produce a surplus for sale at between £8 and £9 a bag. Undoubtedly this income would help towards providing maize for the main food supply. Comparing these estimates with the number of people reported to be living at each umzi, and basing the calculations on the more optimistic estimate of the season's maize crop, it is clear that in every case there ^{would} be insufficient to supply the needs of the family³⁶. Even by counting only those engaged in farming, only one eighth of the families in the sample grew more than 3.5 bags of maize per person. The median figures for Red families were slightly below those for Christian families. Reckoning only those engaged on the land, one Red and two Christian families grew up to four bags per person, and thus subsisted on maize. Because more of them grew other crops for sale, the Christian families were able to buy staple food from the proceeds of their land.

Relatively few of the families in the sample sold any of

their crops. Two Red and seven Christian families out of 29 had sold crops. Methods of disposal varied but most sales were effected to local traders, the reputedly higher prices given in King William's Town were not attractive enough to make the long road haul of between 12 and 20 miles seem worth while. Ten Red families owned ox-waggon and five had sledges. One half-Red umzi had both an ox-waggon and a sledge. Only eight Christian families possessed waggons but none of them had sledges. This suggests that the Christian families are a more progressive group, but it may mean that being progressive in this way is a sign of being Christian. Motive power for ploughing was provided exclusively by draught oxen. More Red families than Christian families borrowed oxen for ploughing. Only one man interviewed had had his land ploughed by a Trust tractor. One exceptional man was the owner of a tractor which had cost him £450, but it was out of order and needed spare parts. The same man had been able to reap a crop of 12 bags of winter peas from a land which he had completely enclosed - probably one of the highest yields per acre recorded in the sample.

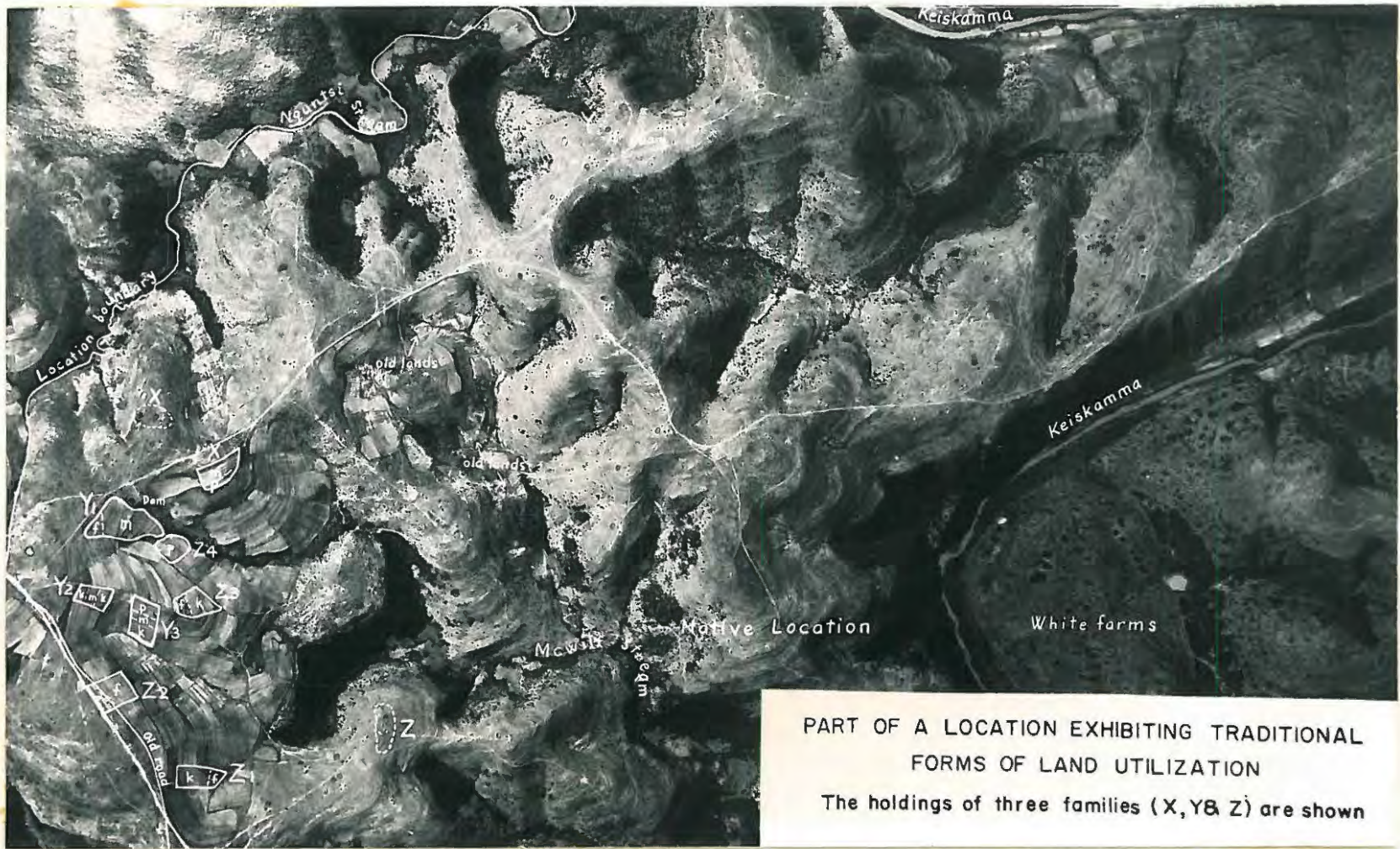
Hired labour is an almost negligible cost to Bantu farming. Friends and relatives commonly help one another to do ploughing, reaping or other work which has to be done relatively quickly. Sometimes help is given for part of a share-crop. Three Red families had hired labour at rates

varying from 5s. to 13s. an acre for hoeing. Only two Christians had hired labour. The traditional way of "hiring" labour is however by means of the ilima, where a gang of people work with every expectation of receiving a reward soon afterwards. The rewards often come in the form of beer-drinks, or less often involve the killing of a goat or the right to pick the amagashu (late-matured maize cobs). Amalima are usually organized for a specific task which the organizer has considered too difficult to do with his own labour resources. Such tasks may include ploughing, difficult weeding, or picking stones off the land. No Christian families held amalima but 6 of the Red and 3 of the half-Red families did. It did not appear to be a very common way of getting help at the time of the survey and in the area studied in detail.

Methods of cultivation among the Bantu farmers varied little as between classes of occupier. The gradual development of techniques employing modern equipment has not been accompanied by any great advances in modes of land utilization. Only two Red farmers admitted to ploughing up and down the slope. It is certainly more normal for lands to be ploughed along the contour. Most families either own or can easily borrow the implements used for ploughing and planting, although hoeing is generally done by hand. Most farmers sow maize with mealie planters. A few however sow

some crops broadcast - notably kaffir corn and peas.

Ideas of crop rotation are rudimentary. With the pressing need to produce as much staple food as possible - and this implies maize - there is little opportunity for growing fodder crops for mixed-breed scrub cattle and poor quality sheep. Rotations which are practised are most commonly two crops such as maize and kaffir corn alternatively. In at least three instances there was monoculture of maize. Occasionally maize or kaffir corn was rotated with pulses. Sometimes the same land grew peas in winter and maize in summer. Only one farmer said he had an annual rotation of crops. The farmers in Nonibe location, as distinct from those in other locations, were affected by the regulations which apply to proclaimed Betterment Areas. They were compelled to practise rotation of crops and many were going to plant lucerne next season. Manuring was practised by most of the farmers in the sample - only two Red families had never put dung on their land. The differences between the two main classes of farmer were not very great, but it was noticeable that the Christians had on the whole manured their lands more recently than the Red farmers. One of the Red farmers expressed the opinion that too much dung made the land "sour", explaining that this was why he did not often use his kraal manure in that way. Kraal manure is everywhere kept for fuel and "plastering" hut walls and floors.



PART OF A LOCATION EXHIBITING TRADITIONAL
FORMS OF LAND UTILIZATION
The holdings of three families (X, Y & Z) are shown

Its use as fuel has come about from the great shortage of firewood, especially in locations which are entirely on the ijojo, where there were never many trees. The traditional attitude to the supply of firewood in the bush is to use it whilst it is there - "I do not know why trees should be planted when there are forests" was a typical remark. The locations on the ijojo, such as Qugqwala, had traditionally made use of the forests in the locations nearer the Keiskamma river. Since the two areas had been separated by fences it was feared that firewood would have to be bought in future by those who had none of their own. Nevertheless the small use made of manure is not entirely due to the shortage of firewood. In the past, before the practice was stopped by the Native Affairs Department, manure used to be sold to neighbouring White (often German) farmers at 2s.6d. a load.

It is scarcely possible to make a study of the holdings of individual Bantu farmers without considering the land use of the locations within which they farm. Examples will be taken from a traditional, unsurveyed location, and an unsurveyed Betterment location and reference will be made to differences between them and a surveyed Betterment location where the influence of missionaries has been significant.

A portion of Khalana location (seen on the aerial photograph opposite page 275) has been selected to illustrate the most traditional type of farming in the Bantu areas. The

holdings of three families are marked, and their imizi are indicated. Two are Red (X and Z); the other is Christian. X has only one land; it is not registered in his name, but in the name of a previous occupant. This land has been enlarged by clearing surrounding bush and traditionally this would confer upon X the right of exclusive use³⁷. There were two acres of peas and four of maize in the land in 1957. He grew peas, pumpkins and tobacco in the small garden below the kraals. There are two kraals, one for cattle (ubuhlanti) and one for sheep, goats and calves (isibaya). Kraals can be distinguished throughout the location by the dark colour of the soil in them. This man was milking one cow, but most of the family's milk came from 6 to 7 goats. No crops were sold. Y has the use of three lands, which had a substantial proportion of kaffir corn in them. Maize and peas were also grown. Most of the maize was in land Y, which was controlled by the widow of Y's deceased brother and held in trust for her son. In practice this field and the others were cultivated by the children of both families. The two married women did not co-operate in cultivation and each had set up a separate umzi³⁸. Y had clearly acquired the use of an additional land which was vacant. Some crops were sold to local traders. In spite of there being two families in this group there were only 7 cattle and a herd of 60 goats; 30 sheep had been lost in

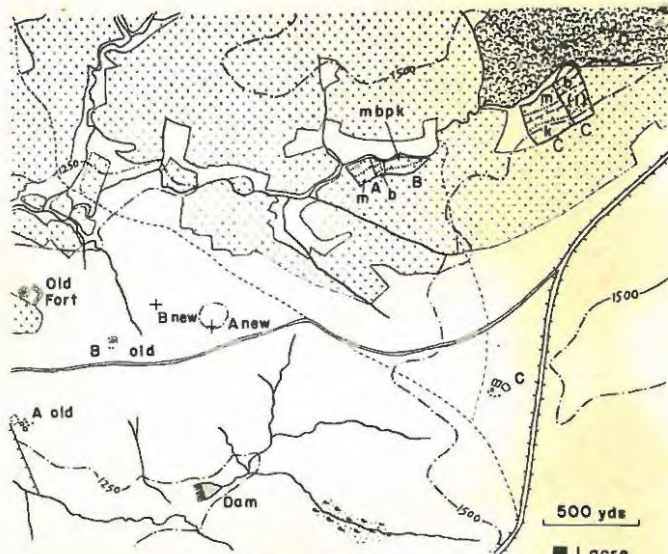
the drought of 1955. Z's lands are worked by a younger relative whose holdings are most probably included with Z's. One of these lands was described as a vacant one which had been obtained from the authorities. The garden of the umzi had not been planted. There had been a sizable crop of birdweed but the harvesting had been done by ilima and had been delayed, so that it was too late to plant maize as the summer crop. Z had a herd of 15 cattle and some 27 goats, but had not kept sheep since a flock he had bought in 1918 had died out from neglect. The one cow which was giving milk was receiving special green feed gathered from the veld by the children. A significant proportion of Z's income came from the sale of meat.

At the time of the survey the location of Nonibe was beginning to be farmed according to the regulations imposed by the Betterment schemes. Some of the farmers interviewed had had to move to newly allocated lands and were facing the prospect of some of their crops being chosen for them for the first time. For the first time not all the grazing was in use at once - two camps had been spared for the coming winter. They were in the isandle. No free grazing was to be allowed on the arable lands in that same season, and winter crops of cereals or fodder were to be grown in them instead. Some land was already being reserved for lucerne. One farmer said it would not now be necessary to cut maize stalks except

MAP 28



NONIBE LOCATION



A SECTION OF NONIBE LOCATION
SHOWING HOLDING OF 3 FAMILIES

KEY									
	ARABLE		TRACK		HUTS		KRAAL		m maize
	WOODLAND		NATIONAL ROAD		GARDENS		OLD GARDEN		b beans
	SCRUB		MINOR ROAD						p peas
									k kaffircorn
									(l) to be lucerne

for plough-oxen; there was plenty of grass now. A small plantation of Eucalyptus had been planted at the southern end of the location. There was some doubt in the minds of the local farmers as to its purpose. Some were apprehensive that they would be now expected to buy wood from the plantation rather than gather it freely from the forests as previously. The beginnings of an improvement in livestock husbandry were also noticed. There was talk of the introduction of Jersey and Afrikander cattle (made possible by controlled grazing). The dairy scheme which had been hindered by the 1956 drought was still not in operation in 1957. It had become possible, however, for some individuals to continue milking cattle for their own needs. Goats had been prohibited, and were bought in neighbouring locations for ceremonial purposes. x .

The position in one of the locations, previously in the Crown Reserve³⁹, was rather different, as there had been a longer period under the Betterment regulations and many of the old tribal sanctions had been taken over by a patriarchal headman and inkundla (council) who were deeply influenced by local missionary activities. For instance, tobacco growing, and sales of crops and firewood, are discouraged, if not prohibited, by the inkundla. They also control a number of social activities which now bear only a superficial resemblance to the traditional customs they have

replaced. Beer brewing is prohibited, and consequently there is little incentive to grow kaffir corn.

Annual quitrent payments are still made for arable land and residential lots, but to the Native Affairs Department instead of to the local Divisional Council. After the location was proclaimed a Betterment area some ten years ago, the arable land was re-allocated, but with little disturbance to the existing pattern of arable lands. A few of the former arable lots which were in unsuitable positions were excised from the arable area. Most villagers now have two six-acre lots. All except one of the inhabitants had moved their residences to the central village site which had been the original choice of the surveyors who laid out the location in the 1860's. The people had preferred to build huts on their own lands rather than close together in the village.

The communal dairy established as a result of the Betterment provisions has prospered in its eight years of existence: income from cream sold to the King William's Town creamery is approaching £500 a year. This is assisted by good management and the provision of 2 fodder plots, one of barley, kept solely for 60 milking cows, which were yielding in February, 1957, an average summer month, about half a gallon of milk a day each. The number of cattle is being reduced throughout the location; each family being permitted 16 in 1957, to be reduced to 10 the next year.

Only the cattle that had been culled were sold. In order to improve the dairy stock two Jersey bulls had been bought by the inkundla with financial assistance from the Government. Sheep are kept and are shorn annually, but goats are not allowed. Rotational grazing is practised and all livestock are kept out of the remaining sections of indigenous forest. In summer, periodic grazing of a Napier fodder plot supplements what is provided by the veld.

With the changes in traditional forms of husbandry being introduced as a result of Betterment, it seems that in the Border region there will eventually remain little of the traditional way of life which is today still essentially closely tied to farming and particularly to the keeping of cattle.

Keiskamma Bush

Apart from a few introductory remarks (p. 258) this sub-region has been discussed as if it were part of the larger Tribal Arable Upland. It owes some of its distinctiveness as a separate area, not only to a rather different land use pattern, but also ^{to} the fact that it is one of the last resorts of the traditional Xhosa way of life. These clans (Mdushani) resisted attempts to survey their land in the nineteenth century and have until very recently resisted the application of Betterment in their locations.

Izeleni Locations

There are several "enclaves" of Native reserve which are quite distinct from the main tribal area. These are

broadly similar in land use to that area and warrant attention only when there are striking or important differences between them. A group of locations and associated Released areas (Izeleni Locations) has been the scene of experiments with New Zealand hemp (Phormium tenax). It is hoped that the higher rainfall districts of the Bantu areas will adopt it as a cash crop, as a substitute for jute. It has been grown here on small pieces of land bought by the South African Native Trust⁴⁰.

Yellowwoods and other locations

The Yellowwoods valley locations probably contain the largest continuous area of flattish, alluvial and irrigable ground in the Border region. Development of these locations on the lines of an irrigation settlement ^{would} depends on a rather small quantity of water in the Yellowwoods River, and the transition from traditional agricultural practice to more soundly based husbandry, at first supporting fewer people. The lack of capital is a major factor inhibiting the development of irrigation anywhere in the Bantu areas.

The three locations in the eastern part of East London district were originally for the remaining and returning Xhosa people after the disaster of the Cattle Killing. They have, up to the time of the survey, resisted attempts to induce them to accept Betterment. Two of them, Newlands and Kwelera, which lie in the middle courses of large rivers,

occupy substantial tracts of flattish land which, to judge by the success attending such operations on nearby White farms, could be irrigated from river pools. Traditional farming, however, still contributes a quota of silt to the rivers. Mooiplaats location has a slightly higher proportion of arable land, probably because of its more favoured position on soils largely derived from dolerite, and from having about 35 inches of rain annually.

4. Chalumna Native Trust Agricultural Area

This region is unique in the survey area in that it has in association fairly large blocks of arable land and extensive fragments of forest included in a dominantly pastoral landscape. It is now a Bantu area and comprises the whole of Released areas 32 and 33. This is the one large stretch of land in the survey area which has reverted ~~back~~ to Bantu occupation after over eighty years of occupancy by Whites. That period obliterated the traces of its previous inhabitants, but the present holders have not erased the record of White farming from the landscape⁴¹. In some cases they have even made use of homesteads, farm boundary lines and roads. When the Trust took over the region from White farmers it would have been possible to substitute a completely different form of settlement and land use pattern. This has occurred only to a limited extent; the present pattern of land use at any rate is a development of the previous one. Some of the

arable land on the former farms has been retained, but in the main new, larger areas of arable land were needed for the new occupants; and to keep this arable land together, to avoid splitting up the remaining grazing veld, its location had to be moved to the flatter interfluves. Arable lands on the White farms had more often been on flatter patches of limited size in the river valleys, sheltered from the worst of the wind. Released Area 32 was transferred to Bantu occupation in 1937, and Area 33 by 1941. From then on land use has been more akin to that in the neighbouring tribal Bantu areas, rather than to the White farms to the east. There are however important differences between the Released areas and the tribal areas adjoining them. There is a striking difference in the appearance of the veld at the southern boundary of Twecu Location. The short grassveld of the location is in sharp contrast with the more varied vegetation cover of the Released area, whose woodland, scrub and better quality grassland is easily distinguishable in the field and is shown clearly on the map of vegetation at the scale of 1:125,000 which accompanies this volume. The Native Affairs Department is preserving the status quo by the strictest control over farming, the whole area being automatically considered a Betterment area.

The Released areas are organized into "settlements" or communal units, each of which has a predetermined number of "settlers" or families. This number has been calculated on

a basis of the productive capacity of the land, both for livestock and crop production. Each settlement has its residential area, arable areas and plantations laid out in the most suitable places according to local circumstances. The planners started with the advantage of not having to deal with an existing Bantu population, some of whom would become landless when the proposals to give the best farmers "economic units" were carried into effect. Each settler has 6 acres of land and is limited to keeping 10 cattle units: in fact there were neither sheep nor goats in this area. In spite of this restriction, Released Area 33 carries by far the highest number of cattle units to the acre in any Bantu area⁴² - such is the efficacy of controlled grazing. A three camp rotational grazing scheme prevails. Communal dairy schemes were introduced into the Released areas about 1950; and now each rural settlement has one. The best of them produce 20 gallons of cream a week. The separated milk is used by the community and roughly £5,000 worth of cream is converted into hard cash⁴³. Any livestock culled are sold and there are signs of increasing reliance being placed on the income from this source, from cream and the sale of separated milk. There should be a developing market for the latter with the the growth of rural townships, such as Cwebeni and others in the locality. With controlled grazing it is now possible to introduce specific breeds of

cattle. The emphasis has been on dairy breeds; the Brown Swiss or Siementhaler breeds now being preferred to ^{the} Jersey, whose calves are weaker and whose oxen are not as suitable for draught purposes^{43a}.

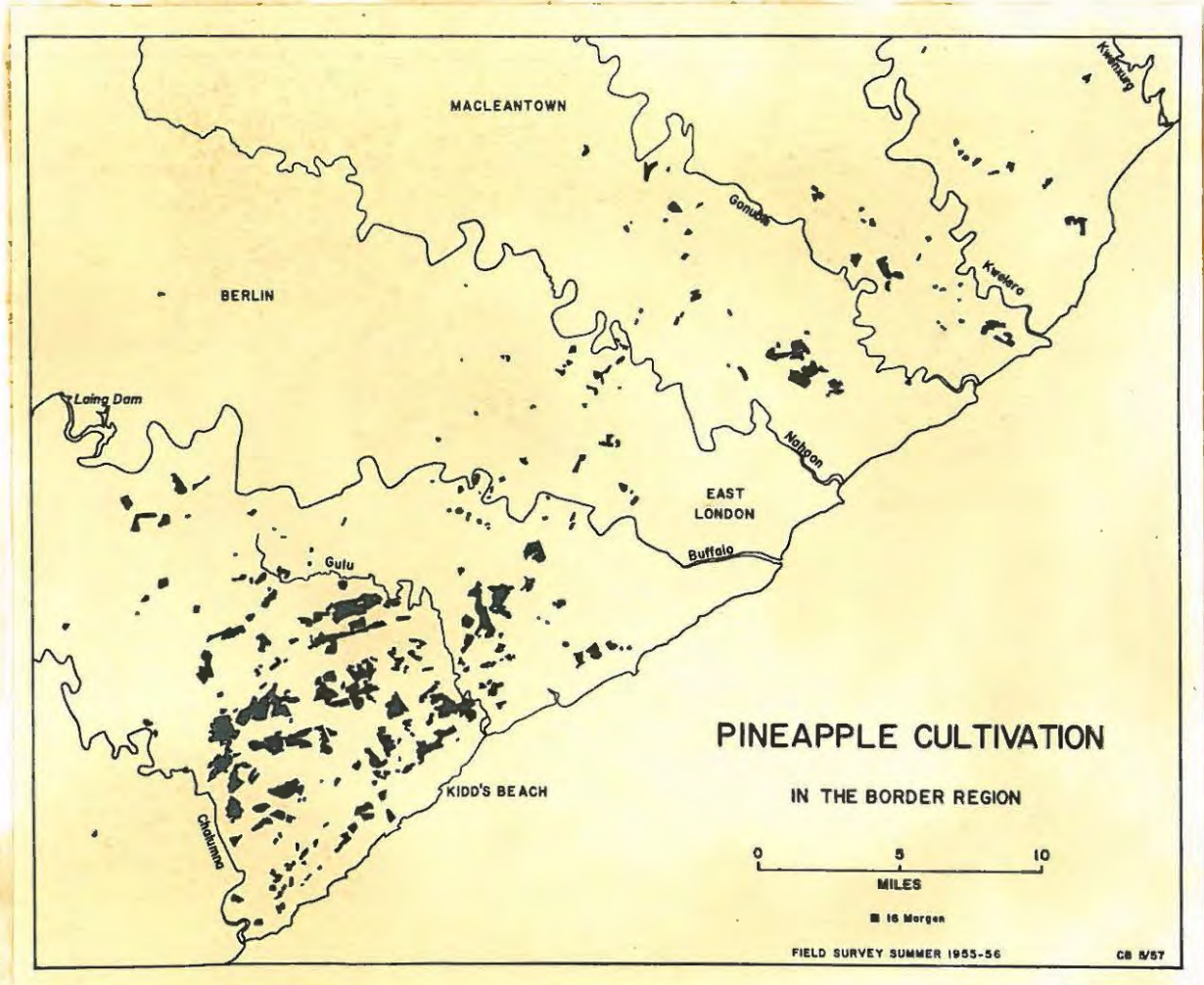
There are no separate statistics of crop production in the Released areas, but there is little to suggest that yields are very much higher there than in the locations. Bad seasons have affected both kinds of area. Some experiments have been carried out by the Native Affairs Department to see whether fibre crops and pineapples would be successful in this area. At the same time it is hoped that the Bantu themselves will become keen to grow these cash crops. Unfortunately Phormium tenax did not appear to respond well to the conditions near the coast⁴⁴. Until a bigger market for pineapples is created there would appear to be little hope of encouraging the Bantu to grow fruit which is already overproduced in areas close at hand⁴⁵.

Until recently almost all the resources available for the agricultural improvement of the Bantu areas of the East London district have been concentrated in Released Area 33. This applies particularly to plantations of exotic timber trees, 450 acres of which had been planted by 1957. The Native Affairs Department continue to preserve the coastal bush from exploitation.

5. The Pineapple Belt

West of East London's airport extends a region of great distinctiveness. Nearly 25 per cent of the land is under cultivation and over half of this is devoted to pineapples. At the time of the survey a considerable proportion of the rest of the arable land had been prepared for pineapples. Very few other crops are grown - maize is the next most common. Before the second world war this was a mixed farming area and provided East London with much of its fresh milk. Peculiar economic circumstances, resulting largely from the war and its aftermath, created conditions under which the cultivation of pineapples became extremely profitable: these have since altered and have thus jeopardized the basis of much of the intensive development of the region⁴⁶. In relation to other types of farming in the survey area, this is intensive from the point of view of labour employed, capital invested and capital turn-over. The region is virtually practising monoculture, having exploited its slender natural advantages over nearby regions, and dependence on the one cash crop has, in a period of falling prices, placed the farming population and those dependent on them in a severe predicament⁴⁷.

Arable land for pineapples commonly occurs in large blocks up to several hundred acres in extent. These may cross farm boundaries as they are related chiefly to the



flatter interfluves and valley slopes and to bands of deeper, better-drained dolerite soils. The valleys, being less accessible from ridge-top roads, have almost no pineapple cultivation. Arable land in the valleys is generally used for maize or occasionally for fodder crops. Sometimes the arable land of the valley floors is worked by the permanent labour force. More commonly there is insufficient land for labourers to have lands for their own crops. Much woodland has been cleared in preparing land for pineapples ("bush soil" is considered to be very suitable for them), but there still remains much woodland in the deeper valleys away from the main roads. Although over 90 per cent of the farm income comes from arable land, the intervening veld is by no means unimportant to the general economy. When it is possible to grant grazing rights for cattle it is easier to acquire and keep a contented labour force.

Pineapples were at first almost entirely restricted to the outcrops of dolerite with their red or chocolate soils. It is claimed that these soils erode less easily and that plants in them bear fruit satisfactorily for two years longer than in other soils. Their deeper profiles⁴⁸ give them an advantage over the shallow and less freely draining grey, sandy soils. On the latter, planting diagonally to the contours combats the tendency to waterlogging. In some valleys a rise in the water-table, presumably as a result of

the continued occupation of the soil by pineapples, has had the effect of making the lower parts too waterlogged for pineapples⁴⁹. Whereas the earlier development of pineapple cultivation took place on the most favourable soil, the extension at the time of the boom⁵⁰ frequently took place on the less favourable grey soils on sedimentary rocks and the very light, sandy soils of the stretch just behind the dune belt. The danger from blowing sand, which whitens the leaves of the plants, is partially overcome by wind-breaks.

The work of preparing a farm for large-scale pineapple cultivation involves much time, expenditure and technical skill, especially if the intention is to take advantage of a particularly favourable market. The financial returns are delayed by the eighteen months to two years which it takes for the plants to bear fruit. Much of the early development of the industry has had to contend with a lack of all but empirical knowledge of the best types of fruit required by the market and of the long term effects of pineapple cultivation on the soil⁵¹. Unless land already under crops is used, virgin veld has to be ploughed or bush has to be cleared by tree-felling and stump-pulling. Often heavy machinery is required for this, and many farmers have thought it worth while to employ a contractor to carry out that side of the work. Others, however, attracted by the prospect of high returns, have bought their own

PLATE 20



Pineapple cultivation near the Ncera River valley (Farms 69 and 67). The lay-out of an established plantation of Cayenne pineapples is seen on the left middle distance. Land newly prepared for planting occupies the foreground. The bush has been cleared, leaving only a small strip next to the tributary gully.

machinery - track-laying tractors, bulldozers and special ploughs. Once cleared, the land has to be contoured to protect the clean-cultivated soil from erosion, and access roads and storm-water furrows have to be provided. In the windier, coastal areas it is advisable to plant wind-breaks of sugar-cane or Napier fodder. Pineapples are usually raised from ~~tops or suckers and~~ benefit from fertilizers in the early stages of growth. At the time of fastest development of the industry (1954-7) planting material was extremely expensive and difficult to obtain. Some farmers planted tops or suckers from their original fully-grown fruits, if they had any; and this impeded development and meant that even those who had not spent so much on preparation were not reaping much fruit until prices had begun to fall.

There are between about 10,000 and 15,000 plants to the acre, depending mostly on the type of fruit being grown⁵². Most of the new developments in the industry in the survey area have been achieved with the smooth cayenne variety. It has a heavier fruit, giving less wastage in preparation for canning. The queen variety, which was formerly preferred for export as fresh fruit, is no longer so extensively grown. There are usually more cayenne plants to the acre, as they are planted in double rows so that the greater weight of fruit may be more easily supported by the neighbouring plants. Until recently most of the work of

planting, cultivating and weeding has been done by manual labour. As the fruit does not all ripen at the same time, it has to be picked by hand. Machinery has been developed which will weed between the rows of plants, and also to shred old plants when they are considered not to yield sufficiently well. Semi-mechanized cultivation with a device drawn by mules and oxen had not been successful because the plants had been damaged in the process. The new, small but powerful tractor, fitted with a plant deflecting device, was tried in the field in 1956. It was claimed that it would weed $1\frac{1}{4}$ million pineapples in a week, four times more quickly than the job could be done by 28 Native labourers⁵³. The introduction of such machinery would no doubt save labour costs, but it is doubtful whether at the present stage of the industry it would be considered economic if a large labour force is needed for other operations. Many pineapple farmers have a large number of Bantu families residing on the farm and providing both monthly (permanent) and daily (casual) labour. Some nevertheless still find it preferable or necessary to fetch truck-loads of women from the rural locations to work on the lands from Monday to Friday. These women are usually employed in the harvesting seasons when fruit picking, carrying and sometimes packing have to be done in addition to the normal work. The need for large numbers of labourers in pineapple farming has had

multiple repercussions. Firstly, at the time of greatest expansion of cultivation, there was a shortage of labour, which resulted in the raising of wage rates on pineapple farms to the disadvantage of farmers on other farms, who found it more difficult to obtain labour at the old wage levels. There has also been a shortage of labour on pineapple farms; there is a limit to the number of labourers who can be attracted away from the traditional way of life in the Bantu areas to work consistently for a set number of hours on White farms. Secondly the increase in the labour force on pineapple farms has led to a modification of the traditional system of rewards and perquisites for working on the farm. In order to attract sufficient numbers of permanent labourers, grazing rights are granted to each family, but there is not enough land to provide arable land for each family to grow a little maize or tobacco. The White farmers rarely combine cattle farming with pineapple farming on the same holding, and so tend to neglect the condition of the veld, which is almost exclusively utilized by Native cattle. Some control is achieved by limiting numbers of cattle to ten or twelve per family. But in some parts soil erosion in the veld is more serious than in the arable lands, even under clean cultivation.

While the production of pineapple in the East London district has doubled in six years, 1950 to 1956 (and this

chiefly by an expansion incultivation), there has been difficulty in disposing of the fruit on the market⁵⁴. The current problems of the industry arise out of that consideration. So far, regional specialization in pineapple production has been achieved in the Albany-Bathurst and East London areas at the price of much uneconomic development: there is even talk of a return to more mixed farming. It is nevertheless certain that the boom, while it lasted, brought a much more efficient kind of crop farming to the Border area and that the more soundly based concerns will remain and increase their share of the market. The effects of changing markets on the industry are discussed in Economic Development in a Plural Society, Chapter 3. Two other major aspects - seasonality of production and difficulties arising from the bulk and perishability of the fruit - are linked with other factors and vary from region to region.

It would be a gross over-simplification merely to assert that the peak production of fruit occurs in the summer. Queen pineapples (mainly for export) ripened earlier than cayennes, but not early enough to be able to supply all the needs of the market overseas before Christmas. Fortunately there is some production of fruit the year round, with a secondary peak in the late ~~winter, of the northern hemisphere.~~

Table 42

MONTHLY VARIATIONS IN PRODUCTION OF PINEAPPLES, 1956

On one estate near East London

<u>Yield in</u> <u>tons</u>	<u>Jan.</u>	<u>Feb.</u>	<u>Mar.</u>	<u>Apr.</u>	<u>May</u>	<u>Jun.</u>	<u>Jul.</u>	<u>Aug.</u>	<u>Sep.</u>	<u>Oct.</u>	<u>Nov.</u>	<u>Dec.</u>
Queens	254	63	32	-	12	77	85	20	14	128	66*	23
Cayennes	22	243	230	68	19	9	23	100	22	31	229*	157

- none; *extensive damage from sunburn, November 7th.

Hot spells of weather can of course bring on the ripening and can occasionally cause serious loss through sunburn, as in February 1955, when the damage to fruit caused a significant drop in the Union's exports and a corresponding increase in the amount of sub-standard fruit sold in domestic markets. Peaks in production, particularly in February and March, have had to be specially catered for by the South African Railways. As the fruit bruises easily and deteriorates rapidly when ripe enough for canning, it was vitally important that rapid transport be available when the fruit had to be sent from the Border Region to Port Elizabeth for canning. Farmers, who contracted to supply firms in Port Elizabeth can now send their fruit to two canneries, recently opened in East London. Thus growers no longer have to rely either

on rail or road-motor transport for their fruit to be taken to Port Elizabeth or on a number of smaller canneries. These latter were generally willing to take as much fruit as they could get for inflated prices in slack periods, but were relatively easily oversupplied. Little use seems to have been made of the knowledge that the flowering and hence the ripening periods of pineapples can be brought forward by using certain chemicals⁵⁵. Without a large horticultural industry in the Border, canneries have not easily obtained other fruit or vegetables to process out of seasons. Guavas are most readily available; and fortunately they have an extended harvesting period, which is somewhat later than the peak of the pineapple harvest.

It is ~~estimated~~ estimated that from 20 to 40 per cent only of the pineapple fruit is utilized in canning; the rest is waste. It is clearly advantageous for the growers to have access to a cannery near their farms. Development in some more remote areas such as Zululand has been markedly stimulated by the provision of a local cannery, which in turn has to be assured of a sufficient supply of fruit in season. The same is true of Northern Queensland where development awaits the construction of a cannery and where the only market is at present the Australian market for fresh fruit⁵⁶. When the market for fresh fruit is as limited as it is in the Union, the canneries exercise more than a stabilising influence.

Fortunately the Union, unlike Australia, is able to compete successfully for the overseas fresh fruit market. Fresh fruit production needs more skilled attention to marketing than does production for canning; but the former is less concerned with the problems created by the bulk of the fruit, and rather more about its perishability. The Border is now well served by canneries; there are five⁵⁷ in East London and one in the centre of the Pineapple Belt itself, at the western end of Farm 60. (The problem in being far from East London is the lack of services such as mains for electricity and water.) This local factory is only just off the end of the tarred road to East London and is thus well connected with most of the main producing area except that west of the Keiskamma River. In spite of being in the middle of the Pineapple Belt, this factory buys fruit from most districts between Komgha and Grahamstown as it ripens progressively southwards. At first the new factory experienced a shortage of suitable labour and had to employ labour accustomed to factory work in East London; later, "raw" local Bantu women were trained to do the routine work.

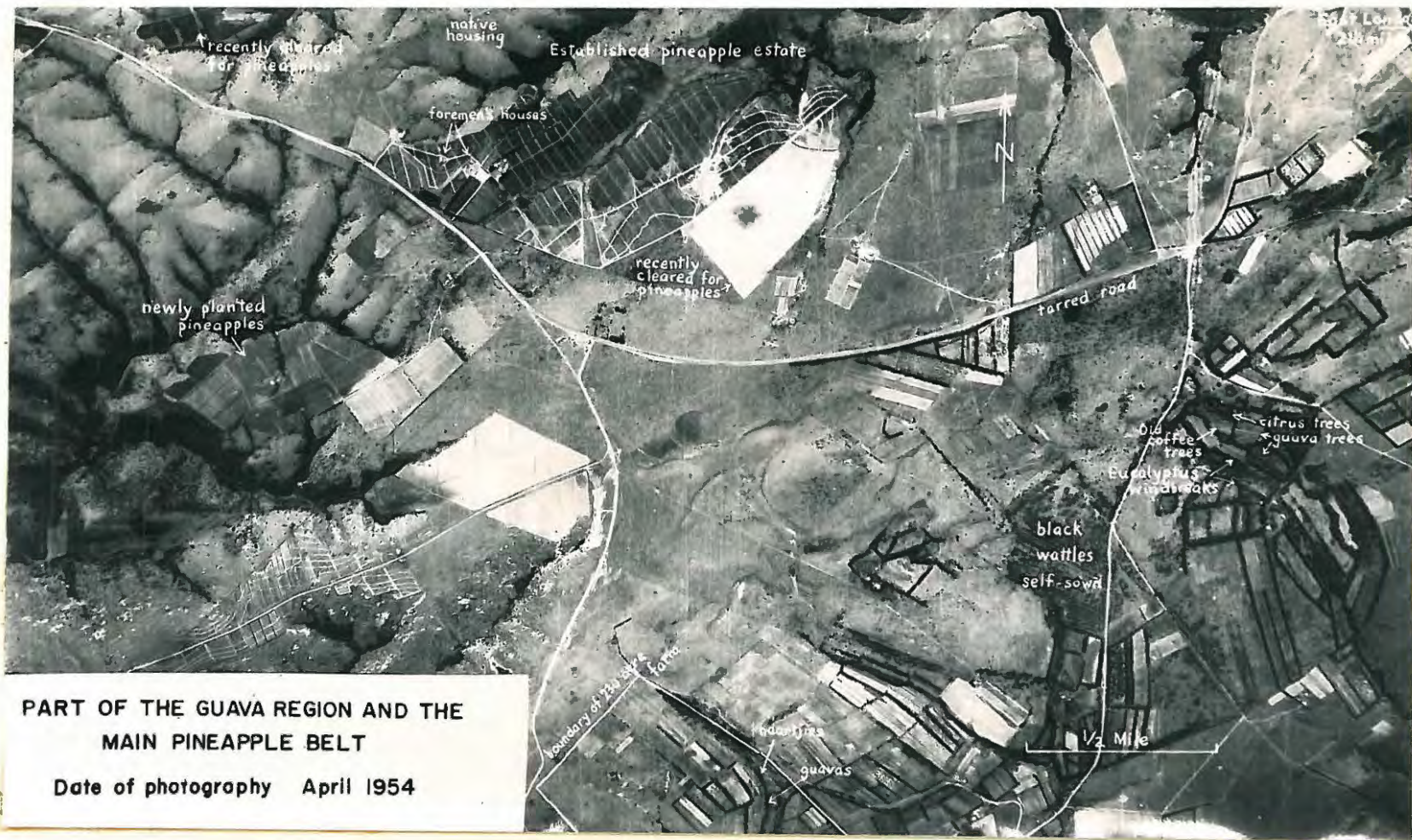
Little use so far has been made of pineapple waste, but there have been experiments to see if it can be employed as a base for cattle food⁵⁸, and also investigations into the possibility of using the leaves of the fruit for fibre, as, unlike stokroos, (*Hibiscus cannabinus*), it does not have to

be mixed with jute to render it suitable⁵⁹.

Although the destination of pineapples grown in different regions of production is not known, the national position is better documented. Over two-thirds of the crop is now canned and under 20 per cent of this is consumed locally⁶⁰. When the percentage canned is lower, as when sun-burn has affected the crop (1955-6), the amount sold on the internal markets as fresh fruit is higher and no doubt includes much second grade fruit. In general the proportion of fruit exported fresh has tended to decline to just over 2 per cent, from a peak of just under 10 per cent in 1952-3. This may be expected to increase as the improvement of shipping facilities proceeds. The main outlet remains the canned fruit for export⁶¹.

Pineapple farms are of several kinds, as was suggested elsewhere⁶². Many of the farms in the coastal belt grow pineapples as well as other crops, besides engaging in livestock farming; but they are more commonly the smaller farms (under 500 acres). Then there is a category of medium size farms which were considered typical of specialization in pineapples; they too are described elsewhere⁶². Occasionally an amalgamation of properties has taken place and an estate of two or three thousand acres has been created to produce pineapples on plantation lines supervised by a resident manager acting for a company or syndicate. At the time of

the survey, many of the large estates were being developed and were not in full production, nor were they fully planted with pineapples. One such estate, with 6¼ million plants on about 600 acres of a total of 2,500 acres, was producing nearly 2,000 short tons of pineapples in a season. Two-thirds of the plants were of the cayenne variety, which was in demand by one of the larger canning firms; the rest were the queen variety, some of which were taken by the cannery, others being exported fresh and some sold at premium prices to travellers at a road-side stall. It was noticed that the larger estates tended to concentrate more on growing the cayenne variety because it was preferred by the canneries. Recent moves by the industry to introduce careful grading for canning fruit have reinforced this tendency. As much of the land had recently been virgin veld, problems of declining fertility were not noticeable here. Some 8,000 banana trees had been planted as a speculative side-line; but they were not yet bearing. Although this estate was highly mechanized, with four tractors, three 5-ton lorries and a bulldozer, some 150 Bantu labourers were regularly employed. About 200 altogether were needed at the peak seasons. There were four White foremen in addition to the resident manager. They and the permanent labour force of Bantu lived on the property in housing provided by the company. The Bantu labourers who were on a permanent basis



PART OF THE GUAVA REGION AND THE
MAIN PINEAPPLE BELT

Date of photography April 1954

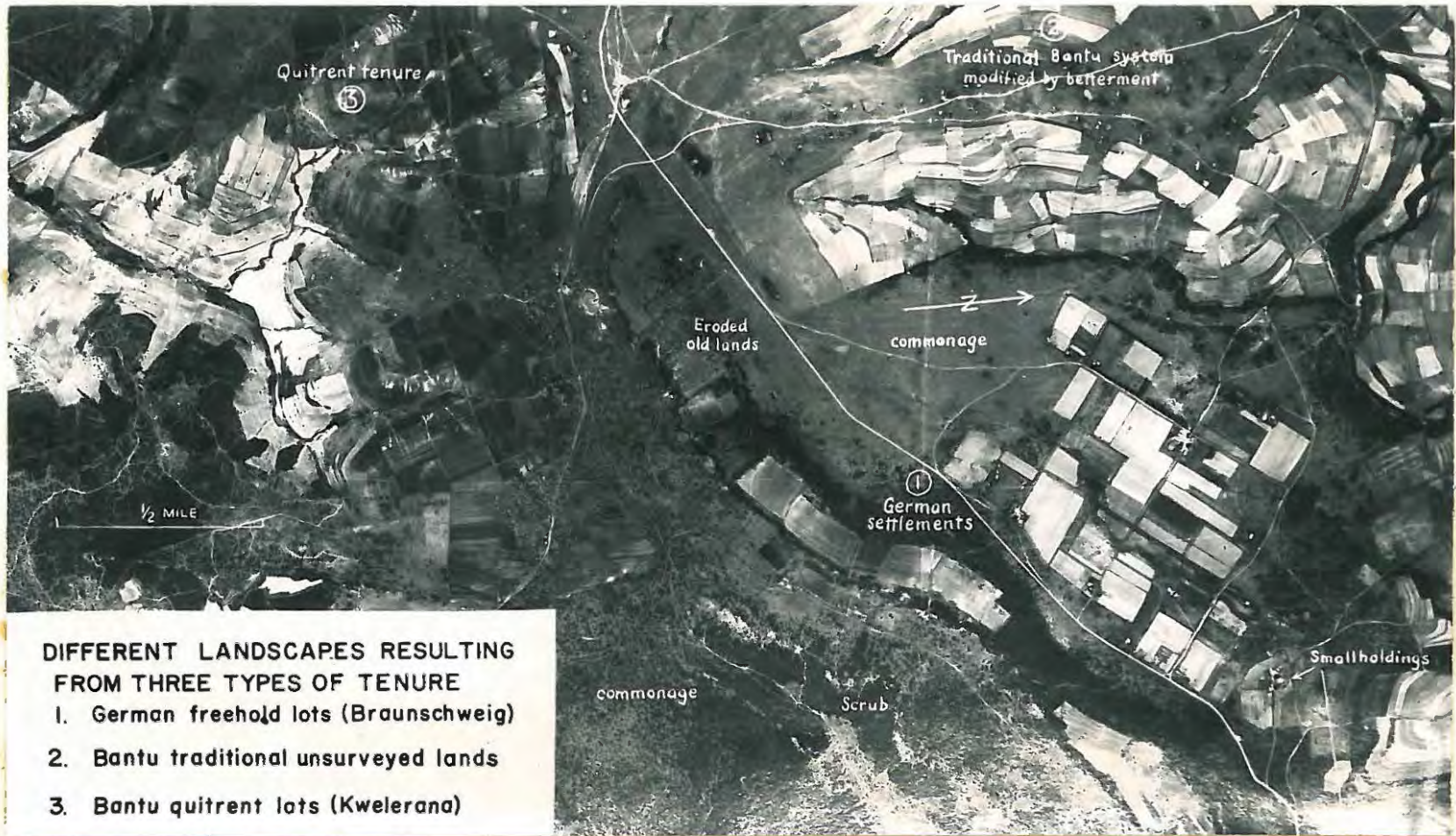
kept about 150 head of cattle on a block of grazing land which was reserved for that purpose, as it was off the doleritic soils which were kept for pineapples. No farm labourers were allowed to cultivate arable plots.

An important sub-division of the Pineapple Belt may be recognized to the south-west along the coast: it is the Guava Region. Here the farms are smaller than further inland and pineapples are no longer the main farming enterprise. Their place is generally taken by top fruit, usually guavas or citrus fruits. The orchards are protected by wind-breaks of Eucalyptus trees, most of which were planted over a quarter of a century ago. The only field crops of consequence are pineapples, grown for canning, and maize, grown either for supplying Native labour with rations of mealie-meal or for cattle feed. When some veld has to be reserved by the farmer for his own and his servants' cattle there is little room for extensive cultivation. A few farmers have experimented with pasture crops to supplement winter feed.

One such farm is a portion of a larger property and now covers 230 acres. There are 15 acres of orchards (2,000 guava trees and 500 naartjies). Part of the guava orchard is irrigated by furrows from a borehole yielding 300 gallons an hour. There were 12 acres of dryland crops in 1957, half of which were under pineapples. The rest was two-thirds maize and one-third tomatoes, but the latter had suffered from

"black spot" and had not yielded a commercial crop. Pineapples were sold to a cannery in East London, but the guavas and naartjies were sold fresh on the markets at East London, Grahamstown and Queenstown. There was also half an acre of "ronpha" grass pasture. This farm carried about 50 head of cattle (15 belonging to Bantu farm labourers), but no dairy produce was sold. The farm was largely self-sufficient in milk, butter, and cream, and in separated milk for the labour force. The farmer managed to do without occasional labour by employing "full-time" four men, three women and a youth, in addition to the help given by his two sons. Mechanization was at a low level, there being only the bare essentials of machinery and implements, including a car, truck, tractor and an engine for pumping water.

Another sub-division of the Pineapple Belt depends for its distinctiveness on the lack of pineapple cultivation in that particular area - the Gulu Bush. This occupies the deepest valley crossing the main belt and has remained largely unaffected by pineapple cultivation because of its steepness and inaccessibility. Only one road crosses the middle of the valley. This does not prevent farms which stretch down into the valley from exploiting the extensive reserves of indigenous timber for building and firewood for their labourers.



6. German Settlements

The four areas of German settlement which can be identified on the map of land use regions, Mngqesha, Izeli-Frankfort, Hanover-Berlin and Potsdam, are not so readily distinguished on the land use map. They are rather similar to the tribal area already discussed, but it is possible to draw attention to some significant differences in land usage. These settlements occupy very much the same kind of country as the tribal areas and so a direct comparison of the methods of utilization and their results may be made. Although large tracts of the German settlements are relatively clear of bush and scrub, in places there are thickets of thorny scrub up to the fences dividing the settlements from the locations (see the aerial photograph opposite p. 301). The descendants of the German settlers have, by virtue of superior techniques and resources, been able to make their areas more productive than the neighbouring tribal areas.

These two types of land use region may be distinguished in three main ways. German settlements have less arable land than the tribal areas; the individual blocks of arable land are always angular, having been surveyed; and land use is more varied, there being orchards, gardens, pastures and plantations scattered among the arable lots. About 20 per cent of the total area of the settlements is arable and there is a greater range of crops grown. As the arable lots are

enclosed and are not grazed in winter, winter crops are planted more frequently than in the tribal areas. It is also possible to draw a distinction between the settlement patterns of the two types of area, for there are "permanent" villages laid out by surveyors in the German settlements and none in the tribal areas. These differences apply, however, with less force to the few locations in the tribal areas which were surveyed for individual, quitrent or freehold tenure. In these cases a superficial resemblance exists only because the arable lots have an angular shape; but ^{they have} a very different role in the agricultural economy of the two areas.

In each of the areas of German settlement arable land occupies rectilinear patches, sometimes up to a couple of square miles in extent, each patch being composed of a number of either four acres or one acre oblong lots. It has sometimes proved possible for farmers to enlarge their original holdings by buying additional lots next to the first ones, (in which case they are often ^{all} enclosed by a ring-fence), or some distance away. In order to survey the arable lots quickly they were arranged in this fashion and as a result they covered ground that was not the most suitable for cultivation. Thus within the pattern of oblong lots there are frequently patches which are not cultivated. This is the explanation of the ragged outline of the arable land east of Frankfort and south-west of Wiesbaden. The individual lots often carry

strips of different crops, reminiscent of parts of present-day Germany. Sometimes the more unsuitable land is planted with black wattles or is left as a small paddock. This supplies grass for bedding in the byres, or provides an enclosed piece of grazing for special livestock. Otherwise all grazing is communal, enabling the relatively low carrying capacity to be utilized to maximum advantage and ensuring that everyone's livestock has a choice of the full range of qualities of grazing in the locality. This enabled a larger number of people to be settled closely on the land in defensive nuclei⁶³ by providing what was thought to be sufficient arable land and the use of a very large tract of veld. It is doubtful whether individual farms, each with an appropriate amount of grazing not in common, would have survived for long. Land speculators would long ago have bought up arable lots from the less enthusiastic farmers if there had not been regulations limiting the number of livestock which could be run on the commonage. The limit is usually 40 head per landowner entitled to common rights. Broad regulations of this kind have controlled the utilization of the land in the German settlements since local government was extended to them in the latter half of the 19th century. The coming of soil conservation farming has led to one of the commonages being subdivided into a number of grazing camps so that rotational grazing may be practised. It is significant to

note that this one - Berlin - includes many dairy farms supplying East London with fresh milk. Orchards and gardens are usually associated intimately with the farmsteads, which are nearly always on the individually held lots (or occasionally "squattling" on the commonage just off the lots). Woodland, where it occurs as forest on the commonage, is subject to controlled utilization especially as to the amount of firewood cut⁶⁴.

Most of the farmers in the German Settlements could be regarded as peasant farmers living at about the subsistence level. Most farms are (without commonage) smaller than 100 acres. Although the dairy farmers in the German settlements of Berlin and Potsdam are favourably placed in relation to the main road and railway for supplying East London, only those with sufficient skill and capital have taken up dairying. This class is by no means confined to the descendants of the original immigrants. Yet another type of farming may be recognized in the upper Buffalo valley. Here at Izeli and Brannschweig, as a result of the introduction of capital by outsiders who have bought lots in the settlements, and also by the more enterprising heirs of the German immigrants, a more intensive type of farming obtains. Dairy farming is popular but vegetable and top fruit growing, with the aid of irrigation from the Buffalo river, are also important. On the dairy farms the arable lots are frequently planted with

lucerne or lucerne/clover/grass pastures, which are regularly irrigated. The same conditions of land tenure apply here, and so all intensive development has to take place on the individually held lots. Often the commonage is scarcely used by the more progressive farmers, especially those who run pedigree stock, which naturally have to be herded separately. In general the pressure on grazing rights is so constant that Native labourers are rarely allowed to keep their own cattle on the commonage as part of the allowance of their employers, and the lots are rarely big enough for them to be given more than a small garden near their kraals.⁶⁵ If rations are not provided by the farmer for his Bantu labourers he has to pay them higher cash wages, or accept their help on a part-time basis in exchange for allowing them to live on his farm.

The general type of farming which prevails elsewhere on the German settlements is of mixed character. The most important enterprise is livestock - cattle and sheep. The sale of cream contributes most to the cash income whilst milk, butter and cheese supply the family. Sometimes cash crops are grown, but they are more often intended for supplying labour with rations (maize, beans) or for stock feed. Most of the farms of general type are badly situated in relation to a supply of water for irrigation.

The examples of farms have been chosen to represent the different types mentioned above. A holding near Frankfort

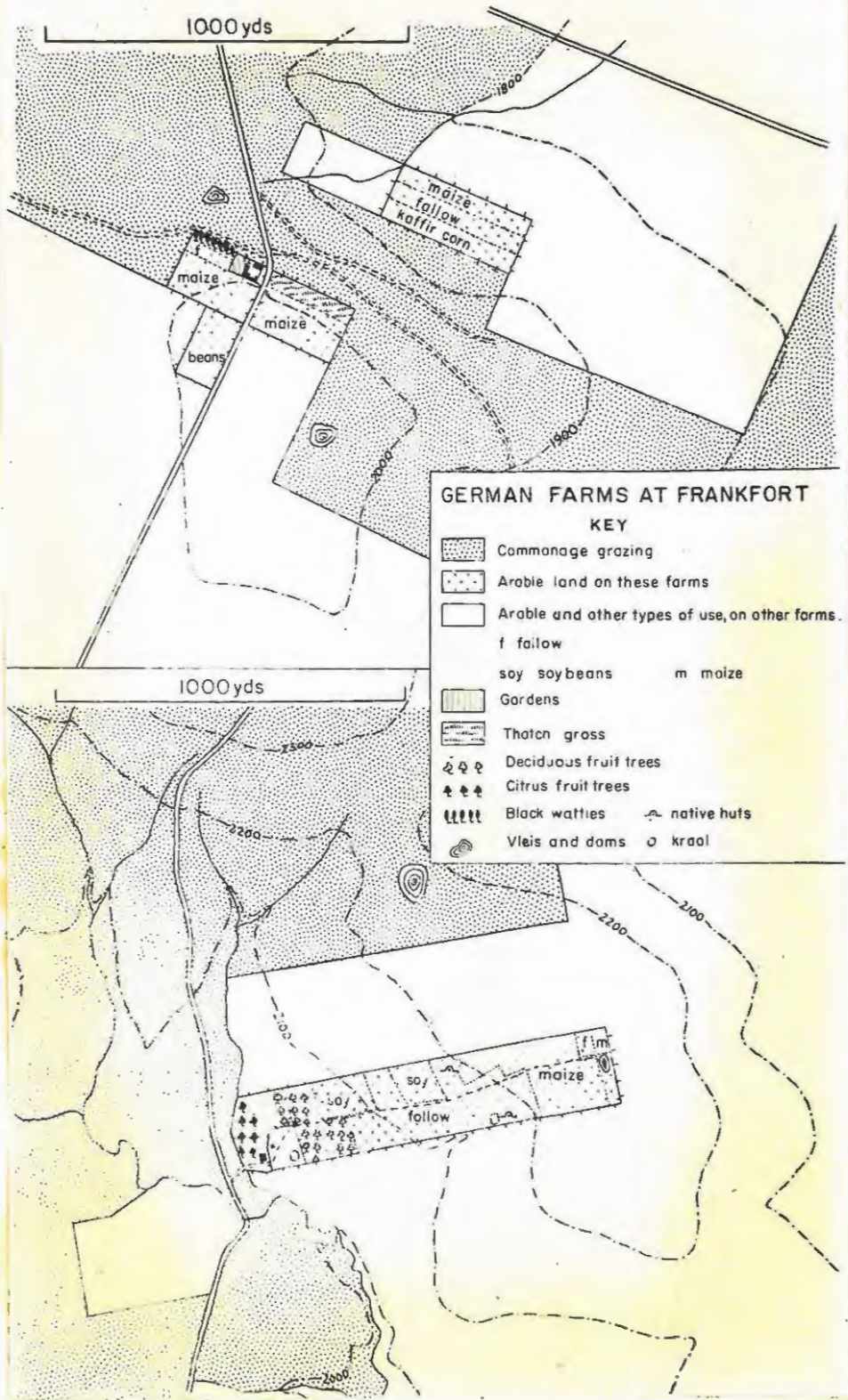
PLATE 23



Outbuildings of a German farmstead at Frankfort. The sod walls are part of the original dwelling house. The galvanized iron roof is relatively new and the garage is a recent addition. A corner of the cattle kraal in right foreground.

was selected to illustrate the kind of peasant farm which is representative of the group at about the subsistence level. In all the arable lots amounted to 29 acres and were in three separate blocks, two of which were divided by a public road, the other one being a half mile away. Most of these were under cultivation; a small piece of fallow grew thatch grass, occasionally sold to natives. There was a small strip of wattles which provided a little cash from the bark, and some firewood. Maize covered 15 acres; beans and kaffir corn were next in importance. These crops were grown principally for feeding the two Bantu families who worked on the farm, and only the surplus was sold. A yield of 40 bags of maize was expected in 1956. The Native labourers had about an acre on which to grow their own maize, but were not allowed to keep any stock. This farmer kept about 30 cattle, including a team of 10 oxen with which all ploughing was done. They were kraaled every night and the kraal-manure was spread on the lands each year. The cattle were put out on the grassy headlands and on the stalks after the harvest. There were no winter crops at the time of the survey, but a small strip had been prepared for lucerne. The only implements were a two-furrow plough, a waggon and a sledge. The condition of the farm buildings (see photograph) was poor; some of the outside walls were made of sods from the veld. The domestic water supply was caught on the roof. Water for

MAP 30



GERMAN FARMS AT FRANKFORT

KEY

- Commonage grazing
- Arable land on these farms
- Arable and other types of use, on other farms.
- f fallow
- soy soybeans
- m maize
- Gardens
- Thatch grass
- Deciduous fruit trees
- Citrus fruit trees
- Black watties
- native huts
- Vleis and dams
- kraal

livestock and farm labourers came from a dam near the farmstead.

The second example is a farm of 50 acres, also near Frankfort. It is being developed as a mixed, intensive farm. There is a good source of water (850 gals. per hour) provided by a borehole from which the lower end of the farm is irrigated. This holding is situated on a west-facing slope adjacent to a public road leading to King William's Town (14 miles distant) and to the nearest station (Peelton, 7 miles distant). The main enterprises are vegetable and fruit growing and cream production for sale. The field crops grown - maize and soybeans - are principally for stock feed. About 3 acres of lucerne are cut for feed. Oats are also grown as a winter crop and are grazed off by the cattle. What grain is harvested is kept for seed. There were in 1957 three small orchards of guavas, peaches and quinces, but these were not a success. Irrigated citrus trees surrounded by a vegetable garden were more successful. Potatoes, beetroot, carrots, pumpkins and cabbage are marketed at King William's Town, or, at times when that market is glutted, at East London or Queenstown (sent by rail).

The herd of 20 cattle included 7 cows together yielding 3 gallons of cream a week, sold at the creamery in King William's Town. Goats and poultry were also kept - goats providing supplementary milk and meat for the household. Eggs and table birds were sold on the market along with a little

butter. Separated milk was retained for the Bantu families on the farm. They were allowed to keep up to four head of cattle per family. This helped to attract the labour needed for tending the vegetable garden and orchard. A pedigree bull and a Clydesdale-Percheron work horse were kept in paddocks on the holding. Some 20 acres of the farm were uncultivated and provided a little extra, private grazing, and additionally room for two Native kraals with gardens attached. Two Bantu families normally provided the labour force, and seasonal labour was obtained by paying Bantu women piecework rates with a daily allowance of mealie-meal.

The level of mechanization was fairly high, but as with most of the German farmers a car is a luxury which they cannot afford. One tractor, an engine and a truck for marketing made up the motive power on the farm. Development has been financed by mortgages and is now proceeding on the lines laid down by the requirements of conservation farming. The arable lands have been contoured and more land will be put down to lucerne which will be irrigated, possibly from the second borehole (2,150 gals. an hour). Apart from using fertilisers and sprays, this farmer is buying extra manure from neighbours.

7. The Nahoon-Gonubie and Quru Agricultural Regions

These two regions, from an examination of their land use pattern, may be classed as agricultural rather than

pastoral. One has rather more land under cultivation than the other, but in several respects they are similar. The types of farming found within these regions are rather varied and can only be called "mixed" - comprising some cash crops and some livestock produce. There are two predominant groups of farm sizes: one in the small range between 100 and 500 acres and the other generally between 500 and 1,500 acres. The smaller the farms, the greater number of enterprises are found on single farms. It is more than coincidence that the smaller, mixed farms are nearer the coast. For this reason the region next to the coast will be dealt with separately.

a) Nahoon-Gonubie Agricultural Region

This region lies north of the Buffalo River and athwart the valleys of the Nahoon and Gonubie (Gqunube) Rivers, some ten to twenty miles inland. It is more elevated but less exposed, and more humid, than the coastal area. From 10 to 14 per cent of the land is under cultivation. Arable land occurs in small patches in the more suitable parts of the individual farms. It will be seen that a farm boundary often limits the extent of a tract of arable land. Arable land is found in two characteristic situations: either along the floor of a fairly open valley as in the Igabe, Mpongo and Kwelera valleys; or along the watersheds near good roads, as between farms 168 and 174. Where the farms are smaller - north and west of Macleantown and east of Kwelera location -

the necessity for each farm to have a certain proportion of cropland means that more arable land is located away from those situations but is scattered widely over the flatter slopes. The block of arable lots around the village of Macleantown is an exception in this region. It is more akin to the German settlements in its associated forms of land utilization. It is surrounded by an almost treeless commonage, the grazing rights of which are regularly extended to neighbouring farmers, who pay for them⁶⁶. For the rest of the region grazing is all controlled by individual occupiers. Soil conservation practices have not yet extended to this region except for one or two farms individually proclaimed. There are several areas where woodland locally amounts to between 3 and 5 per cent of the land surface. These are the parts with greater relief: the Gonubie valley, the middle Nahoon River valley and the Ngcweba River valley. Most of this woodland is indigenous forest. Towards the watershed between the Nahoon and the Buffalo rivers there is a greater diversity of land use. There are several orchards and established pastures in the belt of farms which have easy access to the National Road and railway between East London and King William's Town. It is this group of farms which has specialized in fresh milk production⁶⁷. Many of the dairy farms are smaller than those concentrating on the production of cash crops and marketing of cream and fat

stock, which is more typical of the region as a whole.⁶⁸ Pineapple cultivation had not, at the time of the survey, made much impression on the landscape or the economy except at places within a mile or two of the National Road or the tarred road from Abbotsford to Macleantown. There is a tendency for the smaller farms beyond the Gonubie River to include vegetables in the cash crops grown. When maize is grown it is only rarely as a cash crop. Most of the crop is used on the farms as silage for livestock or for Bantu rations.

A typical mixed enterprise farm near Mooiplaats, whose level of management is mediocre and typical of the surrounding area, was examined in some detail. It covers 320 acres, and roughly 40 acres were cultivated. The veld is mixed and is quite thick with thorn scrub in places. Being nearly 1,000 feet above sea level and only 8 miles from the sea, the farm lies in the "mist-belt". Water for livestock is obtained from a perennial stream, a headwater of the Cefane. Domestic water supply is caught from the roof of the house. Although the farm had previously specialized in vegetables, it was now concentrating more on the sale of cream to the Komgha Creamery, to which it sent 50 gallons a week in summer. A mixed-breed herd of 88 cattle was kept on the farm, but their progeny were being improved by a newly purchased Guernsey bull. About 10 cows were being milked at the end of the summer. As the farm relied on oxen for motive power, in order to maintain cream production essential to the economy, small tollies had to

be hand-reared and fed with separated milk and mealie-meal. The camp of the farm was spared for winter grazing. There were indications from the occurrence of Hyperrhynia sp. and Sporobolus sp. in the veld that it was being overgrazed. The maize stalks in the lands were grazed off in autumn. Babala and barley were also grown as winter feed. Farm income was supplemented from the sale of eggs and surplus cattle.

Maize occupied half the acreage of crops and was kept for feed and rations. In 1955, a poor year for maize, there had been 80 bags from 20 acres. Of the vegetables still grown for sale at East London market, green-mealies and sweet potatoes were most important. A few pineapples had been planted on exhausted soil in a valley bottom at the height of the boom in prices, but they were not a success. There was a small orchard with a few orange and apple trees in it at some distance from the homestead. None of the arable land was irrigated.

A labour force of 9 Bantu was living on the farm and their families provided seasonal labour. Wage rates were low at 10/- a month, but the usual perquisites such as the use of land for maize, the right to run cattle (16 head), and monthly rations of maize or mealie-meal, were added to the cash wage.

Although the homestead is a soundly built single storey house, there are practically no farm buildings apart from a

few "rondawel-type" store huts and a milking shed.

At the other end of the scale is a large farm whose occupier had partnerships in a nearby farm and another one at Blaney nearly 20 miles away. The two farms half-way between Macleantown and the coast are managed as one; the distant one is used as a source of grazing, a base for sheep rearing and provides extra land for crops. The details which follow relate only to that portion of the business in the region under discussion. Much of the development going on in 1956 was financed by heavy bonds.

Altogether this farm covers 1,700 acres, of which about a tenth is cultivated. The most important crop is maize, grown principally for silage, but which also brings in a significant amount from cash sales. A small acreage of kaffir corn contributes to cash income. The principal enterprises are fresh milk production for the East London market and pineapple and vegetable growing. A herd of 200 cattle included a Friesland herd of 40 cows in milk. They gave on average 50 to 60 gallons of milk a day, which was collected by a lorry from one of the East London dairies. The herd was being built up by a Friesland bull. Considerable additions to the farm income were made by the sale of oxen and other surplus cattle. Over 100 oxen were available for ploughing, but there were also three tractors on the farm.

There was a labour force of some 30 families. No

casual labour was required from Natives living away from the farm. They were paid 15/- a month on average and received the customary "extras". In all there were 90 Native cattle on the farm and 120 goats were kept on the veld which leads down into the Gonubie valley "to keep the bush down". Over 50 acres of land were allotted for the use of the labourers' families.

The layout and management of this large farm have been successfully adapted to the natural conditions. It is situated athwart an east-west trending ridge; the northern slopes carry sweet veld ^{are} and/heavily bushed. They have been split into two large camps for the oxen, heifers and dry cows. The south-facing and sourer slope is split into three camps in each of which the dairy herd spends two weeks in rotation. One camp can be spared for use by Native cattle exclusively, which enables the milking herd to be kept quite separate. This farm was also able to afford grazing for ewes from the farm at Blaney during the winter shortage. Irrigation at the time of the survey was limited to a garden growing potatoes, marrows and peas. Water was pumped from a borehole by engine and distributed by portable sprays. A new dam was being constructed so that the extensive lands in the valley which formed the southern boundary of the farm could then be irrigated from that. The land to be brought under irrigation was to be developed largely for the benefit of the dairying

enterprise: a ronpha grass pasture had been tried and lucerne was to be established. By employing capital and enterprise this farm was a most successful and expanding venture in harmony with the environment.

b) Quru Agricultural Region

This area lies immediately to the west of the Pineapple Belt and may be regarded as a relict portion of an earlier land use region formerly extending further east, into which pineapple cultivation has since spread. The land use pattern is similar to that of the region discussed above; farms are on the large side and are devoted to stock rearing and cream production in the main. It is the undeveloped character of the region - its lack of pineapples - which marks it off from regions to the east. There seems to be no physical reason why pineapple cultivation should not extend here, but it is likely that questions of economy have arisen, due to bad communications and remoteness from towns and industries.

8. The Coastal Agricultural Region

This region extends from the lower Qinira river to the eastern limit of the survey area and lies between sea level and 1,000 feet. It is crossed by a number of short, but steep-sided, valleys which contribute a considerable diversity to the relief. In places there are flatter areas nearer the coast on which it is necessary to protect crops with wind-breaks. Small farms are typical of the region as a whole⁶⁹

but there are variations in farm size significant enough to allow considerable differences in farming type.

The land use pattern of the Coastal Agricultural Region may be distinguished from the region to the west by its greater proportion of arable land - which is generally about 16 to 18 per cent of the total area. There is also a greater diversity of land use here than further inland. Particularly towards the north, there are numerous orchards, many of which are too small to be shown on the coloured map at 1:125,000. This is a more developed region with a more intensive type of farming than is found further inland. It is an area whose nearness to the coast, together with its being well served by the tarred National Road to Natal has proved attractive to a number of part-time farmers. Several work in East London as well as run small ^{farming} enterprises in which they have invested considerable capital.

The coast itself is scattered with camping sites and shack settlements used by summer holiday-makers. A few farmers, fortunately placed in relation to these holiday camps and to coastal hotels at Gonubie Mouth and Bulura, are able to add to their incomes in the summer months by selling fresh milk which they would otherwise not easily be able to dispose of because of remoteness from East London. This remoteness is not purely a function of distance but is due partly to the lack of organized transport for milk, or lack of capital for

PLATE 24



Market garden property on the Transkei road, Qinira River valley. Newly planted Cayenne pineapples in foreground. Privet windbreaks for vegetable beds. Some idea of the density of farm occupance in the valley is given by the number of farmsteads visible from this point.

trucks among producers.

Arable land is normally found in small blocks in similar situations to those in the other agricultural regions. Where larger blocks of arable land occur they are almost always on pineapple estates. The few Bantu-owned farms in the region have rather more arable land than most farms. Tainton village (Released Area 35) is now virtually a Bantu village where cultivated arable lots run right down to the banks of the Cefane river. A slightly greater concentration of arable land is noticeable in the district of small properties at Lilyfontein. In this flatter area it is common for the arable portion of one farm to adjoin that of another. There is a relatively high proportion of cash crops grown in this region. Vegetables of all kinds for the municipal market at East London, and chicory to be sent to Alexandria⁷⁰, are most important; but they are exceeded in area by maize. It had been considered, until the boom in pineapple prices, that the region was unsuited to those fruits. The establishment of a few large estates and the production from a number of smaller farms must have convinced people otherwise. The geographical momentum of the Pineapple Belt had previously limited the extension of pineapples east of East London⁷¹. The supply of skilled labour, the availability of contractors to do heavy clearing work, and the availability of planting material, should be added to the effects of there being more large farms

for development west of East London. Mooiplaats and neighbourhood are well known for the cultivation of carrots and sweet potatoes for market.

Most of the orchards in this region are of sub-tropical fruit trees and guavas may be the most important single type of fruit tree. They are grown principally in the Lilyfontein area, the orchards being surrounded by high windbreaks of Eucalyptus trees. The banana gardens and paw-paw, mango and avocado pear orchards, are usually much smaller and found nestling in corners of valleys, not always on flat land but often on land cleared from the surrounding bush. The development of the cultivation of sub-tropical fruits started about 35 years ago with a view to supplying the urban market at East London with freshly picked fruit. At the present time, with greater developments in the Transvaal Lowveld, and the improvements in communications, that area can compete successfully with the Border Region through most of the year⁷². Banana gardens, which can stand wetter conditions than paw-paws are sometimes situated on the flood plains and on estuary-islands of the larger streams.

There is relatively little woodland in this region except along the coast, where even the dune bush is more scattered than it is further south. In the more dissected area south of Mooiplaats there is quite a lot of bush on the steeper slopes, but it rarely assumes sufficient importance

to enable it to be shown on the land use map. Marshes are more numerous and extensive along this part of the coast than in any other part of the survey area. Unless reclaimed by embanking they are useless for agricultural purposes. The few fragments of established pastures occur in the southern part of the region, and are associated with dairy farming on a large scale, within easy reach of East London. Those on Farm 187 were established under great difficulties and at great expense on sandy soil behind the dune belt, but this was made **possible** by the extra capital available.

Two farms of widely different size have been chosen to demonstrate the details of land use within the region. One covers 2,450 acres and is composed of several smaller lots. It is in two parts, one on the coast and the other on flatter land a few miles inland where the **veld** is more sour. The main enterprises are fruit growing and beef cattle ranching. There are about 15 acres of bananas around one of the estuaries and about 150 mango trees. The produce of these is marketed in East London. Maize is extensively grown on the inland farm, but only for stock feed. A herd of 500 **Shorthorn-Afrikander** crossed cattle is kept with the object of selling fat stock at the spring sales or to the Native trade in summer. Quality is being raised by the introduction of a South Devon bull. A small herd of 12 Jersey cattle provide milk for the homestead and cream for sale to the

Komgha creamery. They are kept on the coastal portion of the farm.

By using the two portions of the farm in a complementary fashion, the farmer makes the best use of the natural conditions.^{s.} The cattle run free all the year round, mostly on the inland portion where they nevertheless suffer from deficiency diseases. Cows are brought down to the sweeter coastal portion for calving. In this way no system of rotation of grazing in small camps is required, although it would probably improve the condition of grazing on both sections. 400 acres of grazing have nevertheless to be hired as well. Cattle are occasionally kraaled to provide manure for the banana gardens.

A relatively large labour force of 14 permanent workers is maintained on the farm. This needs to be doubled in the season for cultivating maize and bananas, when, unfortunately, the women are also keen to work on their own maize patches or go to work on the pineapple farms which have been offering better conditions and rewards. There are 60 Native cattle on the farm in addition.

The other farm is much smaller, 263 acres, and is more typical of the average farm in the region. No field crops are grown for cash or for livestock feed. The occupier has an arrangement with a relative on the adjoining property for both their herds to graze throughout the veld on the two farms.

The main enterprise of the farm is fruit growing. The only cultivation on this property is done in the 3 acres of paw-paw garden and 5 acres of banana garden, none of which was irrigated. There was a 1½ acre plantation of sugar gums to provide poles for the gardens. On the two farms, which total 563 acres, were 80 head of cattle. They did little more than provide milk for the homesteads and sometimes a little cream for sale, or surplus livestock for sale at the local pens. The labour force amounted to 7 permanently employed on both farms. They kept 8 cattle between them, cultivated about 2 acres of maize, but received rations as well as a cash wage of 15/- a month. The only motive power on the farm was an 8-year old truck which was used to take fruit into East London market. Although this was a profitable farm, there were no plans for increasing development, for instance to use the water of the Cintsa river to irrigate the gardens. The occupier was content to farm in simple harmony with the natural background without incurring debts, if anything under-utilizing the resources of the farm. This attitude was met in several farmers of the district, who believed it was difficult for small farmers to finance development on their own or even to raise money to pay for it.

9. Nahoon-Gonubie Pastoral Region

It is no mere coincidence that the name of this land use regions recalls the name of the roughly coterminous Soil

Conservation District. The early proclamation of this district, and the planning of the farms therein, may be partly ascribed to the healthy and lively state of farming in the area, when that farming was confronted with the beginnings of veld deterioration and soil erosion. This region is loosely known as the Kei Road district, from the name of the village, on the main railway line between Queenstown and East London, which serves as its focal point. Although the village is near the western margin of the region, it is linked with the various parts of the region as the focal point of roads. The region itself has a pastoral aspect, either of rolling parkland or of open grassveld. In spite of the apparent lack of development suggested by the small amount of cultivation, closer inspection shows that the veld is now generally in good condition; fences are common and stoutly built, and farmsteads have an air of prosperity.

Arable land does not account for more than 5 per cent of the area of the region. This is not to say that it is unimportant in the farm economy, but that, as far as possible, the veld itself is so managed as to be the mainstay of livestock production. In recent years the role of arable land in supplying feeding stuffs has been partly superseded by that of established pastures. The land mapped as arable was used principally for feed crops: maize, temporary grasses, oats, wheat or lucerne for silage, and hay, as well as for

grazing in the drier months. Silage crops are becoming increasingly important because root crops, such as turnips and mangolds formerly grown for winter feed⁷³ are too liable to disease. Very few cash crops are raised in the region; the climate is unsuitable for pineapples and for wheat and maize as grain crops, while vegetables may be grown profitably only under irrigation. Most farmers set aside about 10 acres of land for maize growing by their Native servants.

Other classes of land use, with the exception of the unimproved grazing, occupy only a small percentage of the whole region. In spite of this, the importance of established pasture is out of all proportion to the area it occupies, when considered in relation to the farm on which it lies. By means of irrigation these pastures can be made to yield nutritious grazing all the year round. Because they are usually separately enclosed in camps only a few acres in extent, and have a carrying capacity four to six times that of the ordinary veld, they are convenient for controlling grazing of relatively large numbers of animals. Some pastures of Italian rye grass, sometimes mixed with lucerne or clover, are not irrigated. Unfortunately it is difficult successfully to establish grass pastures under dryland conditions because of the unreliable rainfall, but there are better prospects for extending the cultivation of dryland lucerne⁷⁴.

There are

few orchards, except those attached to farmsteads solely for domestic purposes.

Most of the woodland in the region is indigenous forest but there are some small plantations of black wattle or Eucalyptus on some farms. The forest is concentrated in several fairly well-defined localities. The middle part of the Nkobongo valley is so well forested that it requires to be distinguished as a sub-region. This is an area of greater relief which is more inaccessible than the rest of the region, and this has resulted in the preservation of a high proportion of woodland. The kloofs below the railway to Komgha, known as Gonubie Spruits, and the upper parts of the main Gonubie River valley, are also well wooded, probably because of a better water supply at points where springs occur in association with hard bands of sandstone.

Because of the overwhelming proportion of unimproved grazing in this region, the manner in which land is used is mainly concerned with the utilization of the veld. The types of veld range from bushy, sweet veld in the bottoms of the more deeply cut valleys, to the sour veld of the ridge extending from Amabele to Gonubie Hill. In between there are large tracts of what is termed mixed veld, which, it is claimed, has become sweeter with regular grazing. In the area of mixed veld, aspect and occasionally soil differences are the main factors affecting the palatability of the grazing. Systems of

rotational grazing are fitted into the pattern of veld-type so far as is possible. It is normal to include in one camp only one veld-type, because of the danger that the sweeter grazing would always be preferred where there are different kinds of veld. Most of the veld in the region is grazed in rotation, this being made possible by the subdivision of all farms into camps bounded by barbed wire fences, many of which have been constructed in the last ten years with government financial assistance. Each camp is provided with a water point for livestock, usually in the form of a small dam that also helps to control run-off. In spite of the improvements so far made, all the veld is included in the category of unimproved grazing because it is in a sense still natural although controlled. If it were extensively fertilized or treated with urea or molasses, it would have been considered as improved permanent pasture⁷⁵. A very little hay and thatch grass is cut from the veld, which is thus used almost exclusively for grazing.

Farming types are more or less uniform throughout the region, and are based on sheep for wool and cattle for slaughter. A few farmers undertake dairying for the fresh milk market, if they are near a railway or milk collecting point. Most farms carry dairy herds in addition to the red beef cattle⁷⁶ but only cream is sold, being what is left after the needs of household and labour have been met. Crop

raising is becoming less common/^{on}most farms; maize especially is not grown as extensively as it used to be. Many farms, however, still carry maize lands, chiefly for the benefit of the Bantu labour force. Such lands are nearly always worked as if they were the farmer's own, except that the work of cultivation is done by the women of the Bantu families without payment. Farming in this region can be carried on with very little labour provided that cultivation is kept to a minimum and can be mechanized. Farm units are large; most are over 2,000 acres. In many instances those who have inherited 1,500 acre farms have added to them. Occasionally the extra portion bought is some distance away from the original farm, in order to secure a different kind of grazing land. This is the alternative to moving stock down to coastal farms for the winter, when the sourveld offers little useful grazing.

It has been known for some time that the Border is not an ideal area for breeding Merino lambs, arising from the treacherous winter weather and the prevalence of sourveld. The practice of buying hamels (wethers) each year in addition to breeding from one's own flock was resorted to, and some farmers in the region continue to do this. It is now possible, as a result of experiments carried out by the Agricultural Research Station at Dohne, for a farmer to keep a breeding flock of "half-bred German merinos" based on the sheep bred at that station⁷⁷. Several farmers have taken to breeding



PLATE 25

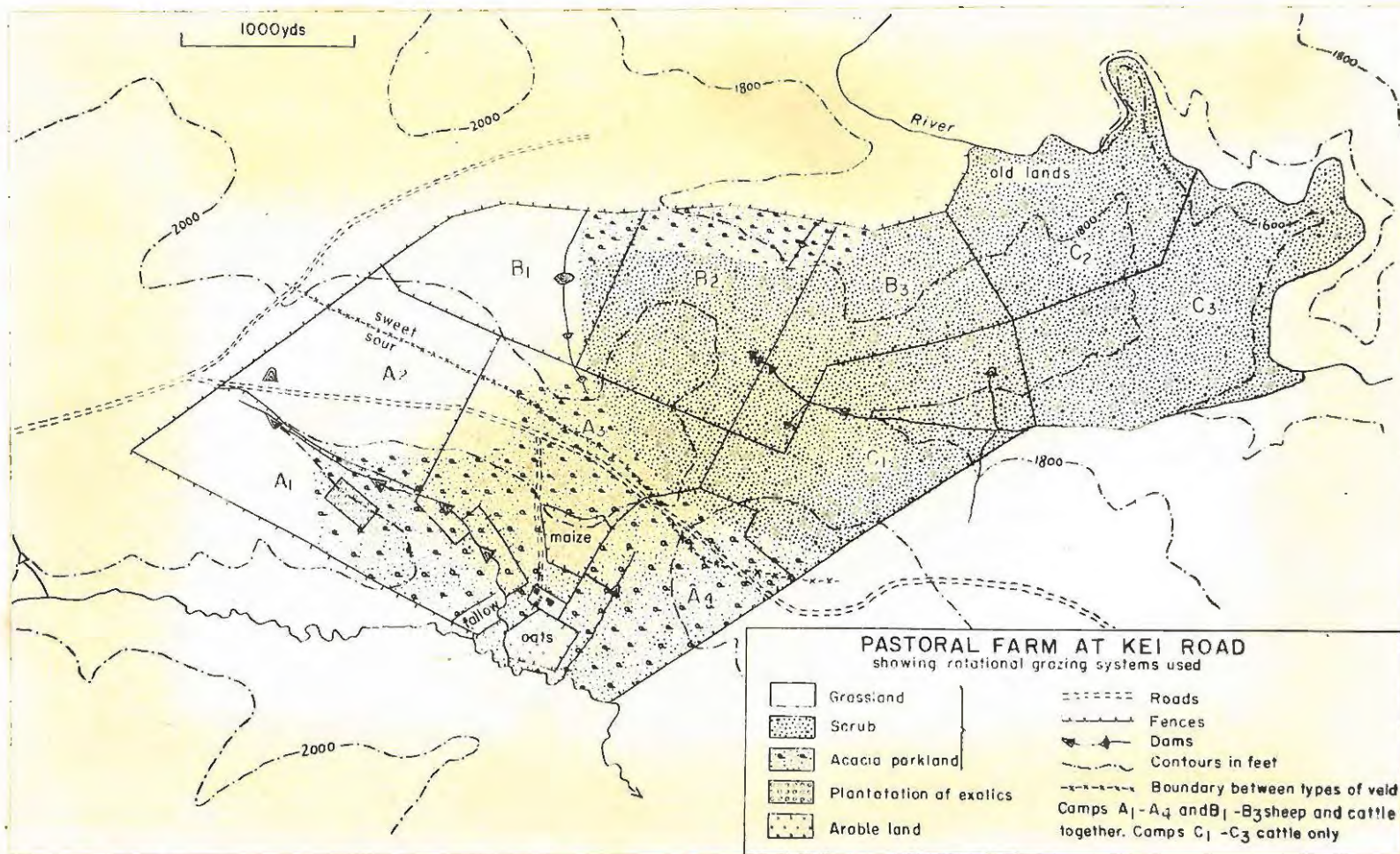
A PASTORAL FARM NEAR KEI ROAD IN 1953 (left) & 1938 (right) SHOWING THE EFFECTS OF SOIL CONSERVATION FARMING. BUSH ENCROACHMENT (marked by 'b') IS SCARCELY NOTICEABLE EXCEPT ON OLD LANDS NEAR COMPOUND

from this stock, which provides them with a fine woolled sheep, useful for mutton; this type has a high birth and survival rate, unlike the pure-bred merino. For the latter type of sheep farming it is of course necessary to have adequate supplies of winter feed of some form or another. This is more than a possibility now that an efficient system involving dryland lucerne has been evolved for the high rainfall areas, such as the higher parts of the Kei Road area⁷⁸.

Although reports by a number of farmers, that there has been serious bush encroachment in the last ten years, are almost certainly exaggerated, a careful comparison of aerial photographs, taken in 1938-9 and in 1953, shows that there has been an increase of scrub, presumably Acacia karoo⁷⁹. One farmer informed the author that in 1932 the interfluves between the patches of bush on the Gonubie Spruits (see Plate 25) were quite clear of scrub. Acacia karoo appears to be the chief invader in the mixed veld areas. Undoubtedly its increase is more noticeable on some farms than on others. On the farm illustrated, the most serious encroachment has occurred on old lands, near the Bantu dwellings, and elsewhere where the grass cover appears thin in 1938. It is also apparent that the sward is thinner underneath large thorn trees and at the edges of the gully-bush. These would be ideal places for encroachment to commencement, once grazing animals ceased to shelter there⁸⁰. In the past decade most

farmers in this region have begun to tackle the problem of scrub increase with a view to rehabilitating the grazing. Various methods have been tried with a fair measure of success. In decreasing order of success they are: poisoning trees with diesoline; painting trees with sodium arsenite (dangerous to stock); ring-barking trees when the sap is up (in summer only); and veld burning (now restricted by soil conservation regulations and effective only with young trees).

To exemplify the way land is used in this region, a farm of 2,600 acres some few miles from Kei Road was studied in some detail. A dolerite ridge runs through the farm, on the north side of which the property descends to a major valley. To the south the country is more open and, although in a shallow valley, it is mixed to sour veld. At the time of the survey there was an extensive stretch of Acacia woodland (parkland type) on the ridge. There were no boreholes, and no dams large enough to supply water for irrigation purposes. All the 43 acres cultivated were thus dry lands. Italian rye grass had been grown for the dairy cows supplying the household. There were 25 acres of maize yielding only just over 3 bags an acre for the Bantu labourers. The remaining 15 acres carried oats which were grazed off by dairy cattle. Most of the livestock contributing to the farm income were supported almost entirely on the veld.



MAP 31

The farm was in the process of being divided into camps when it was first visited; a year later most of this had been completed, and a new system of grazing was in operation. Formerly, when grazing was on free range, the sheep used to graze on the cooler ridge in summer and go down into the sweet veld in the winter. The sweet veld was thus automatically rested each year in the growing season. There was evidence that the sourveld had been overstocked, shown by the prevalence of Sporobolus and Eragrostis. In addition, 50 years ago, the ridge had been cleared of Acacia karoo by the then occupant. At that time the shallow valley had been clear of Acacia, but 10 years ago it had become thick with young trees, and these were being cleared by spraying them with diesoline at the time of the survey.

The main farm enterprises were the production of wool, and of slaughter cattle and sheep. A slight modification was being employed ^{instead} of the normal grazing method advocated in the Soil Conservation Districts's scheme⁸¹. A proper ratio between cattle and sheep was laid down for the area, of 1 to 10; the number of livestock units the farm could carry had been assessed and it had been suggested that sheep and cattle should run together, in order to make more effective use of all the grazing. There were, however, three camps kept for cattle grazing alone; they were remote from the farmstead, covered with scrub, and on the warmer aspect. Of the remaining

seven camps, four on sourveld were used in rotation for dry sheep with a few cattle, and three on mixed to sweet veld were reserved for breeding sheep. Altogether the farm carried between 310 and 340 head of cattle. Of these over 150 were tollies and oxen for beef. There were three Hereford bulls for crossing with Afrikander cows. All cows were milked once a day "to make them docile". This provided the household and labour with sufficient milk, and a substantial quantity of cream for sale. Cattle were mostly sold to the abattoirs at East London, but occasionally also at the local sales at Kei Road.

The major part of the farm income came from the sale of over 15,000 lbs. of wool from about 1,750 sheep. Roughly 800 were hamels but were essentially part of a grassveld merino⁸² breeding flock. A few fat sheep were sold. Over 350 lambs were weaned annually but it was still necessary to purchase a few ewes to build up the flock.

On a farm of this kind labour needs are limited. Eight men were employed regularly. No casual labour was required. Each man received a cash wage of 30/- a month as well as grazing, land to cultivate, rations of maize, separated milk, and a regular supply of meat in the form of two sheep between all families every month. These men owned 60 head of cattle which they milked, but they were not allowed to run sheep of their own on the farm.

There is little need for mechanization on a farm such as this. One tractor provided all the power for work on the farm. A truck was used for local marketing. Most of the livestock was driven on the hoof to Kei Road station or to sale pens. Improvements had been lavished on the homestead, and the underground tank supplying the household with water was liberally used for a fine flower garden. In these respects this farmstead was quite typical of the prosperous class of English-speaking farmers whose ancestors had been granted the land a century earlier.

10. King William's Town

This is the smaller of two land use regions which are distinguished primarily on a basis of their possessing a large proportion of non-agricultural land. The typical pattern of many South African towns which have developed evenly, unaffected by great forces either natural or economic, is seen in King William's Town. Here the fairly closely built-up residential and commercial areas occur in a solid block in the centre of a commonage of unimproved grazing, used by a few dairy herds supplying milk to the local urban market. In this commonage, as well as just outside its limits, are small intensively run agricultural or horticultural properties. The small size of King William's Town reduces the demand for the number of such establishments: only two are large enough to be shown on the land use map. The municipal plantation

of exotic timber trees, another feature common to South African towns, is situated at the margin of the town commonage. King William's Town has both a new textile factory and an associated new Bantu township, Zwelitsha, occupying land just off the southern limit of the commonage, on what used to be the town racecourse and stud farm. The expanse of Zwelitsha township is in remarkable contrast with the more limited extent of the earlier town Bantu locations west of the railway station, housing densities being much lower in Zwelitsha⁸³ than they are in the older locations.

Another feature of great interest is the large expanse of established pastures on the west bank of the Buffalo River. This is on a farm established by the municipality to utilize purified effluent from the town's sewage works. Kikuyu grass pastures irrigated from furrows, support a herd of beef cattle. On the east bank of the Buffalo River, adjacent to the Good Hope Textile factory, is the site of another scheme using irrigation water from industrial sources, this time from the factory. This is situated on Jan Tshatshu's location, a Native area fortunately placed in relation to the Zwelitsha market. After a series of experiments when ordinary crops were irrigated, in 1958 a scheme to irrigate established clover pastures was begun⁸⁴. These were to be divided into acre (half-morgen) plots; the remaining irrigated land was to be divided into 2 acre (1 morgen) plots. Each landholder

entitled to an economic unit was to have one plot of each type. The residents of the location, even under the old system, had been producing fresh milk for Zwelitsha. Under the new one more milk would be available for that market and for the town locations.

The town is itself divisible into a number of sections, analogous to land use regions; a commercial core, an industrial sector and different types of residential area can be distinguished. It is of some interest to note how the core of the town has shifted since its foundation in 1846. The early town grew up around the military station, later known as the Military Reserve, and was little more than a satellite to it until the introduction of German settlers and grantee farmers into the district in 1858. At that time the old town, north-west of the Fleet Ditch, was established as the centre for transport, trade and commerce. A contemporary account⁸⁵ clearly indicates that as early as 1859 there were well defined local differences from north to south. These were: Brownlee's Mission, which served as the town location of the day; the barracks, and the military residences with gardens stretching down to the river, the administrative quarter; the old town of business houses; the new town, mainly private residences but with a few shops and hotels; then Pensioners' village with the German village beyond it. Above the town to the north-east was the Mule Train



KING WILLIAM'S TOWN
URBAN REGIONS

establishment, and south of that the Grey Hospital. The residential area of the town has since expanded on commonage to the east of an area of government land alongside Alexandra Road. Today, administrative offices, schools and a museum occupy that land. The commercial centre has moved from the old town to the new town, between the market square, once crowded with ox-waggons, and Maclean Square. There has been an extension of the shopping area into the German village along Cambridge Road. Below these areas, on the south-west side of the town but still on the left bank of the river, the industrial sector has developed. This was connected first with the presence of mills on the river, and later with the re-routed railway. Most of the present factories as well as the power station are next to the railway line. An isolated residential area lies on the west bank of the Buffalo opposite the Military Reserve.

Throughout its development the town has generally had plenty of land of suitable aspect and situation for its growing needs. The spread of the commercial area has been directed southwards by the barrier of government land from the Anglican church to the old Kaffrarian Girl's School in Durban Street. It was also drawn south by the residential development on that side. The construction of new shops and office buildings in Alexandra Road, east of the new town, is associated with general residential development eastwards,

together with the increased importance of Alexandra Road as the National Road entrance from East London since 1950. The non-agricultural land, other than that with buildings, is mostly peripheral to the built-up parts. The larger tracts are sports grounds and botanical gardens.

11. East London

This area is large enough, and has a large enough population, for it to be divided into two distinct parts: an inner zone, largely of non-agricultural land; and a peripheral zone where suburban and agricultural functions compete for land.

The East London Peri-Urban Zone

This zone is clearly distinguished from the inner area by its more open pattern of land use. The association of built-up areas with small blocks of arable land and occasional plots of horticultural land in a background of veld is also characteristic. There is little extensive woodland outside the Buffalo River valley, which is excluded from this region. There are, however, a number of smaller patches of indigenous forest, much cut out for firewood in years past. The veld on the East London and Cambridge commonages is not much used for grazing, except in certain areas, notably near Amalinda and on the West Bank. It is heavily infested with Acacia karroo.

This zone of small farms and residential plots surrounds the city proper. Some of them were specifically laid out as

small farms for retired soldiers and immigrants in the 1850's. Others like those at Wilsonia are the deliberate creation of land owners, who subdivided parts of their farms into residential erven. A string of such townships lies along the railway between Cambridge and Arnoldton, forming the chief concentrations of non-agricultural land in the area. A few of the occupants of such townships are part-time farmers⁸⁶, but there are more part-time and some full-time farmers in the Amalinda area. It has not been possible to show every fragment of arable land on the land use map, as some are too small to show on a scale of 1:125,000. Originally the plots east of the Amalinda River were 4 acres each, and those west of it were about 20 acres. Although small farms still predominate, the more successful farmers have been able to extend their holdings by buying adjacent plots. Very few pineapples are grown in the area, because of the competition from larger farms further west which can produce them more economically. The farmers with the smaller properties who often specialize in horticulture, either in flowers or in vegetables, usually have no livestock, though perhaps keeping fowls. Those who do own cattle make use of the commonage for grazing, retaining their own plots as arable lands, and produce milk for themselves, rarely sending dairy produce to market. The plots are commonly irrigated, from municipal supplies when available. Some farmers were able to obtain

manure from the abattoirs if they had no livestock of their own.

For their size these intensive farms employ a large number of permanent labourers. A farm of 12 acres specializing in carnations kept 2 men on a permanent basis and needed as many as 5 or 6 women for weeding and cultivating in the season. Another of 23 acres, growing vegetables, had 4 men, as well as casual labour from their families; as this one was reckoned to be a bona fide farm, the Bantu labourers were allowed to live on the property. There are considerable advantages from farming in this sort of way so near a large city. Natives who want to be near town, but not in town, or who are perhaps not allowed to work in town, are freely available as farm labourers. As would be expected, Bantu labour wage rates were very much higher on account of the proximity of remunerative employment in industry in East London. On one extremely profitable farm of 34 acres, specializing in cut flowers, 7 permanent labourers earned an average of £4.10s. a month plus perquisites, but the latter did not include land to cultivate on account of the very high value placed on it, though it did include grazing on poorer land.

East London is a large market for fresh produce, not only the normal market of a large centre, as it is a holiday resort with many hotels. Many of the farmers visited had

individual arrangements to supply retailers as well as the German Market or the market agents in the city.

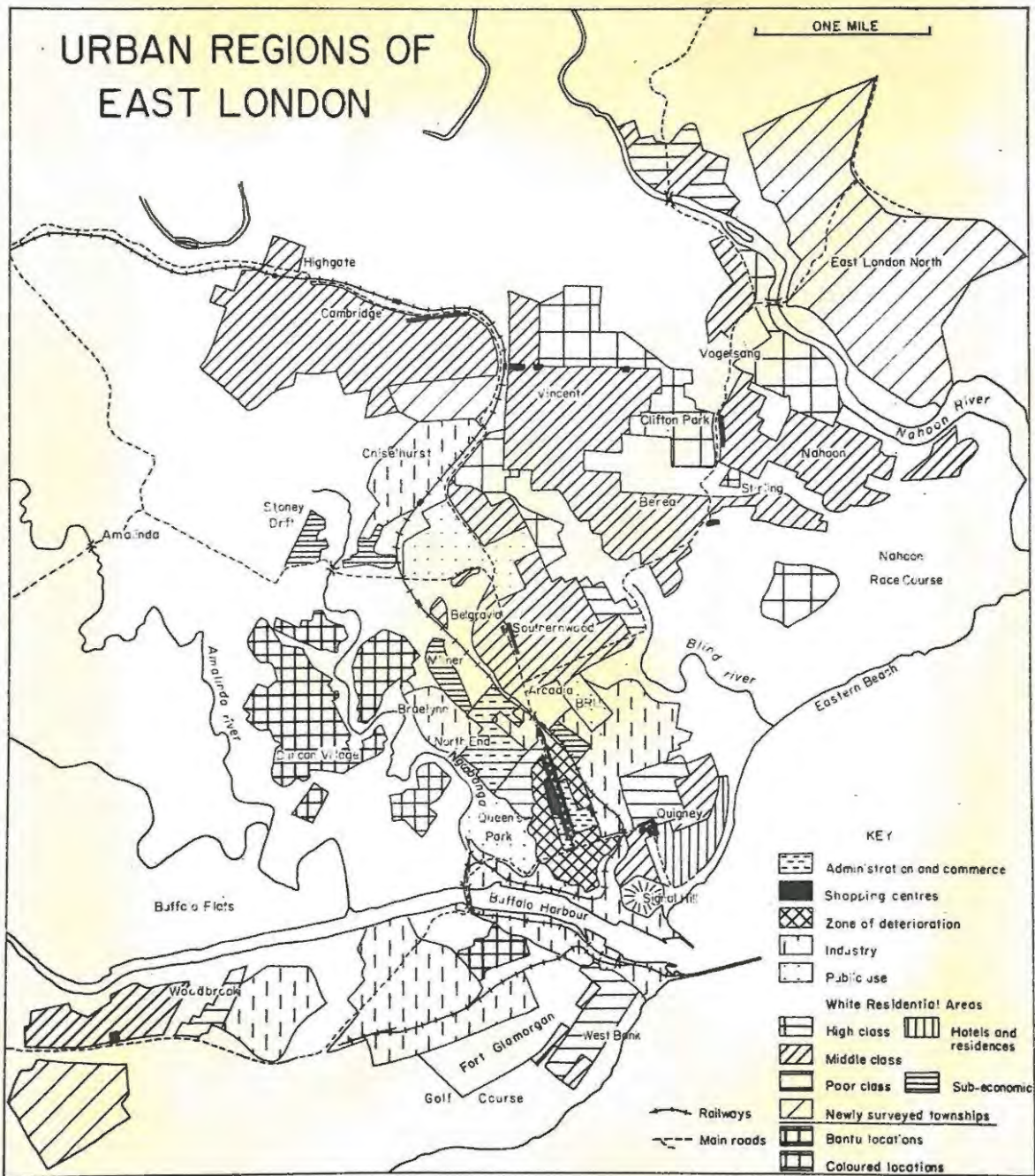
Several of the farms visited in the Amalinda district were shortly going to be affected, if not wholly broken up, by sub-division into township lots. Since the main public utility services have been provided in Amalinda, the pressure of East London's urban expansion is bringing about a decline of intensive farming in the area, and its removal to areas further out along the railway or main roads.

Since the land use survey was carried out, portions of commonage have been used for an agricultural show-ground, and for a drive-in cinema. Various municipal works that have to be at a distance from the city, such as abattoirs, reservoirs, and refuse tips, have been located on the commonage in this outer area.

The Inner Urban Zone

The geography of the city of East London has been the subject of a detailed study by F.L.Moult⁸⁷, and an account of the origins of the settlement has been included in Chapter 7. For the sake of completeness, however, the land use pattern of this zone will be examined, and reference will be made to the several urban regions into which the city may be divided.

The main feature is a T-shaped area, almost continuously built up and broken only by Buffalo Harbour, stretching from



the West Bank to Vincent, where it spreads in both directions along the watershed south of the Nahoon River. There are several large tracts of non-agricultural land not built over, generally marginal to the main built-up area. The provision of open spaces of any size was not considered by the planners of the early townships, except when they created Queen's Park. This conveniently occupies steep ground right at the edge of the grid-iron layout of ^{the} centre of East London. The next most extensive class of land use in this zone is the dune bush which covers Signal Hill and the sand dunes from the Eastern Beach to the Nahoon River mouth. The small fragments of veld which remain are of more use as buffer zones between different residential areas than they are for grazing. They tend to be regarded as open spaces of recreational value, especially near the East Bank location.

There are three significant factors that have affected the present shape and nature of the non-agricultural land comprising the functional area of East London. First, the site on which the city and its suburbs have been built is a primary factor that has controlled the shape of the built-up area. Apart from the rather isolated West Bank townships, the whole of the city is squeezed between the Buffalo and Nahoon Rivers, and especially between the valleys of the Ngcabanga (First Creek) and Blind Rivers. The flatter interfluves provide quite good sites for street layouts and housing,

in contrast with the deeply headward-cutting tributary valleys. At the present time there is a shortage of relatively flat land within easy reach of the city. This has forced residential development further out on the West Bank and across the Nahoon River. Second, the original layout of townships by Colley and his successors⁸⁸, clearly indicates that they were guided at first by the availability of flat land. These townships have in their turn guided the spread of the city from its original nucleus. It is noteworthy that the agricultural lots of 1 acre and 4 acres, on which the present Southernwood and Vincent are built, were on more hilly ground that has not proved ideal for a grid-iron pattern of streets. The same is true of Cambridge and Cambridge West, whereas the old Cambridge village (now Highgate) lies on fairly flat land. Nevertheless neither the townships nor the associated agricultural lots were on really steep land. The ramifying kloofs, cutting deeply into the main watershed, limit the areas of flat land and guide the direction of the surveyed plots, which are thus at awkward angles to each other. No thought was originally given to the development of through streets or routeways other than the arterial Oxford Street, which continued along the main Buffalo-Nahoon watershed. Most of the separate townships have had to be specially linked at a later date. These ^{links} include the main Transkei road which ~~serves as a connecti~~ ~~link between~~ the city, Berea, Sterling,

Nahoon township and East London North. When the railway was constructed it was taken up the watershed as far as possible to avoid the existing townships. At the old Cambridge village, however, the choice lay between a difficult and circuitous detour or cutting through the town lots; the latter was chosen, presumably proving less expensive. Third, the presence of the railway has had a definite effect on the nature and direction of the expansion of the city since 1875. The railway has acted as a social divide between classes of residential area, especially in the stretch south of Cambridge. There are only 5 road bridges over the line in the 5 miles from Highgate to East London, a measure of its effectiveness as a divide. The line serves to divide the sub-economic housing estates of Milner, Stoney Drift, the industrial areas of Brae Lynn and the slum area of North End from the better-class residential area east of it. The line, before it was re-graded and re-routed, had limited the extension of Belgravia township, laid out after the Anglo-Boer War. The railway, paralleled by the main road to King William's Town, also formed a natural boundary to the later Selborne township. The line also provides a barrier to intercourse between Cambridge and Vincent; although both use Vincent station, these two suburbs are virtually self-contained for general shopping and have separate bus routes into the city. The existence in the centre of East London of a large railway

repair yard cuts off the Quigney from the other suburbs further north, there being only two circuitous connecting roads. The railway has, of course, attracted to itself industrial development which needed rail facilities, so that Chiselhurst, Arcadia and North End appear well sited as industrial townships. The West Bank industries followed, consequent upon the provision of railway sidings and of oil storage tanks in the 1930's.

The development of regional specialization of function within East London occurred quite early in the history of the city (as it did in King William's Town, which exceeded it in importance until the 1890's). This process followed the very usual pattern of the spread of certain functions from inner to outer areas as the core area of the city expanded and as the inner parts became congested.

The first business centre, of which there are a few reminders like the old post-office, some old shops and a church, was in the earliest settlement on the West Bank. This was next to the military station of Fort Glamorgan, and above the landing stages at the end of the military road to King William's Town along the Goolah Heights. The growth of the later business centre on the East Bank, with the coming of the railway, has been noted in Chapter 7. This second centre had its initial growth between the harbour and the market square, but only a few relict businesses remain here from that

stage. The wool trade, however, is still largely in this earlier area, represented by the Wool Exchange and several wool stores; it should be noted that the new and larger wool stores have been built elsewhere, further from the harbour because of congestion. The business heart of the city now lies somewhat east of the Oxford Street axis, between that street and the railway station, and along Cambridge Street. The growing and continuing influence of the railway on commerce is a powerful factor. The retail shopping centre lies along Oxford Street, and also extends into a few of the cross-streets, but in these no further than about 200 yards. Towards the lower end of the shopping centre there has been much building activity in recent years, including insurance houses, multiple stores, places of entertainment, and a new market building north of the market square. This is tending to draw the shopping centre away from the City Hall, at present in the middle of it, towards the Fleet Street crossing. On the west side of Oxford Street, the dip which contains Buffalo Street is a zone of small workshops, garages and businesses occupied by non-Whites; this is a zone of deteriorating properties and declining values. There has been considerable rebuilding, however, on the higher part towards the harbour, including the end of Buffalo Street. Between the new market building and Queen's Park are a number of large showrooms for garages, machinery agents and agricultural

suppliers, as well as a number of the wholesalers so typical of the city's business activity. The zone of deterioration stretched from the dip of Buffalo Street as far as the Presbyterian church and affects property west of Oxford Street. The churches in the neighbourhood of Park Avenue were established on the first available land, which was outside the first townships and near the prosperous suburb of the day, at a time when congregations felt a need for better and more permanent buildings. On the east side of Oxford Street the railway insulates property from the more dynamic economic changes.

To a certain extent the business core has tended to extend north along Oxford Street, but it rapidly gives way to a zone of deterioration before it crosses the railway line. Shopping centres have grown up at most of the important intersections in each township; the largest of these is that at the crossing of Fleet Street and Currie Street in the Quigney. The shopping centre at Cambridge has not advanced since the separate municipality was merged with East London in 1943, when the town hall of the former lost much of its utility.

Immediately to the north of the business centre of the city lies an area which is partly residential and partly concerned with business. The latter function has invaded the high-class residential area of Southernwood and Belgravia.

Many professional men have their offices in the large villas of this area; one large residence has been converted into an art gallery, and very few private residences remain. Some of them have been converted into flats, others have been demolished to make way for modern flats, while others have been converted into private hotels and boarding houses⁸⁹. This is essentially a residential area closely connected with the fact that many of the town's White workers are employed in the service industries. The younger and less well-off of these, perhaps employed for the first time in the city, live here, as do a few retired people who wish to be near the town centre.

The lower part of the Quigney, nearest the sea, has a particular character conferred on it by large hotels, amusement places, and other beach-front attractions. The low value of older residential property in the Quigney has facilitated the construction of hotels, as it has the construction of blocks of modern flats away from the beach front. There is a fine esplanade; formerly served by a tramway through the Quigney to the city, and it is the main artery of a long established recreational area. There is no evidence that dunes were ever removed to make the esplanade more inviting⁹⁰. Camping during the summer holidays on grassy slopes set aside for the purpose is a special feature, as it has been since the earliest days of East London.

Superior residential localities, with high-value and often double-storey houses in an acre or more of ground, are found today on the edge of the built-up area. They are commonly on sloping land which gives good views, for instance over the Nahoon River valley from Vogelsand, Vincent Gardens and Clifton Park. Selborne is a slightly older high-class residential area which largely replaced Southernwood in this role. When East London was completely separate from the village of Cambridge, the Belgravia and Southernwood areas, with their double-storey villas of the Edwardian era, were the high-class districts. In earlier days still North End fulfilled the same function, when it was at the edge of the town.

As a result of the high average standard of living of White South Africans, middle-class housing covers by far the largest areas. Areas once middle-class have tended to remain middle-class, except in the innermost zones, where business expansion is greatest. These are areas of small erven; the more prosperous may have moved out, but a permanent population of persons of moderate income is continually augmented from the ranks of salaried persons or by the addition of retired people.

Poor-class residential areas are few in number, and are almost always associated with subdivision of larger plots into extremely small erven, with little space ~~in~~ apart from to

a house on each erf. They are also usually composed of older houses, often single-storey buildings of wood and iron or plastered rubble. The lower end of Southernwood, part of North End next to Queen's Park, upper Quigney and old Woodbrook have this character.

Sub-economic housing, which is placed in a different category, is planned housing subsidized by the municipality or by the railway administration and is an entirely new development. The houses are small by White standards and are all alike. This type of housing is found next to industrial areas or near the Native locations on the western side of the city, i.e. in the least desirable situations.

The gradual decline of North End to slum status, through excessive subdivision of acre garden lots has resulted in property becoming available to non-Whites, who now form the majority of the inhabitants there. This would be regarded as a residential part of the zone of deterioration which lies between Buffalo Street and Queen's Park. The earlier status of North End is suggested by the presence of several churches built in the prosperous last quarter of the 19th century. They remain, but their congregations have mostly moved away to the more northerly suburbs.

The other residential areas are the Coloured and Native locations. They now occupy circumscribed positions on the commonage to the west of the main part of the city. Their

development is described by Reader in The Black Man's Portion. It has for some time been evident that there is not enough room between Amalinda (a proclaimed White area) and the rest of the city to build new Bantu housing. In accordance with the new principle of placing such locations well out of town but yet fully provided with all public services, a new situation between Arnoldton and Mount Ruth has been agreed on for a location to house roughly 100,000 Bantu⁹¹. On the other hand, room has been found for the expansion of housing schemes for Coloureds at Buffalo Flats, opposite Woodbrook and overlooking the Buffalo River. In fact plans are being made to convert the Bantu home-ownership scheme west of Parkside to a Coloured housing scheme⁹².

Industrial development in East London is closely connected with the harbour facilities, although the confined estuary of the Buffalo River has not permitted any but the most essential development near the river. Even the oil storage tanks are located half a mile from the harbour and connected by rail sidings to it. Factories have been generally limited to certain flatter pieces of ground with rail facilities. These are commonly marginal to the main part of the city and mostly lie west of it. A new industrial estate is being built up at Wilsonia, whilst the ones on the West Bank have received large and important additions in the past few years. The two new pineapple canneries are located

here, in a situation suitable for receiving supplies of fruit by road from the main producing areas to the west. The older industrial areas at Arcadia and North End are now congested, although nearer labour supplies, and new factory development on an extensive scale has to be on sites with more space for layout and expansion. The main disadvantage of being on the West Bank, and this holds for residential growth as well as industrial, is the difficulty of access to it from the city centre across the one narrow combined road and rail bridge across the Buffalo river.

REFERENCES TO CHAPTER 12

1. Tamara or Tamacha was used as a location name in the 19th century when locations were much larger than at present. It gave its name to the local council whose seat was in King William's Town in the first half of this century.
2. King William's Town Gazette, July 1859.
3. Photo No.6299 Strip 6 Job 332 1953.
4. Report of the Superintendent of Woods and Forests, Cape of Good Hope, 1886. G41-'87, p.29.
5. Report of the Supt. of Woods and Forests, 1884. G32-'85, pp.32-33.
6. Report of Supt. of Woods and Forests, 1885. G34-'86, pp.38-39.
7. D.M.Comins (see Chapter 5).
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9. Report of Supt. of Woods and Forests, 1883. G.32-'84, p.35.
10. It is believed that the State Saw Mills at Stutterheim closed down during the season 1958-9 (after this survey was made).
11. See the section on the Pineapple Belt.
12. Acocks, J.H., Veld Types of South Africa, Botanical Memoir No.28, pp.24 and 172.
13. Report of Supt. of Woods and Forests, 1886, G41-'87, p.46.
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15. See section on Pineapple Belt for the location of this factory.
16. Tollies are weaned oxen.
17. See Chapter 11, pp. 201,210
18. D.M.Comins (see Chapter 5).

19. The figures used for 1875 were "area undercultivation by Persons other than European or White" less the "areas under cultivation by the classes defined as sub-lessees, squatters and vagrants other than European or White". Measurements made on modern maps of the districts as then constituted show clearly that the areas given in the 1875 census are inaccurate. Census of the Cape of Good Hope Colony, 1875, G42-'76, Part IV. See appendix on boundary changes.
20. Barrow J., Account of travels into the interior of Southern Africa, etc. 1801 edn. Vol I. pp.202-3 and 222.
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21. Commission on Native Laws and Customs, 1883; G4-1883.
South African Native Affairs Commission, 1903-05, Vol.II, Appendix C, Minutes of Evidence given in the Cape Colony.
22. G4-'83, Rev. J.A. Chalmers, Q2326 not fully borne out by Toto in Q1287. Toto (Q1291) says that there is a case if negligence is proved.
23. G4-'83, Q1286.
24. Despatch from Sir George Grey to Colonial Secretary; dated 18 October 1856. Further Papers relative to the State of the Kaffir Tribes, P.P. 1857-58 XL (2352) para 14. But fencing was the exception, T. Liefeldt, G4-'83, Appendix C, p.131.
25. Blue Book on Native Affairs, 1884. G3-'84. R.J. Dick, p.31.
S.A.N.A.Commission, 1903-05, Vol II. R.J. Dick, Q5607;
N.C. Umhalla, Q6593.
26. G4-'83: Appendix C. Reply to circular, by T. Liefeldt, p.131
27. S.A.N.A.Commission 1903-05, Vol.II. R.J. Dick, Q5635
28. Blue Book on Native Affairs, 1884. G3-'84, R.J. Dick, p.31
29. J.X. Merriman's evidence to S.A.N.A.Commission, 1903-05, Vol.II, Q5167. R.J. Dick's remarks in G3-'84; and his suggestion about the sub-division of locations and the removal of surplus population to the towns, in S.A.N.A.Commission, 1903-05, Vol II, Q5708.

30. W.G.Bennie in The Bantu Tribes of South Africa, Vol.III, Section 1. Cambridge, 1939, p.29.
31. G4- '83, Nathaniel Umhala's evidence, Q4701.
32. This was carried out by a Mfengu research assistant, Enos Xotyeni. The area of this survey coincided with the area of wider interest which was the subject of anthropological research by M.F.Wilkes, 1956-8. Much of what follows, especially in relation to details of Khalana, is based on comments and advice given by him. The author is deeply indebted to both of these workers.
33. It is not the place of this volume to enter into a discussion of what the terms "Red" and "Christian" signify. They are used here as a rough and ready guide to differentiate the pagan and conservative families from the partly westernized families.
34. It is difficult to assess how many cattle are exchanged in this way as the number of people willing to part with young stock is very small. Although the farmers say they exchange cattle only, this may be restricted to exchanges for customary purposes.
35. See Economic Development in a Plural Society, p.84 for an estimate for the whole district.
36. 24.3 bags of maize per family of seven represents the average annual consumption in the Reserves. See note 32, Economic Development in a Plural Society, p.88. Each person presumably requires about $3\frac{1}{2}$ bags a year.
37. Personal communication M.F.Wilkes.
38. Only Y's umzi is marked on the aerial photograph. That of his brother's widow is not distinguished.
39. See Chap.7, pp. 97, 98
40. There were 290 acres of fibre crops (mostly Phormium tenax) in the King William's Town district's Native reserves in 1957. Some is planted near Pirie Station.
41. Some of the place names, for instance: Kalikeni (from Callaghan's); Erasmus, sometimes Twecwana; Openshaw, sometimes Jojolipezulu; are derived from the names of the earlier White occupants and have survived to the present day.

42. Average ^{number of} acres per cattle unit in certain Bantu areas 1950-1
- | | |
|---------------------|-----|
| Released Area 33 | 8.4 |
| Newlands Location | 4.8 |
| Mncotsho Location | 3.8 |
| Mooiplaats Location | 3.6 |
| Kwelera Location | 3.6 |
43. Statistics from District Record Books of the Native Commissioners, East London and King William's Town.
- 43a. Report of Native Commissioner, East London to Chief Native Commissioner, Cape, on agriculture, 1956-7 (unpublished).
44. Reports of the Native Commissioner, East London to the Chief Native Commissioner, Cape, on agriculture (unpublished). In 1952-3 11 acres of Phormium tenax planted, but germination was poor. In 1955 there was only half an acre of fibre grown by individual Bantu farmers.
45. See the next section, p. 293
46. See Economic Development in a Plural Society, pp.47-51 for the back-ground reasons for the boom and slump in the pineapple industry.
47. In May 1960 it was learned that there had been preliminary moves to apply a marketing scheme to pineapples under the Marketing Act, in order to protect the industry from the worst results of variable competition from overseas producers. At the same time hopeful signs of an extending market in Western Europe, particularly in Germany, have been detected. Barclays Bank D.C.O. Overseas Review, May 1960.
48. See this volume Chap.5, p. ... ?
49. Personal communication W.B.Meyer, Silverdale, East London.
50. Yield of pineapples in the East London district (on White farms) 1950: 7,803 tons; 1955: 13,090 tons; 1956: 16,594.tons.
51. Experiments on these aspects are now being carried on at the Pineapple Research Station, East London.
52. Latest methods of cultivating pineapples are described in a series of articles in Farming in South Africa for May, June, July, August and September 1956. See also J.C.Le Roux, Farming in South Africa, July 1951.

53. Reports in Eastern Province Herald, 28th April, 1956; East London Daily Dispatch, 21st June, 1956; and East London Daily Dispatch, 30th June, 1956.
54. The more strictly economic aspects are discussed in Economic Development in a Plural Society, pp.47-51, those which concern the inter-relationship of production, transport and marketing with other factors in this area and in others are dealt with in this chapter.
55. Le Roux, J.C., Farming in South Africa, July 1951, quotes: Clark, H.E. and Kerns K.R., Science, 95, 1942, pp.536-7 Clark L.H. Farmers' Weekly, 26 January, 1949.
56. An Economic Survey of the Pineapple Industry in Queensland, Division of Marketing, Department of Agriculture and Stock and Council of Agriculture, Brisbane 1957, p.53.
57. Including one placed under judicial management by the Supreme Court, Cape Town in 1958. East London Daily Dispatch, 26 June, 1958.
58. Farmers' Weekly, 13 February, 1957.
59. Report of statement by the Minister of Economic Affairs, in reply to a speech by Mr.H.G.Martins, Member of the House of Assembly. In East London Daily Dispatch, 4 September, 1958.
60. Farming in South Africa, May 1960, p.88.
61. Drawn from Report of Select Committee on the Export of Canned Fruit and Vegetables 1959, S.C.12-'59, p.5 (evidence of the Secretary of the National Marketing Council), and from Farming in South Africa, May 1960, p.88.
62. Economic Development in a Plural Society, p.72.
63. See Chapter 7, p. 93.
64. Village Management Board regulations.
65. The word kraal is used here, instead of umzi, for a collection of Native huts on farms occupied by Whites. It is the term most commonly used in this context. In the Border the number and arrangement of huts is rarely such that the use of the term compound is warranted.
66. Irving, J. Macleantown Survey. Institute of Social and Economic Research, Rhodes University, Occasional Paper No.4, 1959.

67. See Chapter 11 and map of milk supply of East London (opposite p. 205)
68. Border Regional Survey data: economic survey of a sample of 60 farms.
69. See Chapter 7, p. 113
70. Young, B.S. The Union's Chicory Industry, South African Geographical Journal, 41, 1959, pp.45 and 49.
71. The "East Bank" is a regional term for the district east of the Buffalo River.
72. The Market Master, East London, informed the author that the supply of local fruit exceeded that of up-country fruit only during January, although the former was entering the market throughout the season.
73. Wallace, R. Farming Industries of the Cape Colony. P.S. King William's Town/East London, 1896, p.46.
74. Graven, E.H. and van der Merwe, S.F. Farming in South Africa, April, 1960, p.33, see also Graven, E.H. and Barnard, H.H. F. in S. Africa, March 1960 p.25, and personal communications from research officers by courtesy of the Director, Dohne Research Station.
75. See the details of classification used by the World Land Use Survey, Van Valkenburg, S., Economic Geography, 26. 1950, p.4.
76. "Red" cattle usually include Afrikander, Hereford, Shorthorn and South Devon breeds, and various crosses between them.
77. Kotze, J.J.J. The Development of a Mutton-Woolled Sheep for the Sour-Grassveld Area. Farming in S. Africa, April 1951.
78. Graven, E.H. and Barnard, H.H. Dryland Lucerne changes Farming System. Farming in South Africa, March 1960, pp.25-6.
79. Compare for instance Photo. No. 15182m strip 46, Job 134/38 with Photo No.6545, Strip 4, Job 332/53. See plate 25 opposite p. 327

80. The botanical side of the ecology of the encroachment of Acacia karroo is dealt with by Comins, D.M., in Chapter 5.
81. Soil Conservation Scheme: Nahoon-Gonubie Soil Conservation District (unpublished), Department of Agriculture, 1950.
82. See Note 77.
83. See Economic Development in a Plural Society, p.294 and compare the pattern of houses on 1:18,000 Topographical Survey Sheet No.927 (3227 04) provisional, unpublished, Trigonometrical Survey.
84. These do not figure on the land use map.
85. Leader in the King William's Town Gazette, 12 February 1859.
86. They would fall into the category I(b) Smallholders of the agricultural survey. See Economic Development in a Plural Society, pp.68-70.
87. Moulton, F.L. East London and its Geographical Setting. M.A. dissertation Rhodes University (unpublished), 1951, q.v. especially Chapter 3, The Cultural Milieu, the modern city pattern. Some of the material presented in this section is based on Moulton's work. It is considered advisable to repeat it here and to include a map of urban regions for the sake of completeness and to bring Moulton's work to a wider public.
88. See the plan of East London drawn by Pomeroy Colley, G.Lt., R.E., in East London Centenary, 1848-1948, p.168. A printed version of the original on a large scale is in the office of Parkin and Tomlinson, Land Surveyors, Terminus Street, East London.
89. See map (Fig.29) in Moulton, F.L. East London and its Geographical Setting.
90. Compare Moulton, F.L., pp.105-6 who suggests that the sand-hills were removed by artificial means to make way for the esplanade. Photographs of the period circa 1900 indicate that the foreshore and coast ~~appeared as they are today~~ and that there were never considerable sand-hills between Signal Hill and the Eastern Beach. This section would therefore have been similar to the coast below the West Bank strand.

91. New site for East London's Native Location. East London Daily Dispatch, 23 August, 1958.
92. See plan published in East London Daily Dispatch, 5 March 1959.

APPENDIX 1

A STUDY OF BOUNDARY CHANGES AFFECTING THE BORDER REGION

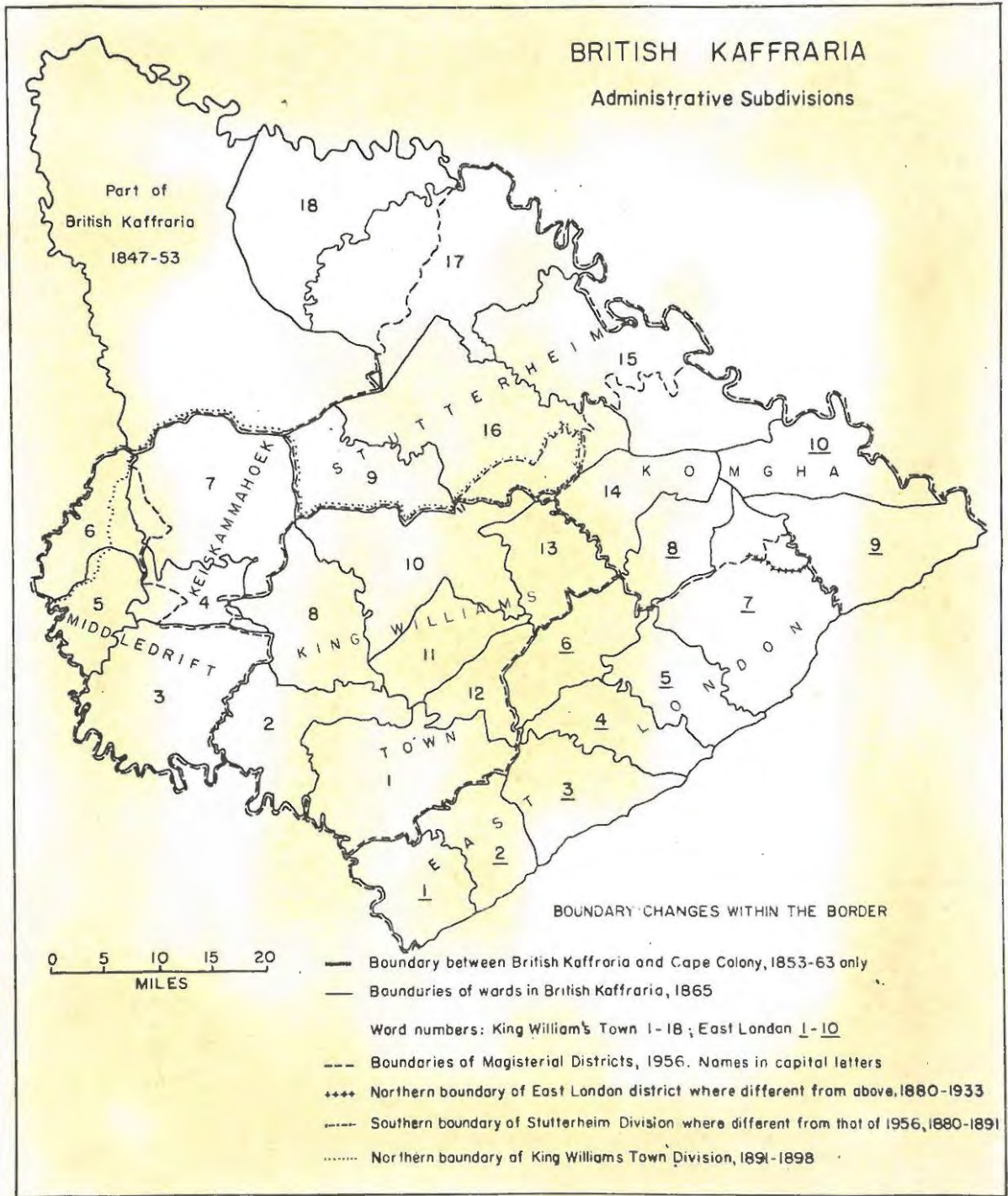
The Border Region i.e. the present magisterial districts of East London and King William's Town, lies in the area between the Keiskamma and the Great Kei Rivers in the Eastern Cape Province. The region between these rivers was first brought under British control with the proclamation of the Province of Queen Adelaide in 1835¹. The province was short-lived, however, and did not survive one year². For another twelve years the territory was occupied only by Bantu tribes and a few Missionaries.

Following the War of the Axe in 1847, a part of the ephemeral province 4224 square miles in extent, was designated British Kaffraria³ while the rest was annexed to the Cape Colony as the division of Victoria⁴. The new territory was bounded by Victoria, to the west of the Keiskamma and Tyumie Rivers and of the Klipplaat River to the north of Gaika's Kop, and it was separated from Kaffraria proper to the east by the length of the Swart Kei and Great Kei Rivers, from the junction with the Klipplaat River near the present-day Tylden.

By the end of the Eighth Kaffir War in 1853, the grasslands in the interior of this border area, around that part of British Kaffraria furthest from the coast, were available for settlement by farmers. Queenstown was founded as the centre

BRITISH KAFFRARIA

Administrative Subdivisions



Part of
British Kaffraria
1847-53

BOUNDARY CHANGES WITHIN THE BORDER



- Boundary between British Kaffraria and Cape Colony, 1853-63 only
- Boundaries of wards in British Kaffraria, 1865
- Word numbers: King William's Town 1-18; East London 1-10
- Boundaries of Magisterial Districts, 1956. Names in capital letters
- +++ Northern boundary of East London district where different from above, 1880-1933
- - - Southern boundary of Stutterheim Division where different from that of 1956, 1880-1891
- Northern boundary of King William's Town Division, 1891-1898

of an inland division at the expense of 650 square miles of British Kaffraria⁵ and part of Victoria. Sir George Cathcart later extended the British Kaffrarian boundary⁶ northward from the Thomas River to a line along the Great North Road to the Windvogelberg (near Cathcart) and thence along a defensive ridge to the Swart Kei River. He thus included the country of Anta and Oba, Gaika chiefs (the future Ward 18). This boundary was re-defined in 1863⁷ near Dohne Peak (Kaklazeli Mountain), giving a small area of the Colony to British Kaffraria near the new township of Greytown.

During the first years of the dependency of British Kaffraria, the port of East London on the West Bank of the Buffalo River, including a rayon of two miles of ground and a Reserve on the East Bank, were left in the hands of the Cape Colonial government⁸. In many ways they seem to have been considered as part of British Kaffraria before 1859⁹, when they were given up by the Colony.

Up to 1865 several schemes of local division were tried out, none of them subsisting for long. Magistracies had been established at the main White settlements, and with some of the important chiefs of the Bantu tribes. Such statistics as are available for the period are based on these divisions, as the magistrates were responsible for the censuses. Several maps exist showing subdivisions at various periods: they are but sketches. More reliable maps can be drawn from contemporary

AREAS (

'S TOWN	
Ward	Sq. Mls. Including
1	83
2	73
3	109
4	84
5	83
6	93
7	198
8	70
9	144
10	109
Total	1,046

Town, Brownlee's Station
Town, Breidbach, Hanover,

, Umgwali
lsen, Umgwali
rg, Henderson

boundary descriptions, which exist for 1859¹⁰, 1861¹¹ and 1865¹².

In 1865 the Fiscal Divisions of East London and King William's Town were created. They were composed respectively of ten and eighteen wards delineated on Map 33 (see also Note 1 below). The importance of the wards of 1865 is due to the fact that they were made the units of enumeration for the Cape Colony's Second Census in 1875. From these a detailed picture of British Kaffraria in 1875 can be built up, which can be compared with the present districts of East London and King William's Town in greater detail than is possible for any other year until 1937.

From 1875 there is a gradual reduction in the size of the original divisions. This is particularly marked in the case of King William's Town, whose Divisional Council area now covers only 1345 square miles, scarcely more than half of its former size. Part of the cause is to be sought in the rapid rise in population (nearly 400 percent increase between 1865 and 1951), and part is due to the foundation of separate centres such as Stutterheim (1857), Komgha (1864) and Cathcart (1880).

In 1880¹³ the Stutterheim and Komgha Divisions were created wholly out of the King William's Town and East London Divisions. In 1864¹⁴ the first shot, in a dispute between Victoria East and King William's Town Divisions, was fired by

the inhabitants of Alice in the former division who petitioned the Cape Parliament in the hope of taking over Fort Hare, just across the Tyumie River. The whole of the Tyumie River Valley east of the river was accessible only from Alice, and was in King William's Town Division until the arbitrators decided on its transfer to Victoria East in 1891¹⁵. Then in 1898¹⁶ the arbitrators awarded a tract of country, adjacent to the Great Kei Road and normally dependent on King William's Town, to the latter division.

Just after the beginning of the new century, the focus changes from the Fiscal Division to the Magisterial District. In the first Union Census in 1911, the Magisterial District was adopted as the basis of enumeration and publication of statistics. Some minor changes occurred in the year following, but in 1937¹⁷ the magistracies of Middledrift and Keiskammahoeck were created out of King William's Town, causing a loss of over 500 square miles of mountainous country populated mainly by Bantu. The present division of King William's Town has since that date included the areas of the Middledrift and Keiskammahoeck districts. Since then there have only been minor adjustments of boundary.

The story of the growth of the towns, and expansion of their boundaries, within the broader region is more complex. The limits of the borough of King William's Town were early fixed by proclamation¹⁸. The steps taken in the expansion of East London and the growth of its satellite suburbs, each of

which has been incorporated, **are** set down in Note II.

Table 2

AREAS OF DIVISIONS (TO 1898) AND DISTRICTS OF EAST LONDON
AND KING WILLIAM'S TOWN

	EAST LONDON	KING WILLIAM'S TOWN
1865	1046 square miles	2530 square miles
1880	684	1359
1891	684	1305
1898	684	1347
1933	689	1345
1937	689	854
1956	689	854

NOTE I

Compilation of Map 33: Boundary Changes

All the areas quoted in this paper were measured on a tracing paper original drawing, which was overlaid on a 1:250,000 topo-cadastral map of that area. The areas differ somewhat from the officially given extents of the districts throughout the years. In the 1850's the area of British Kaffraria was estimated by the Colonial Surveyor General at 3050 square miles, and in 1875¹⁹ the Divisions of East London and King William's Town were given as 1225 and 1781 square miles respectively. As the survey of the districts progressed the area given became more accurate, and in 1937 the two

magisterial districts were given as 689 and 819 square miles respectively. The most recent measurement (by the Surveyor General of the Cape with a planimeter on the maps of the 1:500,000 Administrative Edition) gave 693 and 854 square miles. (On this map the boundary of the districts is a mauve line 1/20" to 1/30" wide, and may result in minor discrepancies).

On map 33 the boundary as at 1853 along the Klipplaat River is only sketched in roughly. The interpretation of the boundaries of wards in 1865 was aided by reference to a sketch of farms and wards by Joseph Flack (in the Kaffrarian Museum) based on Jervois' Sketch of British Kaffraria 1847-48, to a Surveyor General's compilation of about 1878, and to the Divisional Maps also compiled by the Surveyor General. For the road boundaries, occasionally used, aerial photographs were used in conjunction with these maps, and with another map in Imperial Blue Books²⁰. No accurate contemporary plan is known to exist. Jervois' Sketch was obviously the base map in most common use in British Kaffraria until 1878.

It is suggested that the areas given here, and on map 33, be accepted as the most accurate yet available for all years.

NOTE II

East London's Boundaries

1880 Proclamation 100, 1880, Cape of Good Hope Government Gazette 6045, 3/8/1880.

- 1885 Proclamation 118, 1885, Cape of Good Hope Government Gazette 7758, 29/10/1885
- 1913 Province of the Cape of Good Hope, Official Gazette, 282, 3/10/1913.
- 1936 Official Gazette, 18/4/1936
- 1941 Official Gazette, 1952, 15/8/1941 Ordinance 16, 1941, Cambridge included.
- 1944 Official Gazette, 2105, 9/6/1944 Proclamation 62, 1944, Abbotsford and Woodbrook included.
- 1948 Official Gazette, 2352, 4/6/1948 Ordinance 2, 1948, Amalinda included.
- 1953 Official Gazette, 2632, 27/2/1953
- 1955 Official Gazette, 2752, 15/4/1955
- 1955 Official Gazette, 2767, 22/7/1955

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1. Proclamation 10/5/1835 (p.41), named 19/6/1835 (p.53), in Parliamentary Papers (P.P. or Imperial Blue Book) 1836, XXXIX (279), Caffre War and the Death of Hintza.
2. Despatch No.28, 26/12/1835, from Lord Glenelg; effected in letter to Lt.Gov. 13/10/1836, P.P. 1837, XLIII (503) p.45, Caffre War.
3. Proclamation 23/12/1847, P.P., 1848, XLIII (969), pp.25, 26, State of Kaffir Tribes.
4. P.P. 1848, XLIII (969), p.28.
5. Despatch from Sir George Cathcart to Duke of Newcastle, 15/3/1853, P.P., 1854-55, XXXVIII (1969), p.9, State of Kaffir Tribes.
6. Proclamation 10/11/1853, Laws and Regulations of British Kaffraria, 1869, p.8.
7. Government Notice 26, 29/9/1863, Cape of Good Hope Government Gazette 3505.
8. Proclamation, 14/1/1848, P.P., 1848, XLIII (969), p.57, State of Kaffir Tribes.
9. Proclamation, 15/7/1859, Cape Government Gazette 3054.
10. Letter received at Government House from High Commissioner, British Kaffraria, Cape Archives, GH8/37.
11. Proclamation 12/6/1860, Laws and Regulations of British Kaffraria, 1869, pp.55-57.
12. Proclamation 21/12/1865, Laws of British Kaffraria, pp. 122-128.
13. Proclamation 2/1/1880, Cape Government Gazette 5981.
14. Appendix 2 to Votes and Proceedings of the House of Assembly Cape Parliament, A9-'66.
15. Proclamation 6/11/1891, Cape Government Gazette 7343.
16. Proclamation 14/10/1898, Cape Government Gazette 8067.

17. Proclamation 21, 12/2/1937, Union of South Africa Government Gazette.
18. Ordinance 9, 1864, 12/9/1864, Laws of British Kaffraria, p.243.
19. Census of the Cape Colony, 1875, G42-'76.
20. P.P., 1848, XLIII (969), State of the Kaffir Tribes, p.44.

APPENDIX 2

OUTLINE OF SOIL CONSERVATION AND BETTERMENT MEASURES

I. Buffalo Soil Conservation Area

In 1949 measures were adopted to control the utilization of arable land, and to limit it to areas not liable to erosion because of their steepness. Grass strips, contour banks and terraces were to be the chief methods of preventing soil wash or erosion. Provision was to be made for the effective dispersal of storm water. Crop rotation with légumes or grass leys were to be introduced. The mono-culture of cereals for more than 3 consecutive years on the same land was forbidden. Eroded land was to be reclaimed, partly by tree planting along stream banks which have suffered from erosion. Veld conservation was to be aided by concentrating on "intensive systems of mixed farming" with high class livestock. Poor quality livestock was to be culled. Only a prescribed kind and number of livestock were to be allowed to graze, in relation to the assessed carrying capacity of the veld. Rotational grazing with the regular resting of portions of the veld was to be introduced. The existing boundary between the forest and the veld was to be maintained by the eradication of encroaching bush. Veld burning was to be controlled, and limited to certain seasons partly by means of establishing firebelts on boundaries. Preservation of the water resources was to be

tackled by increasing percolation and decreasing run off by the care of grass cover, and by the reduction of transpiration through the elimination of weeds from cultivated lands. Provisions were to be made for the storage of run-off water for livestock in times of drought. Other improvements were thought necessary in order to make more efficient the work of the rivers as drainage channels and as suppliers of water for irrigation, domestic and industrial use. The indigenous forest was to be preserved as the protector of the top soil and the sponges in the head-water areas¹. Farmers having cut out most of the indigenous timber, it was emphasized that there was a need for shelter belts to protect livestock and exposed crops. Plantations in Bantu locations and on commonages were to provide wood for the inhabitants. Owners and occupiers were to be responsible for making soil conservation works and financial assistance was to be forthcoming from the Government provided these works were approved by the Department of Agriculture².

II. Betterment Schemes in Bantu Areas

The land use of the area of each location has firstly to be rationalised in accordance with the number of economic units to be provided for. Residential areas are demarcated and fenced. Arable areas are also demarcated and fenced. Fodder plots and gardens may be established. Useful forests

and plantations are also fenced off, while the rest of the commonage is retained for grazing. In planning land use, it is usual to make as little major alteration as possible to the pre-existing pattern. On the arable lands, measures are taken to protect the soil from erosion. These include the construction of six feet wide grass strips on the contour, and of access roads and the provision of flood diversion banks. Secondly, provision is made for the protection of the fertility of the soil, such as regulating the use of kraal manure, compost and fertilizers. Thirdly, the protection of the soil is extended to the introduction of unfamiliar agrarian practices such as crop rotation, the introduction of leguminous crops and of grass leys. The grazing of livestock on agricultural land is prohibited, except on conditions set by the Native Commissioner. These last mentioned measures are designed to provide a broader base for the farming economy, enabling truly mixed farming to take place.

The way the grazing is used is also being changed by the provisions of the Betterment proclamation. First of all the number of livestock has to be reduced to the assessed carrying capacity. The Bantu are encouraged to sell surplus animals, and to get rid of beasts of inferior breeding. Restrictions are placed on bringing livestock into the location. In some cases the people may choose to exclude altogether certain types of livestock, such as donkeys or goats. This may also be done

by the culling officer, who may be appointed to supervise the culling of beasts when voluntary culling of livestock has not been carried out.

Fencing the boundary of the location is one of the first works to be undertaken. The commonage is then divided into camps and rotational grazing introduced. Watering points, mostly dams, have to be provided in all camps. It is made an offence for anyone to damage fencing, or to cross it except at a gate or stile. Obstruction or defiling of watering points is also an offence.

The burning of grazing land except for firebreaks up to 20 yards wide round residential or arable land is prohibited. Veld-fire prevention becomes a statutory duty of the people. Livestock not permitted to enter betterment areas which in fact are found there, may be forfeited to the South African Native Trust. The provision of separate camps for grazing animals, and the demarcation of residential sites, in fact obviates the nightly kraaling of large stock which is responsible for much erosion.

Further general rules on the question of allocating economic units are currently in force. It is accepted that there should be some land for all land occupiers who wish to become peasant farmers, but there is little or no land for newcomers. In unplanned locations, no further new lands are allocated, and lands falling vacant are usually not re-alloted,

in order to induce the people to accept stabilisation measures, Persons accepting full economic units have to agree to be full-time peasants. Where people hold the land under individual tenure, the redistribution of land is done on the basis of those holdings, with full compensation for lands excised from the permissible arable area.

Woodlots established under the betterment scheme can be used in two ways. If they are planted by free labour from the location, the wood is free, and exploitation is controlled by the headman. If they are made with Trust labour the wood has to be bought³.

REFERENCES TO APPENDIX 2

1. That this was no new idea is demonstrated by the statement made by the Conservator of Forests, King William's Town, 75 years ago; "The conservation of streams of water has been laid down as one of the main objects of forestry in the Cape Colony." Annual Report of the Superintendent of Woods and Forests, Cape of Good Hope, 1883. G.32-'84, p.35.
2. Plan for Reclamation and Conservation of Buffalo Soil Conservation Area (Roneoed). Department of Agriculture, 1952.
3. Much of the detail in this section has been taken from the Guide to Field Officers by the Chief Native Commissioner, Cape, dated 29th March, 1956.

APPENDIX 3

WHY THE LAND USE SURVEY TOOK ITS PRESENT FORM

Purpose

One of the aims of the Buffalo Catchment Association was to compile an inventory of the natural resources of the Border Region. It was therefore desirable to examine the stage reached in the development of these resources by an examination of how the land is used now, and to do so by undertaking a detailed survey of the use to which the land is put. From the relationships between the emerging patterns of land use and the features of the natural and man-made environment that came to light in the course of the survey that was carried out, there arose a deeper understanding of how the land was being used.

Furthermore, as there was known to be considerable local variety of basic resources, as well as variations in the extent to which they were being exploited within the survey area, it was clear that a study based solely on official statistics would be inadequate. This was because the units for which the statistics were available were too large to reveal any significant and spacial variety. Official statistics would give only the overall picture and some idea of trends up to the present. A survey which would record the use of every piece of ground in the area, down to a plot of some 4 or 5

acres, would clearly provide sufficient evidence for the basic pattern of land use.

The type of survey envisaged also had the advantage of being a method through which a closer familiarity with the region might be achieved. By accounting for the use of every piece of ground the form of the country and some of the inter-relations of phenomena could be viewed, either in the field, or on aerial photographs, or by both techniques. So the routine exercise of adding one set of data to the topographical map had the dual value of an objective classification of surface use and a starting point for a general geographical study of the region.

Method

The way in which the land use survey was conducted was conditioned primarily by the time set, and by the labour force available to execute it, and secondarily by considerations arising from the desire to publish the results. Originally two years was allotted for the completion of the land use and geographical survey but this was extended by a further year because of difficulties arising from the intention to publish the results, notably the need for a base map on which to present these results.

Classification

In view of there being available only two years from 1st September 1955, it was imperative to do the necessary

field work in the current agricultural season, when the extent of summer crops could be mapped. This had repercussions on the scheme of classification used and did not allow time for a pilot survey to be organized and its results to be tested. It was decided therefore to employ the ready-made classification evolved by the World Land Use Survey Commission or the International Geographical Union¹. At an early stage, local difficulties of classification were discussed with Professor L. Dudley Stamp, and modifications of the original classification were made. It is believed that this survey is the first in Africa to be done in conformity with the plan of the World Land Use Survey, and so in such a way as to be comparable with other surveys of a similar nature.

The classification used for the **B**order Regional Survey is to be found on the key of the land use map at the end of this volume. Limited alterations to the original W.L.U.S. classification were made and concern both content and colour employed in representation. The main difficulty with the original scheme is that it is practical rather than logical, in that although most of the classes were based on land use form, others were based on land use function. Hence for example there is an overlap between classes 7 (woodland) and 6 (unimproved grazing land) of the scheme. Although class 6 is entitled unimproved grazing land, its content reveals it as unimproved natural vegetation and is described as extensive

pasture or range land, with few or no trees. On the other hand class 7 (woodlands) includes a sub-division made on morphological grounds - i.e. that of scrub. Acacia thorn scrub can indeed be regarded as woodland, but it is quite misleading to separate it from grazing land, as the latter is its dominant use. To draw a line arbitrarily where grass ceases to dominate in a plant association of savanna type, and to call the tree-dominant association "scrub-woodland" is meaningless, unless the classification is intended to be purely morphological. In order the better to relate the vegetation community with the functional use of that vegetation, all savanna woodland (bushveld), Acacia thorn-scrub and related types of scrub which were grazed or browsed by domestic animals were mapped as grazing land (veld). Plant associations used as timber or brushwood supplies, only infrequently grazed by wild game and perhaps goats, were mapped as woodland.

By the greater emphasis on functional aspects of land use, the categories of woodland and grazing are brought more into line with the other categories. Settlements and associated non-agricultural land are distinguished from farm land on functional grounds. Horticulture, orchards and perennial crops and cropland are similarly distinguished functionally. They are all types of cultivation and are not even separable morphologically. Some crops are grown as field crops as well as intensively for urban markets. Some perennial crops are

tree crops; **others are** certain fibre crops met with. As there were only a few acres of fibre crops in 1955-56, they were mapped with field crops as arable land, leaving orchards (tree crops) only in the category of perennial crops.

Although there were small patches of land which had dual use, for convenience of mapping on the scale of 1:125,000, they were indicated by the dominant use. Other aspects of classification are referred to in Chapter 11.

Field Work

The land use survey was spread over the period October 1955 to March 1956, being completed at an average rate of 300 square miles a month. The order and speed of mapping was materially controlled by the nature of the map cover and the type of agricultural landscape. For the first few months only a limited number of the 1:18,000 map sheets were available and as it was found undesirable to use maps available on the scale of 1:50,000, the area east of $27^{\circ}45' E$ was mapped by using aerial photographs supplied by the East London Divisional Council. These were taken by the Aircraft Operating Company Pty. Ltd., of Johannesburg in March 1954 on the scale of roughly 1:20,000. Also, since at the time of the survey there was no map cover of scale larger than 1:250,000 south of $33^{\circ}S$ (with the exception of 2 sheets at 1:18,000), the area between that parallel and the coast was also mapped on aerial photographs. Extending to ^a line just west of the Chalumna

River and within the East London Division, they were supplied by the Aircraft Operating Company; whereas the remainder of the region as far west as the Keiskamma River and northwards to 33°S, was mapped with the aid of Trigonometrical Survey aerial photographs (Job 336/54, taken in April 1954) enlarged to double their original scale of roughly 1:36,000. The remainder of the region was mapped on the provisional 1:18,000 topographical map series.

Map Production

At the request of the Institute of Social and Economic Research, Rhodes University, the Trigonometrical Survey compiled a topographical base map from the most up-to-date large-scale cover. The chosen scale of 1:125,000 fitted a convenient size of printing paper. Fair copies of the field maps were drawn, incorporating the notation used in the field.

These land use patterns on the various scales were reduced photographically to the scale of 1:125,000. An outline of the land use pattern was then prepared for the printers, Hortors of Cape Town, and was carefully fitted to the base map which was made available only at the end of 1957. The extension of the geographical survey for another year was made necessary by the time taken to compile the base map and, subsequently, the land use map. This nevertheless had the one advantage of allowing time for the completion of a

complementary survey of the economic aspects of agriculture. The latter survey supports several of the conclusions drawn from an analysis of the land use pattern.

REFERENCE TO APPENDIX 3

1. Van Valkenburg, S. Economic Geography, 26, 1950, 1-5.



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