SECTION B

BRITISH COLONIAL DEVELOPMENT PLANNING:

SYNOPSIS OF AGENCIES, APPROACH, METHODOLOGY AND IMPACT

PREFACE

Section A of this study set the broad framework of colonisation, specifically South African colonial development and gave a background to the Royal Engineers and their training. The study has stated that the Royal Engineers were the primary implementation arm of British colonialism and has thus concentrated on understanding the training which these men received.

Section B investigates the main fields in which the Royal Engineers influence was felt in South Africa. Many Royal Engineers went on to senior government posts and even political posts, this study will however, focus on spatial development. This section will investigate the major elements of colonial development starting with an analysis of who the development agencies were and then continuing with ports and harbour development. The section then moves on to land surveying and land tenure; following this other aspects of colonial development such as: road, railway development, architecture and construction technology are broadly addressed. This section of the study seeks to give a synoptic view of the approach adopted by the British to colonial development generally.

Section C of the study will thereafter move on to the case study.

CHAPTER FOUR

BRITISH COLONIAL DEVELOPMENT AGENCIES

4.1 INTRODUCTION

Prior to 1768 responsibility for the affairs of the British colonies was part of the duties of the 'Secretary of State for the Southern Department' and a committee of the 'Privy Council' known as the 'Board of Trade and Plantations'. In 1768 the separate 'American or Colonial Department' was established, in order to deal with colonial affairs in British North America. With the loss of the American colonies, however, the department was abolished in 1782. Responsibility for the remaining colonies was given to the 'Home Office', and subsequently (1801) transferred to the 'War Office'.

In 1801 the 'War Office' was renamed the 'War and Colonial Office' under a new 'Secretary of State for War and the Colonies' to reflect the increasing importance of the colonies. In 1825 a new post of 'Permanent Under-Secretary for the Colonies' was created within this office.

In 1854 this office was divided into two and a new 'Colonial Office' was created to deal specifically with the needs of the colonies and assigned to the 'Secretary of State for the Colonies'. The Colonial Office did not have responsibility for all British possessions overseas. British possessions in India and certain other nearby areas were under the authority of the 'India Office', and certain informal protectorates and other areas (particularly Egypt) were under the authority of the Foreign Office. In 1907 the Dominion Division of the Colonial Office was created, and from 1925 separate 'Secretaries of State for Dominion Affairs' were appointed. After the independence of India in 1947, the Dominion Office was merged with the India Office to form the 'Commonwealth Relations Office'. In

1966, the Commonwealth Relations Office re-merged with the Colonial Office, forming the 'Commonwealth Office'. Two years later, this department was itself merged into the Foreign Office, establishing the modern 'Foreign and Commonwealth Office'.

This chapter analyses who within the British colonial establishment carried out colonisation. It seeks to highlight the individual roles and functions in order to understand the scope and limitations of the Royal Engineers role. This sets the framework against which the rest of this section studies the British colonial development approach.

4.2   THE AGENCIES OF BRITISH COLONIAL DEVELOPMENT

During the first two decades of British occupation the Cape colony was administered by autocratic and predominantly military governors who tended to pursued conservative policies, similar to those adopted in Britain, which were intended to maintain an inherited social order. By the 1820s, however, the middle classes' ongoing struggle against aristocratic hegemony in industrialising Britain was undermining the status quo in the Cape as well as in the metropolis. In 1807, a campaign fought largely by middle-class evangelicals culminated in the abolition of the transatlantic slave trade for British ships, bringing labor shortages to many parts of the colony. Further British humanitarian intervention led to the amelioration of the Cape slaves' conditions during the 1820s. The colony's aristocratic governor, Lord Charles Somerset, was directly challenged by British settlers such as the journalists Thomas Pringle and John Fairbairn, who were advocates of reformist programs in Britain. Among the 4 000 "1820 settlers" located on the eastern frontier of the colony, the majority of the gentry, who had emigrated as leaders of group parties, joined in the pressure for an end to the governor's unmitigated powers. An official commission of inquiry appointed in 1823 recommended reforms that were the first step away from the old autocratic

and mercantilist system and toward freer trade under an advisory legislative council (le Cordeur, 1981).

British administration created favourable conditions for British merchants to operate from the Cape, especially once sterling had replaced the rixdollar as local currency and once British preference for Cape wine exporters had been removed, breaking the established Dutch elite's economic stranglehold. Dutch-speaking merchants soon assimilated within this English-speaking elite and, from the 1830s, both helped to finance settler capitalist expansion, based on wool production, in the eastern Cape. These merchants were also behind the complex of scientific, literary, and artistic institutions centred on the company gardens in Cape Town—institutions that did much to bolster a sense of respectability and pride in a Cape colonial identity (le Cordeur, 1981).

It was partly the "respectable" colonists' desire for metropolitan recognition that led to the "Convict Crisis." In 1848, the British government ordered that the Cape be used as a penal colony in order to appease Australian settlers, who had repeatedly complained about the "export" of British convicts to their territories. Dutch- and English-speaking commercial interests forged an alliance of classes in Cape Town to protest at this challenge to the Cape's status as a colony of free settlement. Governor Harry Smith, despite securing the support of Eastern Cape settlers, found that he could not govern effectively as long as the Cape Town elite boycotted the legislative council. He was forced to order the first and only convict ship to arrive in Table Bay on to Tasmania, saving the Cape from degradation in the eyes of its bourgeois elite. Victory in this struggle with metropolitan authority gave the colonial elite the confidence and the determination to follow Canada in securing greater powers of self-government (le Cordeur, 1981).

When representative government was granted to the Cape in 1872, it came in the form of a compromise. Eastern Cape British settlers, many of whom

supported a separatist movement which aimed to bring governmental authority under more direct settler expansionist influence, had generally argued for a franchise qualification that would include only wealthier capitalists such as themselves. But western Cape commercial and Afrikaner farming interests were generally in favour of a more inclusive franchise that would empower the entire white population. The constitution finally adopted contained the relatively low franchise qualification of £25 worth of property, regardless of race. It has been argued that the inclusion of a small minority of blacks within the enfranchised classes acted as a kind of "safety valve" for black grievances in the wake of the Frontier War of 1850–1852. The non-racial constitution served as a counter to the destabilising effects of settler expansionism which had caused the rebellion, giving blacks the aspiration to join the governing elite rather than overthrow it (le Cordeur, 1981).

By the time the British colonised South Africa, they had over two centuries of experience and were at the height of their industrial and maritime power. They had a history of colonisation which stretched back to the colonisation of Ulster and Wales. During the early seventeenth century until the 1840's; England planted new settler colonies in Ireland, Wales, the New World and the Antipodes (Home, 1997:36). Those tasked with colonial settlement had hard-won knowledge of the business and formulated a policy or 'Grand Modell' (associated with Shaftebury); its aims included commercial gain, strategic manoeuvring in the game of international geopolitics, and, later, the removal of unwanted social groups (political or religious dissenters, debtors and the unemployed). In the nineteenth century emigration was also a means of reducing population pressure at home.

During the nineteenth century the task of laying out new colonies usually fell to the governors, usually with a military background from the Napoleonic Wars.

Among these military governors were Brisbane[1] and Darling[2], Bourke[3] and D'Urban[4], some of whom gave their names to new cities (Home, 1997:37). This was most definitely the case in the Cape Colony. Being military men it is not surprising that the officers and functionaries that reported to these governors were primarily military people.

The British army in the pre Victorian era, like all armies, was used to further the foreign policy of the British Government. As the first industrial society, sources of raw materials, markets for finished goods and room for population expansion were wanted. As a consequence Britain established the 'old' colonies in North America, Australasia and the West Indies. As this empire emerged in the seventeenth and eighteenth centuries, the Royal Navy and the army were used to support the establishment of colonies, protect trading posts and suppress the activities of rivals such as the Dutch, Spanish and, most of all, the French. Britain's wars throughout this period were usually the result of imperialist rivalry, such as the Anglo-Dutch wars in 1667, or the control of colonies such as the American War of Independence.

The British army was however, also used in Britain for functions which today would be considered governmental posts; for example the policing role of the army in the United Kingdom only came to an end when Peel set up the Metropolitan Police in 1829, but it was not until 1856 that the new Police Act established a properly organised civilian police force for the entire country. The army was then only used in times of civil emergency such as the National Strike in 1926.

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[1] **Sir Thomas Brisbane** (1773-1860) Governor of New South Wales 1821-5 – the capital of Queensland was named after him.
[2] **Sir Ralph Darling** (1775-1858) Governor of New South Wales 1825-1831
[3] **Sir Richard Bourke** (1777-1855) Governor of the Eastern Cape 1825-28, and New south Wales 1831-37, where he was involved in the planning of Melbourne.
[4] **Sir Benjamin D'Urban** (1777-1849) Governor of the Cape 1834-38 after whom Durban is named. (Home, 1997:59)

The organisation and structure of the army hardly changed from the end of the Napoleonic war up until the Crimean war (1853-1856), The Crimean war revealed serious deficiencies in the organisation and management of the army. More soldiers died of hunger and disease in the Crimea than died as a result of enemy action. As a result of this, the army went through a period of reorganisation. The medical service was overhauled along lines suggested by Florence Nightingale. The supply service, which so disastrously let down the troops, was reorganised as the Army Commissariat. Buying commissions was ended, proper training instituted, and the treatment and equipment of the common soldier improved: flogging was banned, and better weapons supplied, such as breech-loading guns. It was during these reforms that specialist functions gained prominence in the army; posts such as medics, engineers, supply specialists and support staff.

From the end of the Crimean war until the outbreak of the First World War in 1914, Britain was not engaged in a war with any of its European rivals, however, it was involved in a long series of colonial wars. Some of these wars were wars of conquest, such as the Zulu war in 1879. Other wars were fought to suppress rebellions such as the Indian mutiny in 1857. An army regiment or corp. might see action in a dozen or more different places in a forty-year period. Charles Gordon's career from 1854 to 1871 typified the world wide nature of military service. When he was commissioned into the Royal Engineers in 1854, he served in Wales, he moved on to service in the Royal Engineers depot in Chatham in Kent. Next, he saw service in the Crimea, from there he served as a boundary commissioner in Turkey. He then went to China with the Allied Expeditionary force. Then he returned to Gravesend to supervise the building of defensive works from 1865 to 1871. Gordon's subsequent career consisted of service on the Danube, India, Southern Africa and in the Sudan. This mixture of combat duty, administration and home defence can be observed in the careers of other prominent Victorian officers such as Kitchener (Napier, 2005).

By 1914 Britain ruled an empire that covered nearly a quarter of the world's land surface because they effectively deployed a relatively small professional army of about two million men (about ten times the size of the modern army). The British also used large numbers of native troops, such as the Sepoys in India. The Indian army was largely made up of Indian soldiers led by British officers.

This leadership role enabled the British officers to gain considerable administrative expertise which could be put to use in other roles. Senior army officers were often appointed as governors of colonies. Charles Gordon served as Governor General of the Sudan twice, similarly, Viceroys of India were often high ranking military officers (the last Viceroy in 1947 was Lord Louis Mountbatten, an admiral in the Royal Navy). More junior officers might serve as what might now be seen as civil servants, such as district commissioners, political agents or controllers of customs (Napier, 2005).

The demands of colonial management, as well as the new technologies of the Industrial Revolution, soon created new occupational roles. New professions rapidly diversified from the three of divinity, law and medicine. As new lands were acquired, a first priority was to survey them. Secondly physical infrastructure was required and then the areas needed to be managed in terms of health, use and design. Over time therefore, the governors recruited firstly surveyors, who surveyed and demarcated the colonies, then came the engineers who installed the basic physical infrastructure of transport and utilities. The doctors, especially sanitary specialists, tried to control public health through a drastic re-ordering of the urban fabric and lastly the architects and planners. Post colonialism this professional sequence seems to continue with the valuers who specialised in marketing and selling the spaces created (Home, 1997:37).

In the early days these specialists emerged from the military and were trained by the military, especially the surveyors and the Royal Engineers, later the civilian

professions took over. When studying British colonial development it is important to remember that this was a government sponsored effort and thus largely a team effort. Although the Royal Engineers designed and constructed many of the projects described in Section C of this study it is important to remember that they were very often carrying out orders and thus, the idea to site a town was not necessarily that of the Royal Engineers, but rather part of the larger colonial government. In short the Royal Engineers and Surveyors were the professionals tasked with the development of the British colony, at the time of the case study in Section C they were military officials with military training. The British colonial development approach was however, larger than the Royal Engineers and was based on British colonial experience of earlier colonies.

CHAPTER FIVE

PORTS

5.1   INTRODUCTION

This chapter will analyse early colonial port development both generally around the British Empire and specifically two South African examples. When researching the two South African case studies it was evident that the Royal Engineers carried out much of the early survey and construction work, however they did this work under the command of the Admiralty. It is thus hard to say that the Royal Engineers developed the harbours; more a case of the Royal Engineers provided recognised professional expertise to the British in the development of their harbours. This chapter looks more broadly at the role and development of harbours in the British colonial period.

Two major South African ports are discussed in order to highlight the South African trend in colonial port development. The British established many small ports and harbours along the South African southern and eastern coastlines. This chapter will highlight the two main harbours; Simons Town and Durban however, a great deal of information is available on the other ports such as Port Alfred Harbour (1871- 1915: Manuscript: JPL Strange Collection: Johannesburg Public Library; 1862-1899: KAB VC813-817; 1874:Cory Library for Historical Research MS16929); Port Elizabeth (1864: KAB Map M1/2787; 1822: KAB Map M1/1390); Port Shepstone (1896: NAB Map M1/51).

Two regional maps of the era (1862: NAB Map M4/74; NAB Map M2/125) show the interest in detailed mapping of the coast. The Sir James Percy Fitzpaterick (1924-1925: NELM Grahamstown Manuscript 1073/1-162) and Roger Curtis' journal (1799-1802: Brenthurst Library, Johannesburg Manuscript MS.053) offer interesting accounts of the southern coastal area of South Africa and travelling along the coastline.

5.2 THE IMPORTANCE OF PORT CITIES TO THE BRITISH EMPIRE

The history of port creation in the British Empire has had a far reaching effect on world trade and development. Many of the largest cities in the world today are creatures of British colonialism. They are links in the world economy and global networks of cities, through which trade and production is organised. By 1775 London was in the view of Braudel "unequivocally the centre of the world" by then "the octopus grip of European trade had extended to cover the whole world" (Braudel, 1984).

The earliest phase of port development was the plantation colonies of North America and the Antipodes which aimed at permanent European settlements and thus formulated the 'Grand Modell'. Their port towns were planned by social theorists, like John Locke or Granville Sharp, who devised the physical form of an alternative society. The colonialists of the 'Grand Modell' did not expect to return to Britain but to make new lives for themselves under foreign skies (Home, 1997:62).

Then came the great port cities of the British East India Company; Madras (1639), Bombay (1665) and Calcutta (1690). They were the cornerstones of British power in the Far East. From these towns the British tightened their grip on the Indian sub-continent. In the Seven Years War (1756-63) they displaced the rival French and conquered Bengal. The British in Bengal administered an economy that systematically exported wealth to England. British merchants in the tropics behaved very differently from those in the plantation areas. They generally expected to make their fortunes as quickly as possible and return home before their health, and indeed their lives, gave out (Home, 1997). Europeans did not fare well in tropical climates and these areas were thus, never attractive to Europeans for large scale settlement (Acemoglu, Johnson and Robinson, 2000; Curtin, 1989; Curtin, 1998, Curtin, 1995).

The next wave of port development was for purposes of safeguarding British sea routes and opening new markets. In the Mediterranean, Gibraltar was captured from the Spanish and Malta from the French. During this period the French Revolutionary Wars forced the

British to relieve the Dutch of ports at Cape Town, Colombo and Malacca. The first British Governor of Cape Town (1797) called it "the master link of connection between the western and eastern world" (Ross & Telkamp, 1985:107; Home, 1997:63). These gains were confirmed by the Treaty of Vienna in 1815.

The next phase was that of British maritime supremacy (after the treaty of Vienna) during which they established more ports to consolidate their world-trade network. The opening of the Suez Canal (1869) cut travelling time and distance between Europe and the East, a global achievement which benefited mainly British East interests and brought Egypt, Cairo and Aden more firmly into the British sphere of influence (Home:1997). Other additions to the British Imperial port network came with the First World War. Port Harcourt (1915) was created to open up the Eastern Nigerian coal deposits. The British mandates from the League of Nations at the end of the war brought control of Haifa in Palestine, and Dar-es-Salaam in Tanganyika. At this stage the network of ports was vastly improved by advancements in land transport. Railways, roads and canals fanned out from them, opening up the hinterland to economic development. This led to plantation agriculture in areas such as India and Ceylon and mineral extraction such as tin in Malaya, copper in Northern Rhodesia, gold and diamonds in South Africa. At this stage some ports developed their own processing such as the jute mills of Calcutta and cotton mills of Bombay but mostly the ports needed unskilled dock labour. All across the empire there was a shortage of labour, which after the abolition of slavery in 1834 was solved by the importation of migrant and indentured workers. The vast populations of the Indian and Chinese subcontinents provided an ample supply of usually docile workers. India, China and Africa fed workers to their new colonial cities, such as Bombay, Calcutta, Madras, Lagos and Johannesburg through internal migration. Smaller, less populated colonies, such as the geographically remote islands of Mauritius, Fiji and the West Indies, had to organise the mass importation of labour (Home,1997:64; Walvin, 2006).

Table 22 indicates the populations of the top British colonial ports in 1911 and the annual average tonnage handled by the ports.

Table 3.1. Main ports in Britain and the British Empire in 1911 (ranked by population in thousands).	
London	4,522
Calcutta	1,222
Bombay	947
Glasgow	784
Liverpool	746
Manchester	714
Madras	518
Belfast	387
Singapore	303
Rangoon	293
Colombo	211
Cape Town	162
Penang Island	142
Durban	90
Lagos	73

Table 3.2. Annual average tonnage of vessels entered and cleared at ports in Britain and the British Empire (1907–11, millions of tons).	
Hong Kong	22.5
London	20.1
Liverpool	14.7
Cardiff	14.5
Singapore	14.2
Colombo	13.3
Gibraltar	10.3
Valletta	8.0
Aden	6.7
Glasgow	4.8
Durban	4.7
Calcutta	3.5
Bombay	3.5
Cape Town	3.4
Montreal	3.0
Victoria, BC	3.0

Source: Oxford (1914).

Table 22: British Ports ranked by population and tonnage (After Home:1997:65)

Home (1997) notes that in the early days of colonial port development municipal administration was limited to justices of the peace (appointed by the governor-general), with powers to levy a property rate and hire scavengers and watchmen, thus, following a similar structure to smaller English towns of the time. This minimalist approach was espoused by a governor of St Lucia, who in 1807 wrote that: 'Few things can be of less interest, than the interior details of a colony' (Home,1997:65). The British laissez-faire approach was contrasted with the French absolutism. "Private property and social order became so closely linked in England that government interference with the former was thought to disrupt the latter; how different this was from the situation on the Continent" (Konvitz, 1978).

The nineteenth century saw successive innovations in shipping technology; the replacement of sail by steam propulsion. Screw propellers allowed ships to travel faster, without reference to the prevailing wind. Reliable timetables of arrivals and departures could be drawn up. Steel hulls vastly increased the carrying capacity and reduced shipping costs. Freight rates fell rapidly and Britain's trade with India grew threefold. As Jan Morris (1983:148) states: "if there was one thing the imperial British knew how to do, it was to organize a port… You sailed your ship from Port Said to Aden, from Aden to Bombay, from

Bombay to Penang or Singapore, from Singapore on to Hong Kong, and everywhere there were British charts to guide you, British pilots to see you into port, British harbour-masters to accommodate you, British agents to re-provision your ship, British shipwrights to make your repairs, and ships of the Royal Navy, swinging at their anchors in the roadstead, to protect you on your way." These developments in transport led to trade being concentrated in fewer and larger ports. By 1903 the experts considered that all first-class ports in the future would need to provide for ships up to a thousand feet in length, with a hundred feet breadth of entrance and up to 35 feet depth of water (Home:1997). Such facilities required vast capital expenditures, the associated urban areas also expanded rapidly and it was acknowledged that municipal administration required overhauling; investments were made in roads, trams, water supplies and drainage systems. However, when it came to colonial ports, it was considered too an important task to be left to the new municipal authorities. A form of democratic urban government might have been conceded, but the colonial authorities made sure that they kept control over the dock development, vital as it was for British and colonial interests (Home:1997; Brookes and Webb, 1967; Welsh, 2000; Meredith, 2006).

Against this broad backdrop two South African ports are discussed.

5.3   SIMONS TOWN

The primary reason for the British occupation of the Cape was to control the harbour at Simons Town and thereby the sea route to India. Simon's Bay was established by the Dutch and named after the First Governor of the Cape of Good Hope, Simon van der Stel, who personally surveyed False Bay in 1687. He recommended Simon's Bay as a sheltered safe winter anchorage - but it was only in 1741, after many shipwrecks in Table Bay, that the Dutch East India Company decreed that their vessels anchor in Simon's Bay from May to August (Dommisse,2008).

The development of the small settlement, Simon's Vlek, was slow due to the steep topography which made overland access to Cape Town almost impossible. However stores were built, ships repaired and fresh provisions supplied. A three-gabled hospital

was built as well as a few more substantial houses (Dommisse,2008; Brock and Brock, 1976).

The change of government in 1795, during the first British occupation of the Cape, made little difference to the inhabitants of Simons Town. The British forces took possession of the buildings and other property belonging to the Dutch East India Company, but all private property was scrupulously respected. The residents of the town had long been accustomed to dealing with sailors and merchants of many different backgrounds and in fact found the change of government very prosperous. The Dutch East India Company had for many years been on the verge of bankruptcy and the paper currency had devalued considerably; British occupation saw the number of merchant ships visiting the bay increase and this was supplemented by the large number of ships of the Royal Navy, which used the port as its base during the winter months. In fact the town had never known such prosperity (Brock and Brock,1976:28).

Under the terms of the treaty of Amiens, the British forces evacuated the Cape in 1803 and government of the settlement was handed over to the Batavian Republic. War however, broke out again, even before the evacuated forces arrived back in England. Once more the British Government felt it expedient to take possession of the Cape of Good Hope and this operation was carried out in 1806. Simon's Town, as we know it today, grew more rapidly with the establishment of the Royal Naval Base there soon after the second British occupation (Wilkinson, 2000; Brock and Brock,1976:28; Dommisse,2008). The principal naval base was Cape Town; however, the navy resorted to Simon's Town every winter due to unfavourable conditions in the Cape harbour. It was soon realized that Simon's Bay afforded a secure anchorage for vessels of all sizes throughout the year. There was also a sheltered beach in the Bay where ships could be careened[1] in comparative safety to enable underwater repairs to be done and the ships hull cleared of marine growth. Careening could not be carried out in Table Bay owing to the prevailing swell, from which there was no shelter anywhere. Plans were drawn up in 1811 to move the naval base from Cape Town to Simon's Town and approved by the Lords Commissioners of the Admiralty in London and the move took place in 1814. Even before the move took place a range of buildings were built to accommodate the new naval

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[1] Careened: nautical transitive and intransitive verb to turn a boat over on its side, especially for repairs or cleaning (Encarta English Dictionary)

base including a hospital and residences for the permanent staff of surgeons (Brock and Brock,1976).

Lord Lowther's report (watermarked 1814) on the importance of the Cape of Good Hope to the Governments' world wide interests and urging a preference for establishing a naval base at Saldahna Bay instead of at Simons Town makes for interesting reading and illustrates both the strategic importance of the area and the debate about suitable harbours (D LONS/L13/1/91, Cumbria Records Office).

From 1815 to 1822 Simons Town went through an exceptionally busy period, as it became the base from which the needs of the troops and ships guarding Napoleon on St Helena were supplied. In addition the small ships engaged in the suppression of the slave trade and the vessels surveying the coasts of Africa resorted to the Bay for refitting, revictualling and the recuperation of those members of their crew, who had survived the ravages of a tropical climate (Broke and Broke,1976; Wilkinson, 2000).

Given the strategic importance of Simons Town to the British it is not surprising that early maps, plans and records exist. The 1788 plan of Simon's Bay showing the town, HMS Vestal at anchor, rocks and surroundings drawn by Charles White is one of the earliest British maps of the area (MPI 1/324/18). Two more general maps of the coastal area and the broader region are from 1802 (1802: WO 78/2719) and the general papers inherited by the War Office (WO 334/93).

Many plans of individual buildings survive, some of which are interesting as they show broader surrounding developments, plans such as those of 1838 (MFQ 1/519/17), 1880 (WO 78/4564) and the plans of Fort Knokke (WO 78/2719/1).

The number of steam ships started to rapidly increase towards the end of the century and a large reserve of coal fuel had to be built up, land was under pressure so some of the coal was stored on hulks and moored on the bay, but land was purchased at the south-east end of the naval yard, this proved to be inadequate due to the need for associated blacksmiths and other metal workers shops. In 1860 the old government-owned public wharf and jetty (which had been in service for nearly a hundred years) was acquired by the Navy in exchange it for land already owned by the Navy in Knysna. Much of the sea

bottom in front of the dockyard was reclaimed by building a sea wall. In 1858 a group of the more prominent businessmen in the town got together and formed a company and collected funds to build a dry-dock. It had been found that careening ships was a difficult and risky manoeuvre. In the end the project changed nature and eventually a slipway was built instead of a dry dock.

By the beginning of the 1900's the dock was proving to be inadequate for the larger and more complex ships of the modern navy. There was no further space available for expansion in the dockyard, as it was entirely surrounded by private property; a new site had to be found. The area selected was at the south end of Simon's Bay around the southern battery, blockhouse and powder magazine; where the Navy owned a considerable amount of land. Work on the new dockyard began in January 1901 and was referred to as the 'East Yard' in contrast to the original 'West Yard'. Construction was virtually completed in 1910 and the opening ceremony was performed by H.R.H. the Duke of Connaught on the 3rd November. The base at the southernmost tip of Africa and at the most important focal point on the trade route between Europe and the East proved invaluable to the Royal Navy during the two world wars, as it had done through the Napoleonic Wars one hundred years or more previously (Brock and Brock,1976; Dommisse,2008). Details of day to day discussions on the expansion of Simon's Town harbour and the general running of the harbour both commercially and as a naval establishment can be gleaned from the Long Papers (T1/3513) and correspondence from the era (ADM 123 156)

The railway line eventually reached Simon's Town in 1890 and furthered the development of the town and harbour. The Royal Navy was responsible for the care of the Boer prisoners-of-war in Bellevue Camp - now a golf course - during the Anglo-Boer War (1899 - 1902). The Simon's Town harbour and the Selborne dry-dock were completed in 1910 and more than 300 ships underwent repairs in Simon's Town during the Second World War. In April 1957 the Naval Base was handed over to the South African Government at which point the harbour was extended.

The first known plan of the residential settlement of Simon's Town (as opposed to military posts) is the Thibault plan of 1815; Mr Thibault, was engaged to "limit all the divisions of the ground and regular(ise) (sic) lines for the street upon the spot" because as Mr Brand

profoundly said "it is impossible to build a regular town without a plan" (Brock and Brock,1976). Thibaults letter accompanying his final survey clearly explains the geographical problems of the settlement:

Appendix: Observations on the building of the houses of the Town of False Bay

The little distance that lies between the sea and the lower slopes of the mountains of this bay have forced the inhabitants to cut into the ground in order to level it so as to find a suitable surface on which to build the house. All these excavations have formed a street, which, 30 years ago, was so narrow that a carriage could hardly pass along it without risking falling into the sea.

The steepness of the terrain allowed the inhabitants at that time to excavate the ground only as far back as the extent of their houses; so that a space of only 6 or 7 feet remains between the houses and the mountain side.

The new houses now built have contributed by the fresh excavations of earth to enlarging considerably the only street there is at Simon's Bay. These excavations are made only according to the needs of the inhabitants and the manpower their means allow them to employ, and this single existing street is not more than 30 or 40 feet broad at the most. Beyond is the natural slope of the excavation dumps, which extend to the sea and which have, as yet, no stability. The building of new houses can take place only on this dumped ground, which is more than 40 feet wide; and even supposing a willingness to build on piles, these piles could not be driven except into shifting sand that is yet unconsolidated. As the length of these piles would increase with the depth of the houses (the distance between the front and back of a house), this would be extremely costly, and instead of building in stone, there would be only wooden houses, ill suited to the climate, and the sea-shore would become the recipient of garbage, which, added to that of the old houses, would make the new ones very unhealthy.

Some houses are today built in such a way that, being close to each other, the excavation of new ground is impracticable. Others, where it would still be possible to excavate or cut into the earth, have other houses above them so placed that, the very little space between the upper and the lower being divided in half, the result of excavating the lower half would be that the house on the higher ground would collapse on to the lower one, and that would surely be a very nice affair. It is true that there are few houses in this situation, and that happily the mountain sides are extremely coherent and composed of heavy soil, rocks and debris which even the rains can scarcely separate.

It can be seen from these observations that there is for a long time no possibility of establishing another row of houses opposite those in existence, and that even if there were ground wide enough upon which to build, the land has not acquired, and would not for a long time acquire, the necessary firmness and density for such buildings. But while waiting for the time when this would be possible, it seems to me that it would be possible to obtain for the inhabitants of Simon's Bay a means of drawing water without being obliged to walk the whole length of the Town to procure it. If the government were to instruct the present director of the pumps (waterworks) of Cape Town to consider briefly this useful project, I should be delighted to see it accomplished. It would not cost much as the distances are short, and it is a benefit by which the government would overwhelm the inhabitants of Simon's Bay, after having built a church for them.

L.M. Thibault, Inspector
of Public Buildings.
17 April 1814.

(Brock and Brock:1976:32)

A number of maps and plans of Simon's Town (see figures 23-28) show the development of the town. It began in an organic manner with more emphasis on the dock planning than the town and has always been constrained by the mountain and sea; the town design thus, does not follow any of the normal patterns of development. The town has been established in the most inconvenient location from a settlement point of view with extremely difficult mountain passes linking it to Cape Town, it is however, the most important settlement in South Africa from a colonial strategic point of view and the harbour and its command of the Indian trade route are its *raison d'être*.

The bay is surrounded by gun positions in the British tradition of stone built forts, barracks and gun stations. It is a well protected and fortified harbour. Many maps, plans and records remain of the defensive positions and structures. The records of the Colonial Office, Commonwealth and Foreign Offices contain large collections of confidential correspondence (1878: CO 537/193) about the defence of Simons Town. The four sheet drawings of the batteries at Simon's Town dated 1806 (MPH 1/694); the gun positions
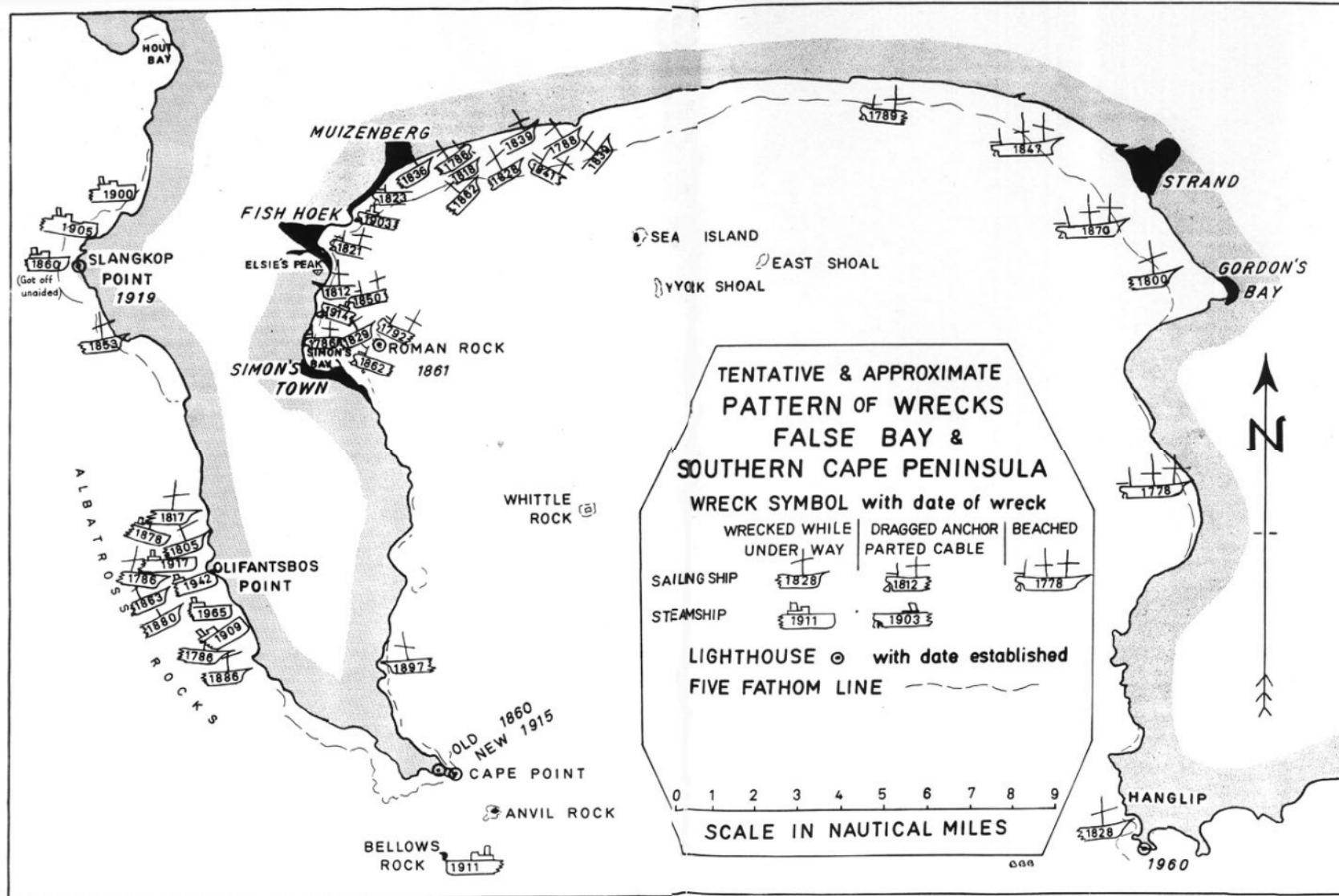
(1899:WO78/4081), the battery and magazine map of 1803 (MR1/1297/2) and the Royal Engineers' 1891-1894 plan of War Department Property and position finding station (MPHH 1/533) being a few good examples.

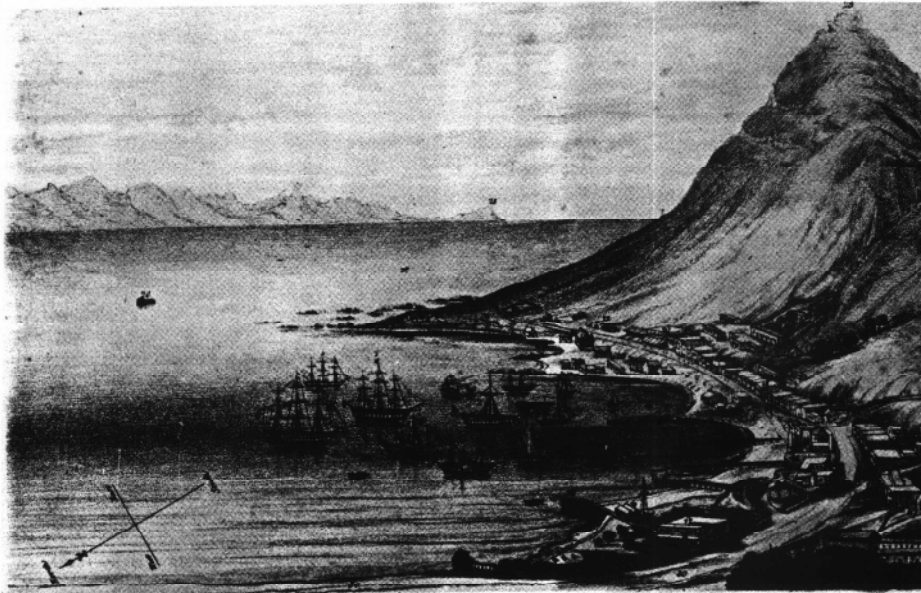View of Simon's Town from the slopes of Red Hill, by Sir Charles D'Oyly, c1833

Figure 23: Simon's Bay (Brock and Brock,1976)

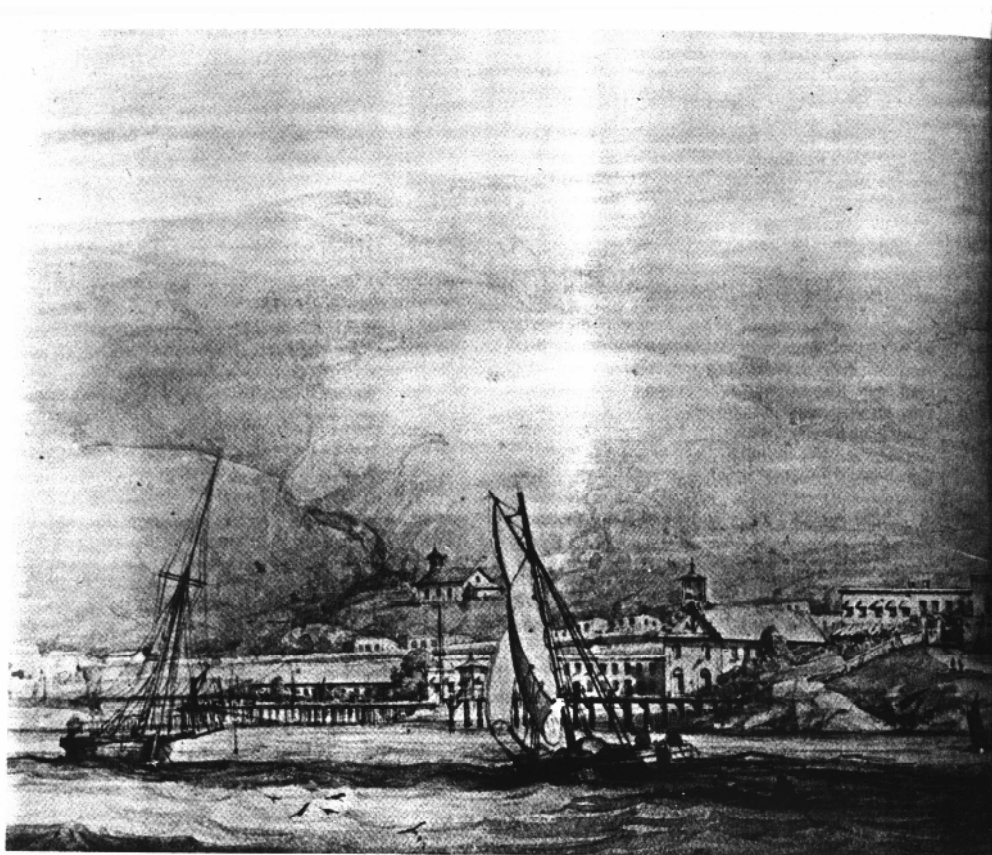**Figure24: Chart of Ship Wrecks around the Cape Peninsula. (Brock and Brock,1976)**

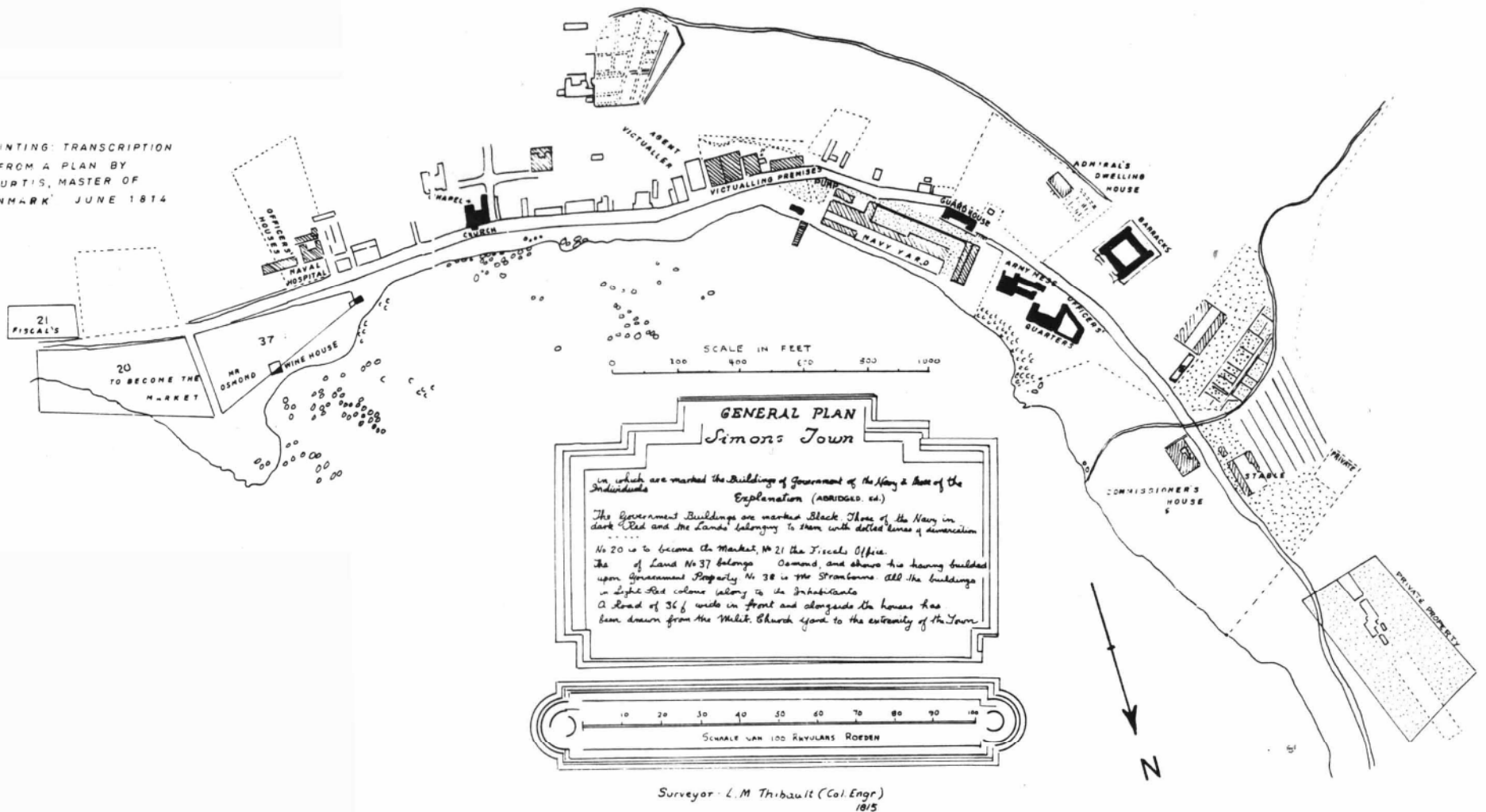**Figures 25 and 26: Paintings of Simon's Bay (Brock and Brock,1976)**
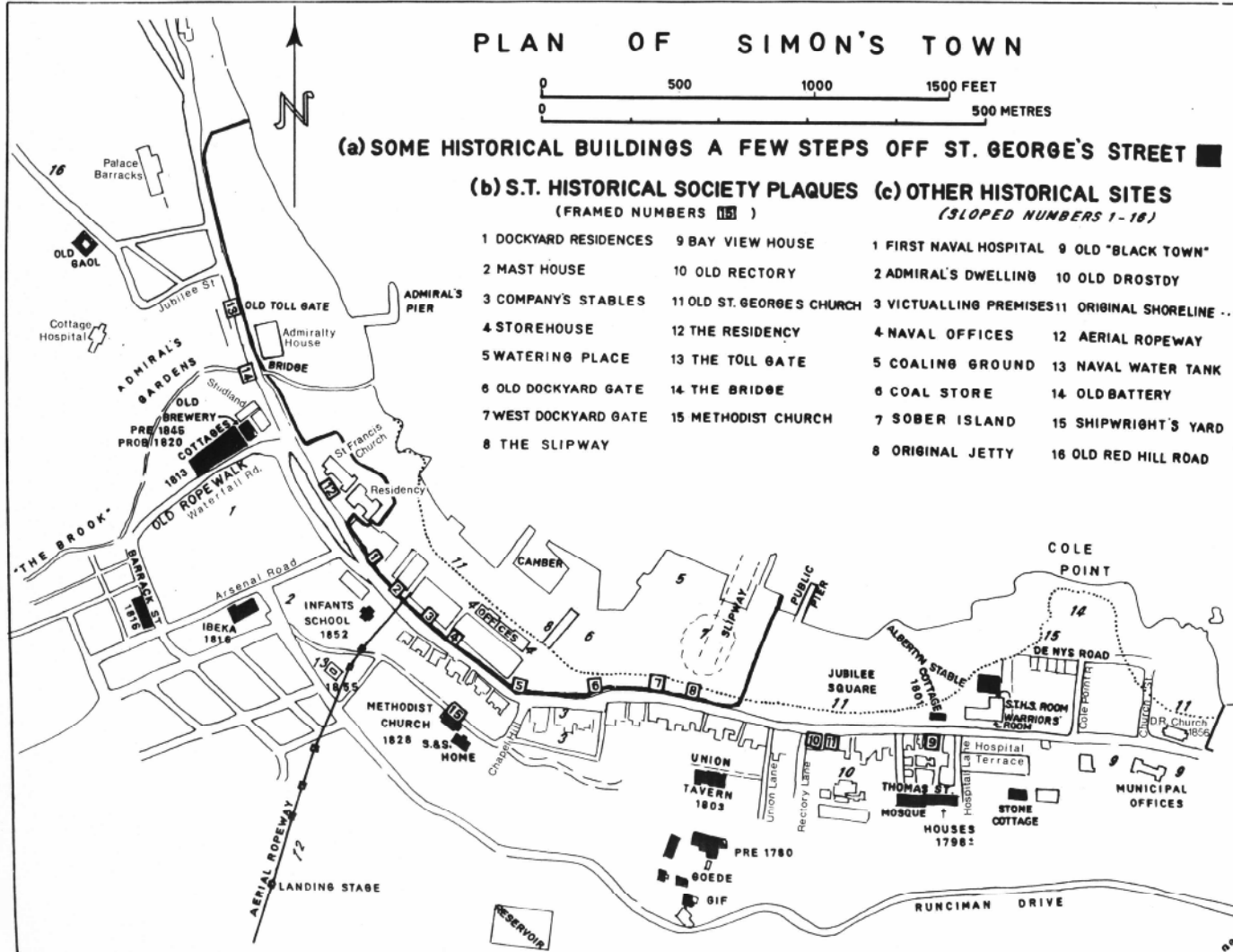
Figure 27: General Plan of Simon's Town 1815 (Brock and Brock,1976)

Figure 28: Plan of Simon's Town showing Historic Buildings (Broc k and Brock,1976)

5.4 DURBAN

As previously stated in chapter two page 38, the settlement at Durban was founded by Lieutenant Farewell, Henry Fynn and their group of travellers who landed at the Bay of Natal in 1824. Please refer to chapter two for the background history.

The first active engineering venture of any sizable nature was undertaken by missionary, Captain Allan Gardner, who laid out a plan for the embryonic settlement in 1835. The plan however, was never implemented and remained on paper only. The actual laying out of Durban was undertaken between 1838 and 1840 by George Christopher Cato under the commission of the Republic of Natalia *Volksraad* (people's council). Reminiscing in 1882, Cato recalled that when the *Volksraad* ordered him to layout a town with *erven* (stands) of 100ft by 150ft he refused. His site was accepted, but the measurement of *erven* was shelved and the people could not wait, "but began to squat and build as it took their fancy. On this the Government found they were losing the price of sale of the *erven*. They then ordered me to go on with the survey with 100 ft streets. The difficulty was that every squatter wanted his shanty to fall into an *erf* (stand). One man threatened to 'pluck me like a goose' so took to my wings and flew away from him" (Lynsk, 1982:3).

In June 1840 the first public sale of Cato's lots took place followed by a second in October 1841 – payment was however, never forthcoming. The earliest buildings were in the centre of the town by the Market Square bound by Aliwal Street, West Street, Smith Street and Gardiner Street. When Cato originally planned the town the western end was a swamp, however, after British occupation and the demise of the Republic of Natalia in 1842, Dr William Stanger, the first Surveyor General and his staff set about remedying the situation. Cato recalled that he recommended to Stanger that the Government should make free grants of the 'West End' *erven*, 'on condition that the same were built on and drained before titles were issued' (Lynsky,1982:3).

Cato surveyed and marked out the *erven* and most were taken by soldiers discharged from the garrison. In 1846, Thomas Okes, a surveyor, made a general plan of the town which consisted of an area of more than 7 000 acres (Figures 29 and 30). At this stage the majority of the inhabitants lived in shacks or shanties; roads were sandy tracks and there

was no water supply or drainage other than a few shallow unhygienic wells. Bishop John Colenson observed in 1855 "…indeed if the Dutch had founded the town of Durban, as they did that of Maritzburg (Pietermaritzburg), they would long ago have had the Umgeni pouring its beneficent streams through every street and bringing health and cleanliness to every door. How long will it be before the public spirit of Englishmen will achieve this?" (Lynsky,1982:5). Initially the 45th Regiment supplied most of the labour in the town and were responsible for creating a bridge and ditch between the fort site and the town, which was unfortunately washed away the same year. Later the town's people banded together to drain and bridge the swamp across West Street that divided the 'East End' and 'West End' of the settlement. In 1854 the Council turned its attention to the foul water supply and a town pump was installed and made available for the use of the public. The town pump was situated on what is today known as Old Well Court between Smith and West Streets (Lynsky,1982; Duminy and Guest, 1989; Stuart, Webb and Wright, 1976).

The rapid suburbanisation of Durban was a very British feature. Even before pressures of land shortage and high prices forced home builders away from the centre of town it was fashionable to live on the Berea hills. In 1855 the Council decided to lease 150 acres on the Berea and appointed Robert Sellars Upton to survey it. The lease of the town lands on the Berea caused him endless problems. The common method of survey in the thick Berea forest was for Upton to climb a large tree while his Zulu assistant would do likewise some distance away. He would take a reading with his pocket compass, and then flags would be secured to the respective trees. A path would then be cut through the bush between two points and survey pegs hammered into property boundaries. "Finding the bush pegs afterwards was always a matter of difficulty; should a tree stump be in the way, what more natural than for the settler to erect his beacon a foot or two clear of it" (Lynsky,1982:6). Of course a tree would always be in the way as they were the corner beacons.

During the 1860's and 1870's the issues which arise in the Council minutes reflect concerns with un-surfaced roads and approaches to bridges washing away, during this era Berea and Western Embankment Roads were surfaced, the eastern *vlei* (marsh) was also receiving attention. The harbour engineer, John Milne, suggested a method of draining the *vlei* through Cato's Creek to the bay. After some delay Milne and Captain Grantham from the Royal Engineers, aided by the labour of the 45th Regiment, started work on the drain

which was later named 'Milne's Drain' in his honour. The 1860's also saw the establishment of many ornamental gardens; Market Square, Albert and Victoria Parks. Water supply continued to be an issue; in 1878 Durban's public wells with hand pumps totalled 18 and produced 47 049 imperial gallons of water daily. Durban existed entirely on public wells and rainwater tanks. Durban's position with regard to its water supply was a serious problem at this stage was in dire straights. In 1879 the then Mayor made arrangements with the Natal Government Railway for water to be brought by railway tankers from the Umgeni River to a siding in Pine Street where it was sold for a penny a bucket – probably the most expensive water ever supplied in Durban. The year before the Zulu War (1879-1884), the Council placed the well boring operations entirely under the control of a Mr Currie; luckily his first borehole site below the Botanic Gardens yielded 50 000 gallons a day (Council minutes; Lynsky,1982; Archives University of Natal; Stuart, Webb and Wright, 1976).

Durban's fortunes changed dramatically after the Zulu war, the disintegration of Zulu power meant that the region could be opened up to European commercial farming and the sugar industry emerged. Suddenly Durban was a valuable commercial harbour and consequently there was an interest in its development. Until that point the British had occupied Durban more to prevent the *Boers* from obtaining a port, and hence a trade route to Europe, than as a port for their own purposes.

In 1881 Durban harbour was still inaccessible to ships; passengers landed in boats over the bar and through the surf. Harry Escombe, destined to become Prime Minister of Natal, had long recognised the need to open the harbour and allow Durban to realize its full potential – it was already 'the great forwarding station of Natal and … the seat of the sugar industry.' In 1881 he was appointed chairman of the infant port authority, the Natal Harbour Board (1877:KAB Map M1/2834; 1877: KAB Map M1/2835; 1867: KAB Map M2/476; 1889: NAB Map M2/90; 1887: NAB Map M2/374; 1854: NAB Map M3/261; 1875: NAB Map M3/319; 1871: NAB Map M5/54; Twyman:1991).

Other advances of the late 1800's were the construction of an earthen dam on the Umbilo River and the establishment of a gravitational water supply. The Council was still discussing sewerage in 1883 when a recommendation was made to install a Victorian pneumatic system (a Shone's system) augmented by a pail system, this went before the
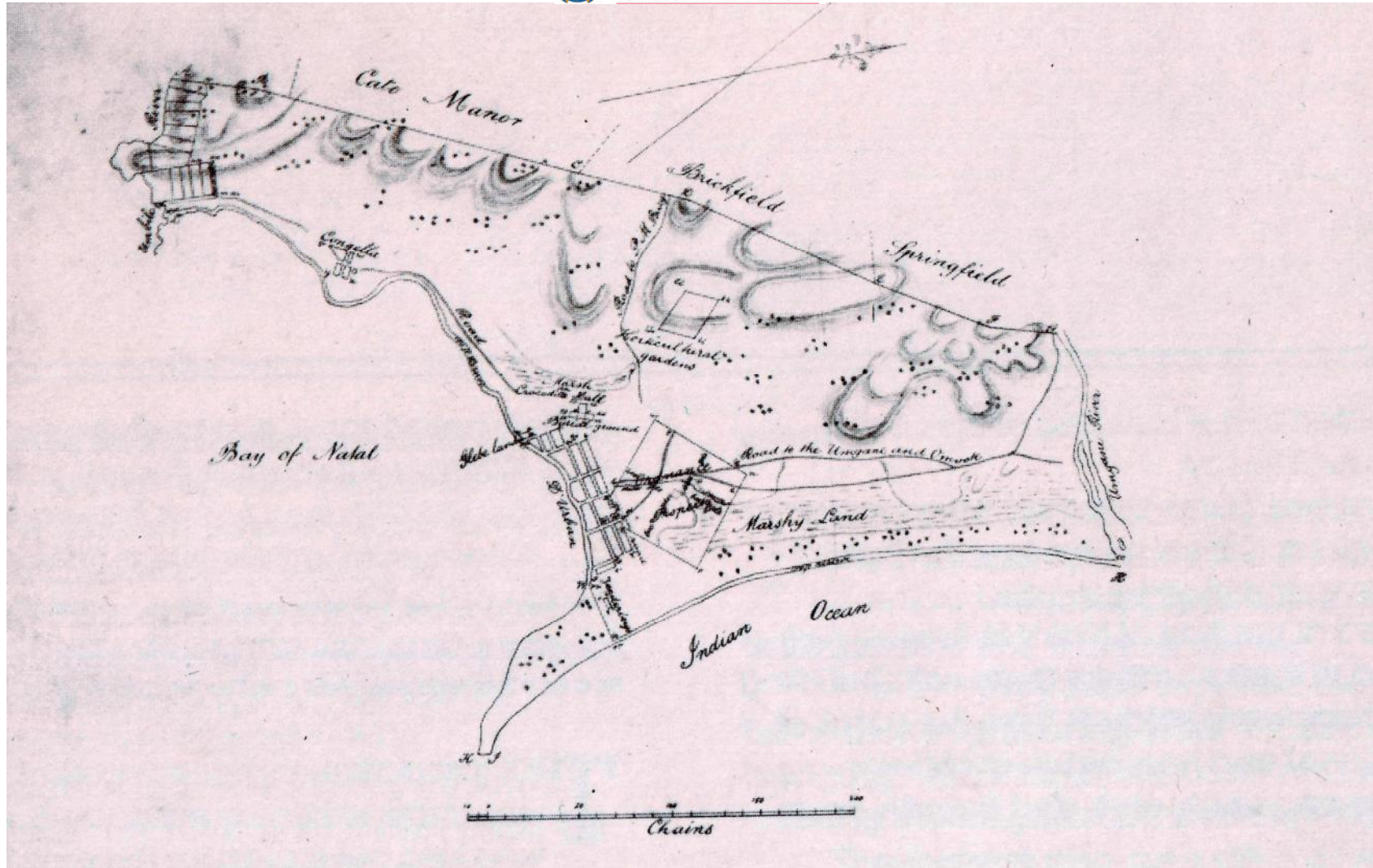
Council for a decision in 1888 (Lynsky, 1982:24). Figures 31 to 33 show how the town and harbour developed.

Figure 29: Thomas Okes' General Plan of Durban 1846 (Lynsky,1982:1)

Figure 30: This Map is an enlargement of a section of the map on the previous page: Thomas Okes' general plan of Du rban in 1846 (Lynsky:1982:1)

Figure 31: Borough of Durban 1892 (Lynsky:1982:inside cover)

Figure 32: Enlargement of section of Map cited on next page

Figure 33: General Plan of Durban Central Business District (Source: Surveyor General's Office)

5.5 CONCLUSIONS

The reason the British captured Simon's Town and Port Natal was strategic, they didn't want Napoleon or the *Boers* (respectively) to establish a harbour and hence a trading route to Europe in competition with their own. Strategic control of harbours was vital to the British. Later Simon's Town became a major naval yard and a vital port in the British defence of the Empire. Port Natal became important as a commercial harbour and became a major export harbour. The two ports thus, have fundamentally different purposes, both are however vital elements in the British colonial strategy. In both cases commerce and trade were at the heart of the port development, in the case of Durban this was a direct link as it was a commercial harbour, but even in the case of Simon's Town the need for a naval defensive post was to protect the trade routes with India.

Secondly much of the early engineering work in the port settlements and harbour construction was carried out by the military, although the level of services provided were rudimentary. If one analyses the copious records of King William's Town, it is reasonable to imagine that the level of services available in the fort for the troops was far higher than those provided for the average citizen, King William's Town records clearly indicate that latrines, water supply, ventilation and layout were all addressed in fort designs and encampments; in fact designs still exist for a bowling alley – yet the services in early Durban were more primitive than those provided in early *Voortrekker* towns (which only had water furrows along streets and pit latrines).

Thirdly port development and infrastructure were so important to the empire that the harbour authorities were set up independently from the Town Council, harbours were not subject to civil administration, they were retained under the colonial government's control. The main harbours in South Africa not only follow the colonial trend but they also linked South Africa firmly into the British colonial network and economy.

CHAPTER SIX

MAPPING, SURVEY AND LAND TENURE

6.1   INTRODUCTION

As soon as the British landed at the Cape they were acutely aware of the lack of maps, they wrongly assumed that the Dutch had not mapped the area. The Dutch in fact had produced numerous wonderful maps, many of which are today in the Netherlands, they were however, taken back to Holland prior to British occupation. Once the British took control they immediately set about mapping the area, beginning with the creation of accurate navigational charts of the coast line.

"The first engineering work called for in any developing country arises from the need for people to move around, to explore unknown territory, to carry men, women and goods from one place to another. This means vehicles, roads, bridges and mountain passes. Communication by transport – and South Africa has been no exception. But, before any of this can happen properly, it is necessary for the rivers, mountains and plains to be measured and for accurate maps to be drawn, so that the roads, bridges and passes can be built in exactly the right places and designed correctly" (Bozzoli, 1997: xiii).

There were a number of reasons why land surveying and mapping were vital to British colonial expansion: firstly for military purposes; maps formed the base of all intelligence, strategic and tactical decisions, supporting the planning and execution of all battlefield functions. The Cape was occupied as a strategic harbour on the route to India it is, thus, not surprising that the early efforts centred on coastal charts and harbours – most notably Simon's Town. Secondly maps were necessary to describe and delineate Britain's domains, to define the colony, its size and boundaries. Thirdly mapping was necessary as a process of exploring - of surveying and recording the rivers, mountains and plains of the new territories. Finally mapping and survey were the basis of land tenure, one of the most powerful colonising tools.

6.2   BACKGROUND

After two centuries of British overseas expansion, the nineteenth century confirmed Britain as a world industrial and maritime power, with a vast empire to manage. Firstly the colonies needed physical planning, colonial ports and towns needed to be established and these tasks often fell to governors, usually with a military background from the Napoleonic Wars. Home (1997:36) cites Brisbane, Darling, Bourke and D'Urban as examples, many of whom gave their names to major colonial cities. Home (1997) goes on to explain that the demands of colonial management, as well as the new technologies of the Industrial Revolution, soon created new occupational roles. New professions rapidly diversified from the traditional three of law, medicine and divinity. It was also a time after the Reform Act (1832)[1], when a new breed of professional government inspectors arose, committed to improvement, demanding state intervention, and deepening government's hold of civic society. Home argues that the different professions associated with British colonial expansion each enjoyed their 'Kondratieff waves' of influence; first the land surveyors surveyed the new empire primarily between 1820 -1870, then engineers both civil and military installed the basic physical infrastructure in the period 1850 -1900, then the doctors took over as sanitary specialists in the provision of public hygiene (1880 -1930). Public health often had a very physical form, such as slum clearances and redevelopment projects. The last wave prior to the end of colonialism saw the rise of the architects and town planners who in the period from 1910 -1960 brought in ideas such as the garden city, suburbia, zoning schemes, a legal framework to manage development and land mark buildings symbolic of the empire. Ironically these waves of colonial professionals mirror any modern capital works project, first you survey, then you construct and finally you need

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[1] Reform Act 1832 – The full title is An Act to amend the representation of the people in England and Wales (2 & 3 Wm. IV, c. 45). This was the first time universal manhood suffrage was proposed. Thomas Rainsborough declared, "I think it's clear, that every man that is to live under a government ought first by his own consent to put himself under that government." More conservative members disagreed, arguing instead that only individuals who owned land in the country should be allowed to vote. Statutes passed in 1430 and 1432, during the reign of Henry VI, standardized property qualifications for county voters. Under these acts, all (male) owners of freehold property or land worth at least forty shillings in a particular county were entitled to vote in that county, the vast majority of individuals were unable to vote; the size of the English county electorate in 1831 has been estimated at only 200,000. Although the Reform Act of 1832 did not give the vote to all men it was the beginning of the move towards true democracy and greater accountability in England. Other reform measures were passed later during the nineteenth century; as a result, the Reform Act of 1832 is sometimes called the First, or Great Reform Act.

on-going management and maintenance. In short the empire's development was a vast state funded capital works programme which operated for years, covered vast territory and developed a phenomenal physical infrastructure around the colonial world. In keeping with the trend highlighted by Home some of the first colonial funded professional work carried out in South Africa was mapping.

6.3   MAPPING THE COLONY

The Royal Engineers' first contact with South Africa came when the Cape was occupied by British forces in 1795, ending nearly a hundred and fifty years of Dutch rule. For the seven years' duration of the occupation, a small detachment of Royal Engineer officers carried out fortifications, territorial and coastal surveys, utilising the few and in many cases unreliable maps and plans at their disposal, and producing new maps of their own. Among the instructions to Lord Macartney (1737-1806), when he took office as the first civilian governor of the Cape Colony in 1796, was an order to "cause a survey to be made of … rivers, landing places and harbours" (Bergh and Visagie,1985:34). The fortifications and surveys were largely the work of Captain James Carmichael Smyth, Captain George Bridges and Lieutenant Henry Smart. Of these men Smyth (1779-1838) then aged eighteen, soon demonstrated his talents as an engineer and an administrator, becoming *aide-de-camp* to the governor, Sir Francis Dundas (1759-1824) in 1800, and commanding the Royal Engineers and acting as Colonial Secretary in the early years of the Second British Occupation of the Cape in 1806. He was responsible for mapping, coastal surveys and fortifications and he gained considerable knowledge of the interior of the colony, providing information for Aaron Arrowsmith's map of the Cape Colony, 1805, which was dedicated to him (Garson:1992).

The lack of maps and plans which would have provided a basis for the Royal Engineers to work from gave rise to the belief that the Dutch had made no maps of the colony, and that the first serious attempts at mapping the Cape Colony were made after the British arrival; this is however incorrect as in the 1950's Cornelius Koeman, an eminent Dutch historian of cartography, discovered a portfolio of nearly a hundred maps and plans in the Ordinance Survey Archive at Delft in the Netherlands. There he found a fine collection of manuscripts drawn between 1784 and 1791, most of them having been commissioned from skilled Dutch surveyors by Cornelius Jacob van de Graaf (1734-1812), governor of the Cape

Colony from 1785-1791 and himself a military engineer. On being recalled to Holland to give account of his alleged maladministration of the colony, he took the collection with him. Another important set of eighteenth century maps and plans which may have been of use were spirited away from the Cape in 1795 on the death of the man responsible for their compilation, Robert Jacob Gordon (1743-1795). These are now in the Gordon collection of maps and plans at the Rijksmuseum in Amsterdam (Garson:1992:2).
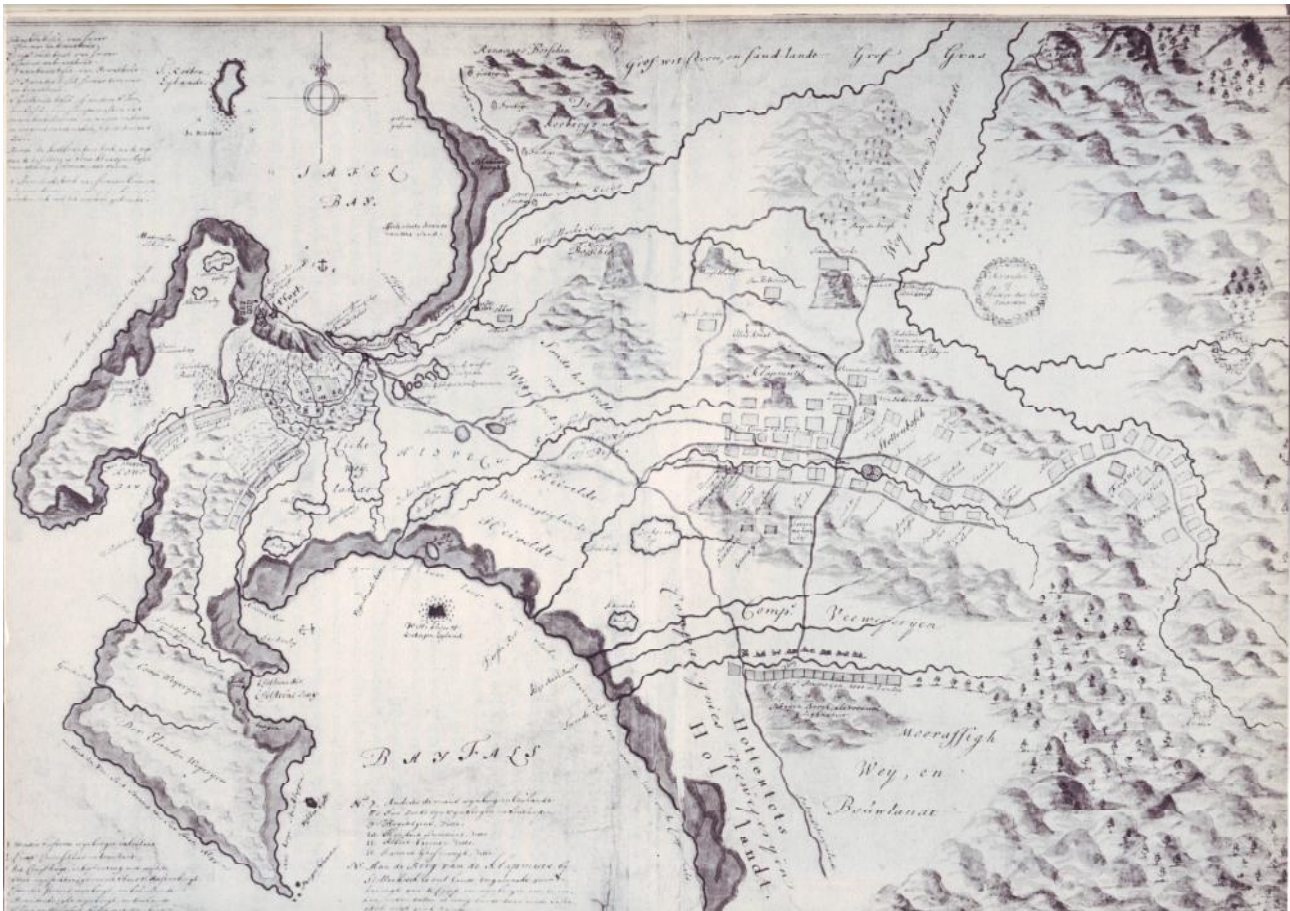

Figure 34: the Oldest Known Map on which Stellenbosch is depicted as an already developed community. The van Riebeeck Society date it between 1688-1690 (Smuts,1979:66)

Figure 34 illustrates the level of detail on early maps and gives an idea of the limited extent of the initial Colony. The map is pictographic in many respects as the villages depicted are not in scale with the map base.

With the Second British Occupation of the Cape in 1806, an equally small group of Royal Engineer Officers arrived, under the command of Captain Smyth on his second tour of duty to the Cape, which lasted until 1808. He was replaced as commanding officer by Captain Henry Smart, who was at times, until 1818, the sole engineer in office. By then the

steadily growing need for the fortification of the eastern frontier against the dispossessed Xhosa brought to the colony five Royal Engineer Officers under the command of Major William Cuthbert Holloway. By the time of the second occupation the training of the Royal Engineers had been improved by the creation of the Royal Engineer training base at Chatham. In addition to the training provided at Chatham, practical experience in topographical work was gained at the Ordnance Survey at Southampton, by then a well-established institution in which the Royal Engineers were prominent participants. Obviously the maps of this era centre largely around the eastern frontier and cover both terrain mapping for military purposes and detailed plans of buildings at the various forts – King Williams' Town being notable for the vast number of plans which survive at the Cape Archives; everything from broad regional surveys to plans of privies (toilets) and even a bowling alley. Frustratingly once British colonialism ended many of the records were taken back to Britain and seem to have been split and housed at a number of different locations such as the House Guards in Whitehall, The Royal Engineers Establishment at Chatham, the Public Records Office and the British Library. Locally the plans and records are equally fragmented and reside in the Cape Archives, the Grahamstown Museum, the Cullen Library at the University of the Witwatersrand and a number of private collections. It is apparent from bibliographical enquiry that the Royal Engineer maps and plans of the colonies were on the whole not published as separate entities neither as sheet maps nor in atlases. There were however, some notable exceptions relating to South Africa. Sheet maps by Henry Hall of the Royal Engineers' Department and a beautiful map of British Kaffraria (sic) by Lieutenant William Jervois, were compiled in South Africa and printed in England (Garson,1992). The maps and plans were predominantly for two purposes, firstly they illustrated official reports and articles in professional journals and monographs, of which the Royal Engineers were prolific writers and secondly they supplied accurate information to the map-makers of the day who were producing maps of southern Africa. These cartographers were reliant on information from a number of sources; the writings and sketches of colonial officials, travellers and missionaries such as John Barrow, William Burchell, Thomas Baines, Hinrich Lichtenstein, Robert Moffat, Christian Latrobe provided a rich resource to draw from. But it was without a doubt the Royal Engineers whose communications on cartographic matters would have been the most accurate and workmanlike, based as these were on scientific geodetic principles (Grason,1992). The expansion of the Cape Colony and quality of mapping in the era is clearly seen in Figure 35.

Figure 35: Early Map of the Cape Colony, Orange Free State and Transvaal 1849

Source Public Records Office, Kew MR 1/144(8)

While some of the earliest British systematic and complete surveys were made in Egypt after the battle of Tel el Kebir (1882), the Anglo Boer War provided impetus for systematic mapping in the British Army. In 1899 the only available maps on the *Boer* republics were a few sketches of farms. The first mapping section, sent out in that year, comprised two Royal Engineer Officers, four non-commissioned officers (NCO's) and a sapper. By the end of the war there were four survey sections and three mapping sections in South Africa. During the war Captain Charles Close (later Aden-Close) Royal Engineer oversaw the first complete map reproduction in the field – surveying, drawing and printing maps – by the British Army (Jacobs and Smit, 2004:34).

At the outbreak of the Anglo Boer War the British possessed maps on the scale of twelve and a half miles to the inch for the Cape Colony, the Orange Free State and part of Natal. These maps were issued to their army in South Africa. For the northern part of Natal two military maps were available. These however, were known to be inaccurate and hopelessly out of date (Jacobs and Smit, 2004:34). Although the Anglo Boer War falls at the end of the time frame of this study it is useful to note the progress to this point as well as the reaction of the British military to the lack of maps.

Figures 36 - 42 provide an illustration of the many regional and route maps drawn by the Royal Engineers, they illustrate both the skill of the map makers as well as the pragmatic approach to the mapping of new territories; since the level of detail along major transportation routes contrasts with the lack of detail in the interior or in many places blank spaces occur on maps. The maps of the Eastern Frontier forts and signals clearly show the military purpose they were intended for. They also clearly illustrate the scientific approach to warfare as the Royal Engineers designed a number of small isolated forts with a well established communication signal system – they were defending a frontier for farming expansion which was very different from the European fortified towns. This was orchestrated and tactical expansion and is discussed in the case study.

Stone (1988) makes an interesting observation in his paper "Imperialism, colonialism and cartography"; he distinguishes between imperialism and colonialism. In Stone's view imperialism began long before colonialism and occurred when Africa entered the world trade system; firstly with the Arab trade routes but notably for this study with Europeans as

part of the slave trade and the trade in ivory and precious metals. Colonialism on the other hand was the direct settlement and control of African states which occurred much later and lasted only a brief period, the level of control and hence the detail required of cartography was very different in each phase (Stone:1988). It is thus, not surprising that the mapping of Africa began as coastal charts, many of the early maps of the interior marked legendary areas such as King Soloman's mines being based on word of mouth rather than fact, later mapping became more accurate but was only partial in coverage; systematic and detailed coverage in terms of world mapping is a relatively modern phenomenon.

The pre-colonial phase was characterized by its use of the Ptolemaic concept of mapping[2], and was centred on discoveries like finding the source of the Nile. The turning point in cartography is located in the "age of reason". A scientific approach leads to the removal of many legends and assumptions by the innovators who achieved marked gains in accuracy and were famous for their blank spaces or areas of the map devoid of any information, in other words the information given was accurate but limited to what had been surveyed, the rest of the map was left blank. The change to the colonial system of mapping saw marked changes due to the need to establish administrations on the ground, mapping was necessary to define districts, establish routes, define colonial borders and an unprecedented amount of detail was applied to the counting and mapping of people and resources – these maps were however, often drawn up by administrators and were very inaccurate and patchy, the few Royal Engineers who were in the country were used for more important tasks such as laying out of towns and infrastructure development. The first major mapping in South Africa was brought about by the Anglo Boer War – it was a military need which drove the accurate mapping of South Africa.

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[2] The Ptolemy world map is a map of the known world to Western society in the 2nd century A.D. It was based on the description contained in Ptolemy's book Geographia, written circa 150. Although authentic maps have never been found, the Geographia contains thousands of references to various parts of the old world, with coordinates for most, which allowed cartographers to reconstruct Ptolemy's world view when the manuscript was re-discovered around 1300 AD.

Perhaps the most significant contribution of Ptolemy and his maps is the first uses of longitudinal and latitudinal lines and the specifying of terrestrial locations by celestial observations. When his Geographia was translated from Greek into Latin and introduced into Western Europe at the beginning of the fifteenth century, the idea of a global coordinate system revolutionized European geographical thinking and put it upon a scientific and numerical basis.

Figure 36: Port Natal to Colesberg: Sketch showing the route travelled between the Natal and Cape Colonies by the Commanding Royal Engineer on a tour of inspection from sketches made by Lieut. Jervois (RE) Signed by J.Reid 25th March 1847 (Garson,1992:41)

Port Natal to Colesberg

Figure 37: District of Graaff-Reinet: Sketch map showing the ground between the northern boundary of the Cape colony in 1822 and Kuruman. Signed by Lt. Bonamy (Garson,1992:11)
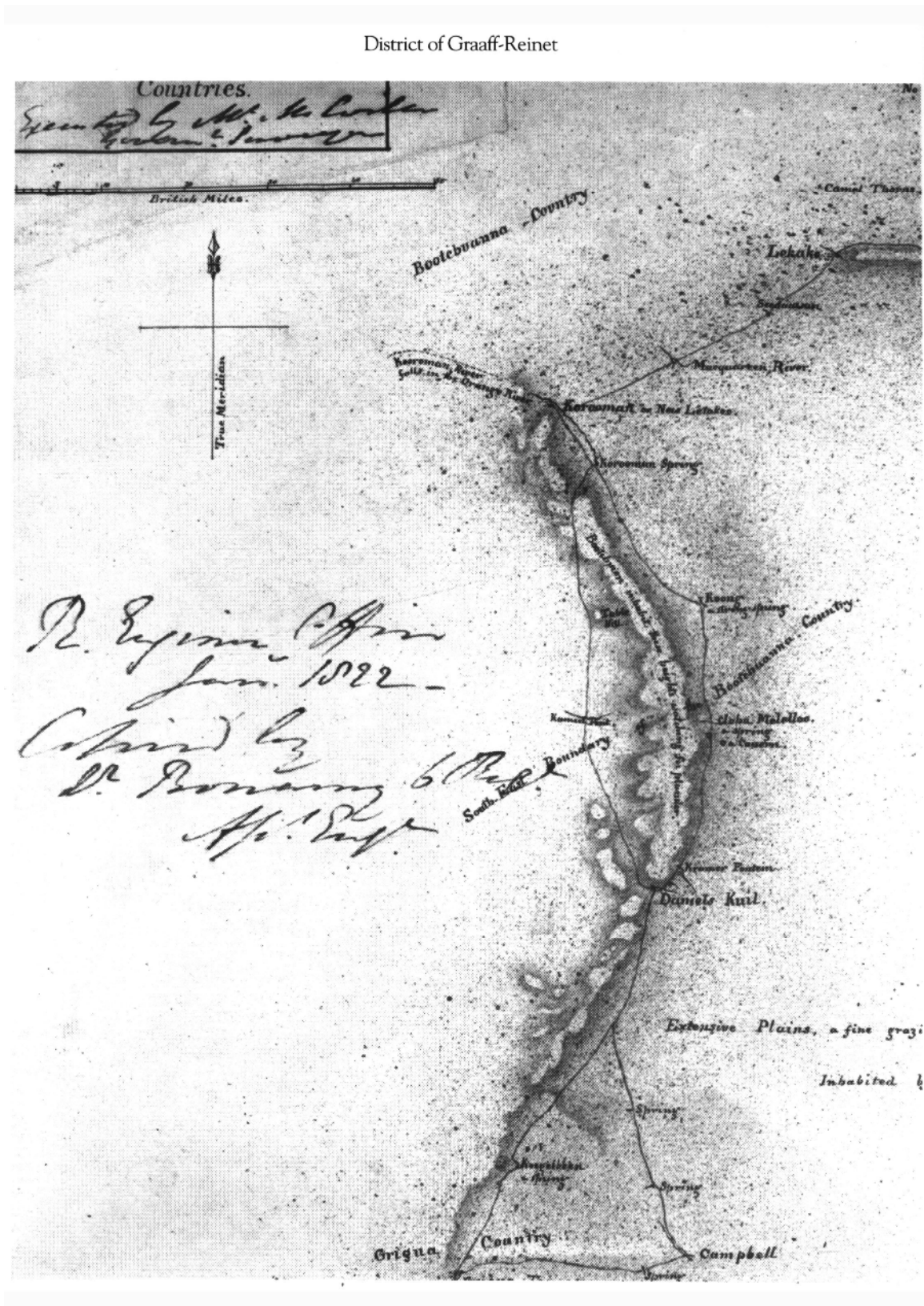
Figure 38: 1823 District of Somerset, Photographed by author from the original Royal Engineers Collection of Maps at William Cullen Library, University of the Witwatersrand, Map 3 Sketch showing the north-eastern frontier of the Cape of Good Hope signed by J.Bonamy

Figure 39: Signal Towers, Eastern Frontier. Photographed by author from the original Royal Engineer's collection William Cullen Library, University of the Witwater srand
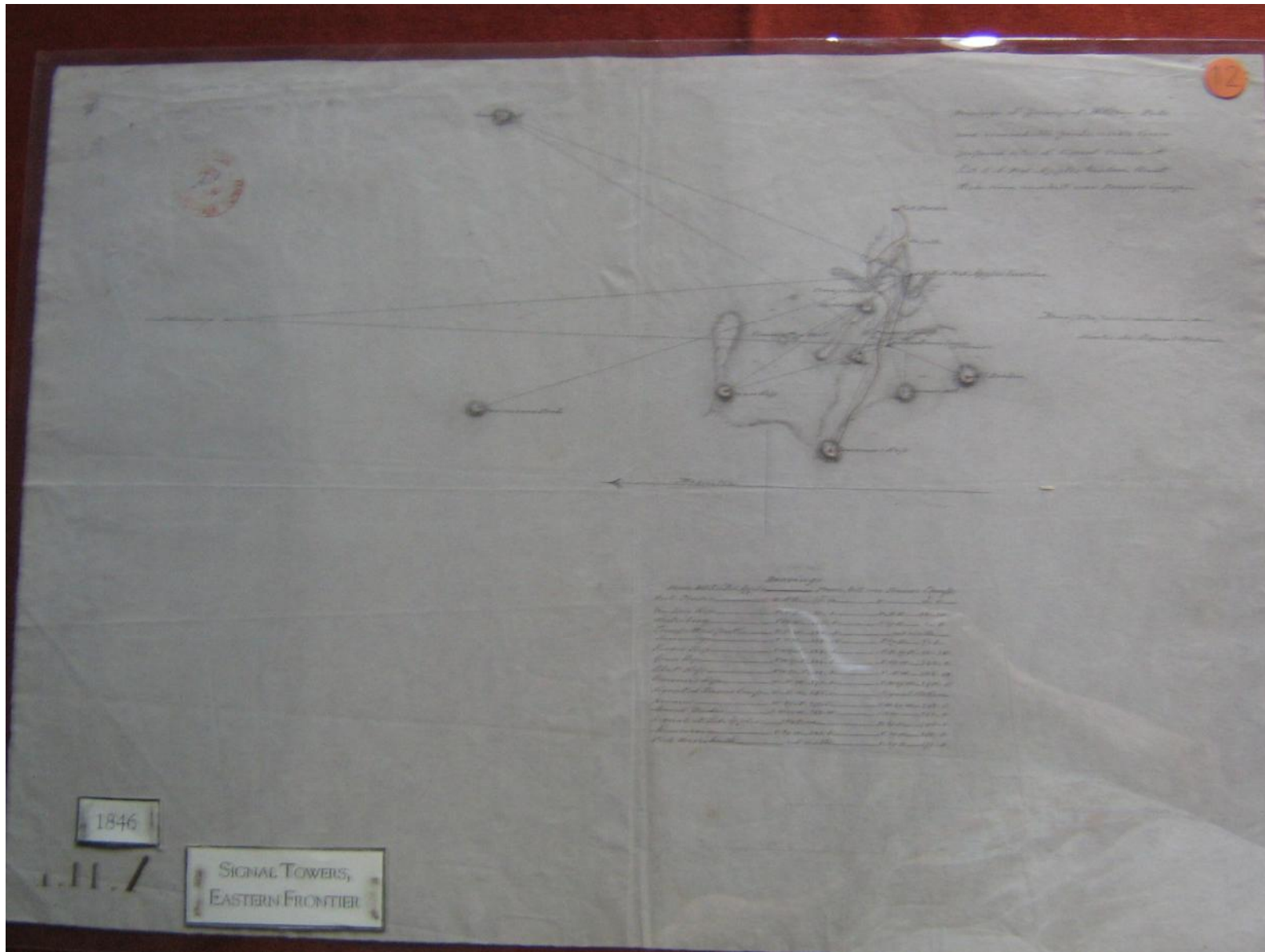
Figure 40: Detail of the previous map as depicted in Garson(1992:33)
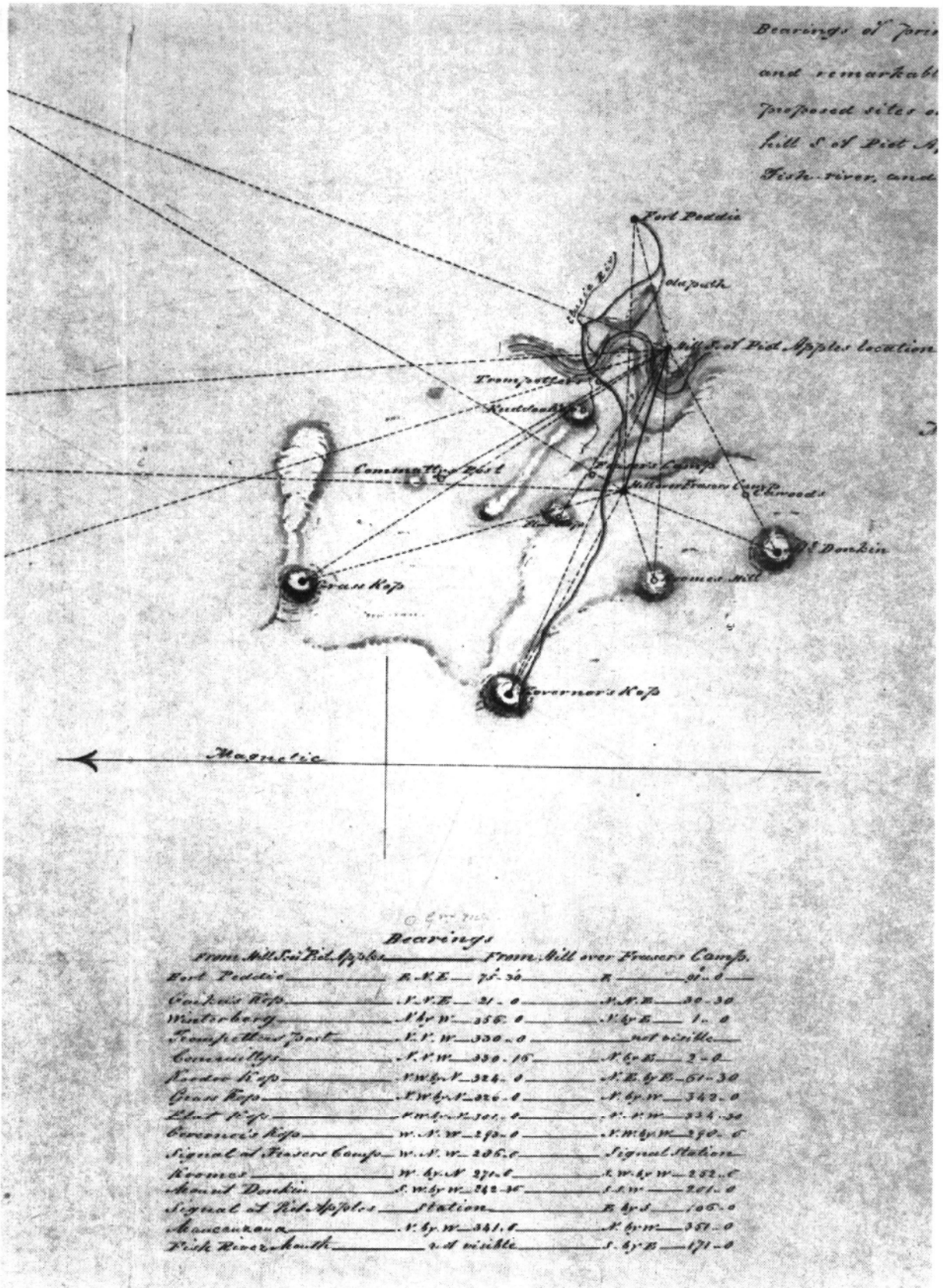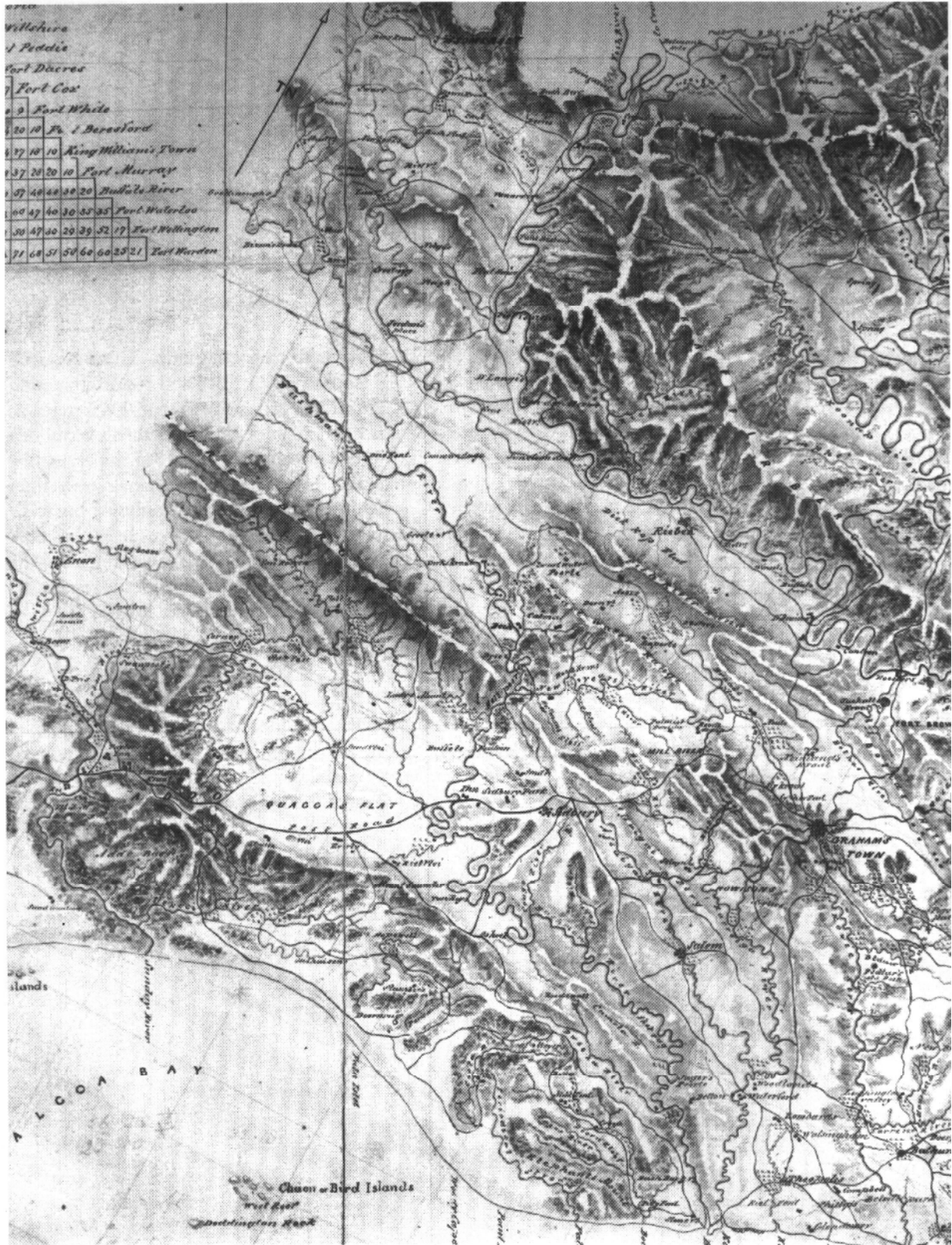

Signal Towers

Figure 41: Eastern Frontier Cape of Good Hope and adjacent country of the Kaffir (sic) tribes. Signed by J.Ried December 1846 Photographed by author from the original Royal Engineer's Collection William Cullen Library, University of the Witwatersrand.

Figure 42: Detail of Previous Map as depicted in Garson(1992:37)

Eastern Frontier

6.4 LAND TENURE

Perhaps the most lasting legacy of colonial control in South Africa is evident in the land registration system. Prior to colonial settlement, land in South Africa was valued for its grazing potential and tribes fought for the use of various regions and often migrated with their cattle throughout the year. Individual ownership was unheard of. Colonialism saw the introduction of a market economy; a central element of which is the ownership and control of land – a fundamentally different concept to the pre-colonial tribal system. Colonialism also eventually lead to closed settlement, where open land was no longer available – hence conflict arose.

Colonial South Africa has been influenced by two systems of land tenure, the first, introduced by the Dutch, was a very informal system and the latter the more formal British imperial system. The two had varying effects upon settlement, and were applied to different areas for very different periods of time. The British imperial system affected Natal for most of the second half of the nineteenth century and the Cape of Good Hope for only a short period. In the remainder of South Africa the Cape Dutch system, sometimes modified by ideas from the United States, was dominant. Figure 43 is an example of an early Dutch Title Deed.
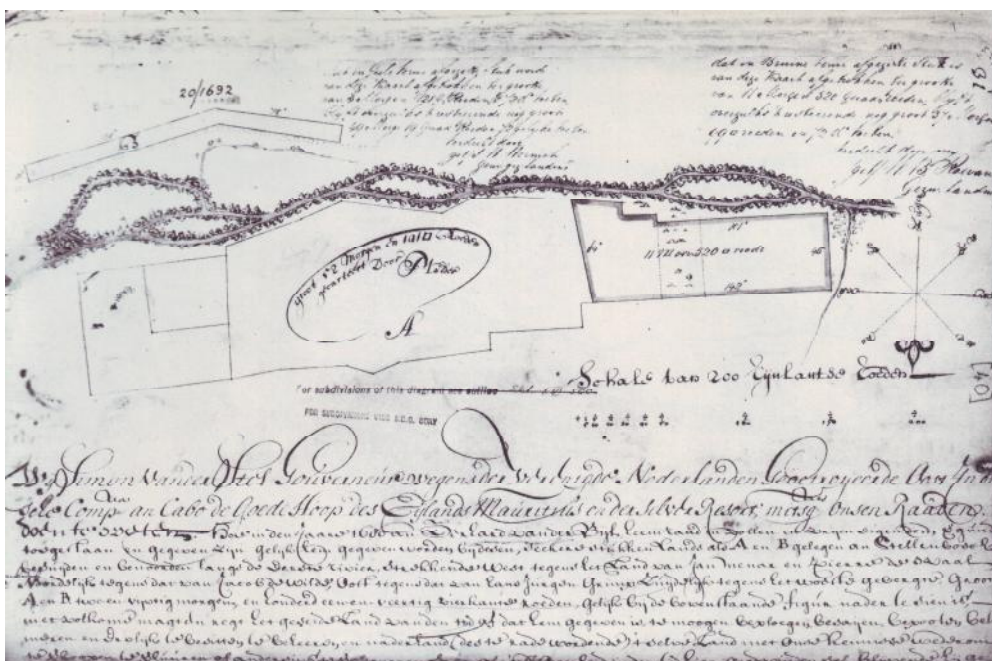

Figure 43: Example of Early Title Deed, in this case for the farm Vredenburg, which borders on Stellenbosch. The farm was granted in 1680 and registered on February 29th 1692. (Deeds Office Cape Town)

A very cursory and brief description of land tenure in South Africa follows; it is not intended to be exhaustive but merely a backdrop against which the Royal Engineer's contribution can be assessed[1].

The first land survey at the Cape was carried out by Peter Potter in 1652, when he surveyed a piece of land for released Dutch East India Company servant Jacob Cloeten (the land was registered by J.G van Grevenbroek) Potter's cadastral survey was topographical in nature, it therefore relied on distinguishing features as reference points. The area was lacking in striking features, thus, apart from the Liesbeeck River, which formed a suitable natural boundary, two posts were erected to demarcate the other boundaries. The positions of these beacons and boundaries thus demarcated were surveyed and delineated on a diagram forming part of the document of title; the deed of title also contained information on the ownership rights (full property), location and extent of the site (twenty morgen) (Simpson and Sweeny,1973:107; Cardy, 1990).

The survey system was inadequate as it became impossible to relocate the original corner beacons with any degree of certainty. Thus van Riebeeck in 1662 advised his successor: "…in order to prevent disputes among the freemen it would perhaps be advisable to force them to surround their lands by walls and dry ditches, because they shift their beacons at every moment, frequently causing trouble thereby" (Simpson and Sweeny,1973:108; Cardy, 1990).

The size of land grants however, increased rapidly when the settlers moved into areas remote from Cape Town. Cattle farms in particular needed extensive areas. The settlers evolved their own system of appropriating farms, which was recognized by the Company in 1732. There were either few or no surveyors in the Cape at the time; farms however, had to be demarcated in a land which had few natural reference points. It became established custom that a man could possess all the land within half an hours horseback ride at walking pace, from his house or the centre of the farm (giving an area of

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[1] For greater understanding of the topic please consult the two volumes of Collected Papers on the History of Surveying and Land Tenure published in 1884 (Vol 1) and 2004 (Vol 2) by the Institute of Professional Land Surveyors of the Western Cape; "British Land Policy at the Cape 1795-1844" by Lc Duly; the Masters' dissertation of E C Liebenberg entitled "Die Topografiese Kartering van Suid-Afrika, 1819-1972 (Unisa, 1973)"; the work on land policy and tenure by Prof Rodney Davenport, as well as the various articles on maps, mapping, and land registration by Vernon Forbes, Nigel Penn, Jane Carruthers, Lindsay Braun and Elri Liebenberg which have been published in historical journals.

approximately 3000 -3500 Morgan) (refer to Figure 44). Thus farms could be spaced an hours ride from each other (Christopher,1971:3; Cardy, 1990).
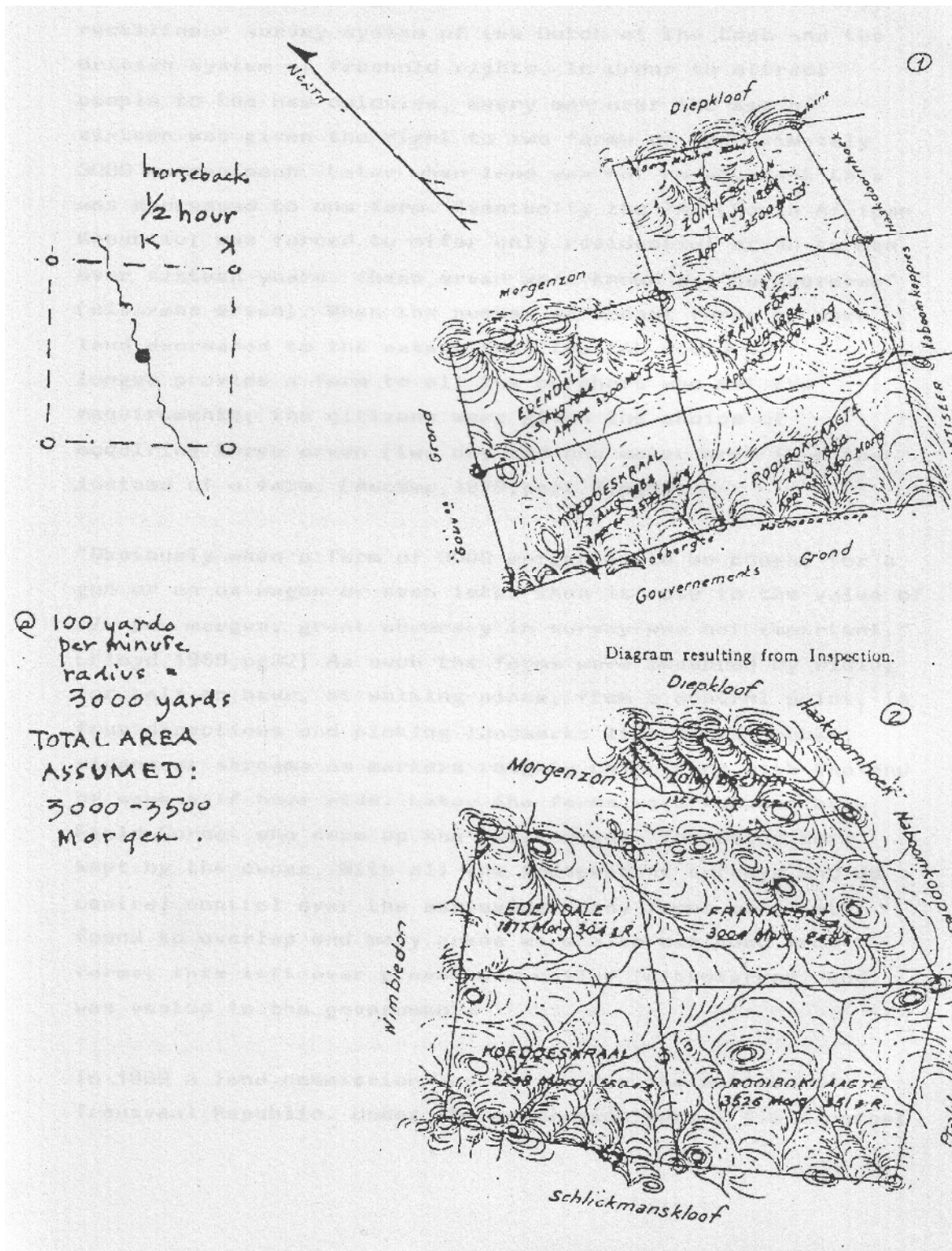

Figure 44: Surveying of Farm boundaries in South Africa; 1 shows the presumed boundary and 2 shows the boundary after accurate survey (from Professor W Mallow's private papers - Department of Town and Regional Planning University of the Witwatersrand)

The farmer would choose a landmark often a tree or ant hill, or place a small stone cairn at the corner; later a Field Cornet[2] would check the farm and draw up the title deeds, which would be kept by the owner. As there was no accurate systematic survey at the time there was no way of relating individual surveys, many farms were later found to overlap or were not contiguous with each other; but obviously when land was plentiful on the frontier and could be bought for a gun or an ox-wagon accuracy in survey was not important (Cardy,1990).

As far as land tenure was concerned the Dutch East India Company (VOC) allocated farms on an annual rental basis. In 1657 van Riebeeck allocated land to nine former company servants who formed two groups of "*free burghers*" (free citizens). Under the initial conditions of settlement the *free burghers* were to receive in freehold as much land as they could cultivate in three years (Guelke,1984:9).

When the British took over the Cape they started to change the land policy. The British began to formulate and implement a land policy in all of its colonies during the nineteenth century. In the last sixty years of the nineteenth century there was considerable demand for settlers in various "New Lands" of the world. To a large extent the governments of the countries and colonies involved competed with one another for suitable colonists. Assisted passage was offered, and rural land policies were formulated which, it was hoped would attract settlers. Agencies in the major European centres were established to publicise the attractions of the colony or state concerned, and a flood of propaganda was issued. (Figures 45 - 47).

Figure 45: Advertisement for Land in America (Ward:1998:16)

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[2] Field Cornet: A civilian acting as a military officer. Term used in South Africa, a civilian invested with the authority of a military officer and empowered to act as a magistrate. It was later a rank in the Boer commandos, and subsequently in the former South African army. (Encarta Dictonary)

Figure 46: Advertisement for the settlement of South Dakota (Ward:1998:19)
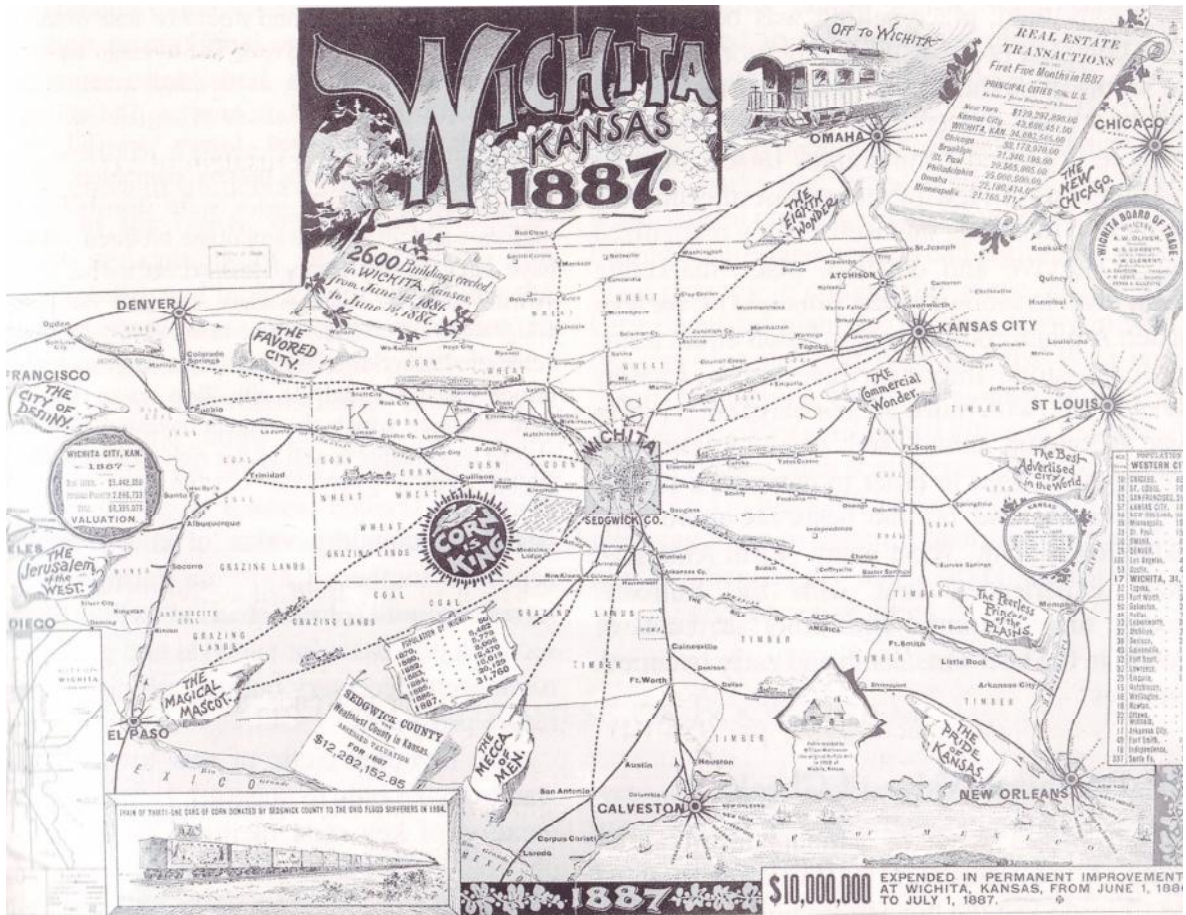

Figure 47: Promotional Map of Wichita produced by the local board of trade (Ward:1998:23)

The Victorian Era saw a great drive to extend European settlement and make use of land which was 'lying idle'. Settlement promotion was undertaken with the utmost optimism that a better way of life lay ahead for the colonist and that the opening up of the "New Worlds" would make the existing one a better place to live in (Christopher,1971).

There was no fixed agreement of how this would be achieved, however land was seen as the key, it was viewed in one of two ways: The first regarded land as being of intrinsic value and therefore a price could be placed upon any parcel of land; land in fact was a reserve of revenue which could be called upon by the state to meet other expenditure; often that of financing immigration. The second regarded land as only of value once improvements had been effected, and therefore land could be given to a settler on the understanding that it be improved and therefore the total capital value of the rural areas of the country in question would be increased. British settlements (or former British settlements) like the United States, Canada, Australia, New Zealand and to a lesser extent South Africa were all in competition for settlers and there was, thus, a keen interest in the developments of other states and frequent adjustments to land policy. The United States in particular provided a model for land regulations because of the success of the settlement of North America.

The British imperial system of land settlement owed much to the operation of the Congressional system of land division and sale. The United States of America formulated its land policy in the period immediately after the American War of Independence. In 1785 Congress adopted a Land Ordinance which was to apply to the federal public domain. The Ordinance provided for the survey of the land and its disposal by public auction at a minimum price of $1 per acre. The system was improved by the passage of the Land Act of 1796, which became the model for much legislation in other parts of the world. The system envisioned a close settlement of the public domain by an agricultural community, on lots of 80 – 160 acres in extent (South African farms as previously stated tended to be 3 000 – 3 500 morgen which translates to approximately 1850 – 2 160 acres). The lots were systematically arranged into sections and townships. The system of regular survey and auction was extended westwards from Ohio as the lands were opened up. Undoubtedly the scheme attracted many settlers who were able to buy land at reasonable rates. The government looked upon the disposal of land at first as a means of raising revenue, and the minimum price varied according to the economic conditions. However,

attitudes changed as the volume of immigrants increased in the 1830's when they felt that settlers could be placed on the Western boundary to make the United States internally strong – that is the settlers were used as a buffer – so alternate plots were sold. The system had a number of inherent problems firstly there was a lack of provision for pastoral farming, all land was supposed to be farmed with crops, secondly there was no recognition of different environments and as the development spread westward increasingly arid land was encountered – this however, only happened in the 1870 – 1880's so the policy was adapted to South Africa before this problem became evident (Christopher,1971).

British land policy was first formulated in 1832 and it copied many features of the American system, but in order to attract colonists away from America to other British colonies it needed to be more favourable. The colonial reformers attempted to mould the American system to British needs and introduce a system common to the entire British Empire, but it seems doubtful whether prospective conditions outside America were seriously considered. The basic thinking behind the policy was the desire to establish across the globe a series of colonies socially similar to England. The best features of the English rural community were to be transplanted to new environments and the evils associated with industrialisation were to be left behind. In so doing, it was hoped that there would be an increase in health and prosperity, not only for the new communities, but also for England, where contemporaries were faced with what appeared to be over-population. The whole policy of emigration was seen to be bound up with the price of land in the colonies. The colonial reformers felt that to develop a successful colony, there must be a balance between the supply of land, labour and capital. Land had to be used to attract settlers and the price had to be low enough to allow settlers to buy land they could afford and leave some capital for investing in buildings, machinery and animals. Critically however the land price had to be high enough to prevent labourers from buying land; it was necessary to maintain a labour force to work the land. It was also important however that land should not be totally unattainable to labourers who wished to work up to proprietor status (Christopher,1971).

The new policies of 1832 were a departure from the previous approach to colonial land where land had been granted at a moderate rental to anyone who would occupy it. The hope was some cultivation or pasturing of animals. The old approach was felt to be wasteful and the new fixed price or minimum upset price was introduced throughout the

Empire, nowhere was its introduction more troubled than in South Africa. When the policy was imposed on the Cape Colony it led to stagnation. The land the government held in the Cape was rocky "left over" land and there was little demand for it when settlers could simply move beyond the colonial borders and claim land. A sizable body of Cape farmers left the Cape colony, the *trekkers* (migrants) took their own ideas of land policy with them and so the Orange Free State and the Transvaal never adopted the imperial system. It was only in Natal that any direct clash of ideas occurred. The area had been settled by the *Voortrekkers* first and they were allowed to retain title upon British annexation, so three million acres out of ten million acres were already allocated, this area constituted the best agricultural land, however, it remained largely undeveloped due to its sale to speculators. Secondly the reports sent to Britain suggested greater soil fertility and rainfall than actually existed, the picture was of a lush tropical and sub-tropical region and prices were fixed in London accordingly. On the basis of considerable propaganda the Government of Natal was able to encourage settlers through a series of immigration schemes. The Byrne scheme was the most famous.[3] The Natal Government attempted many more schemes yet the policy led to the stagnation of the area and in 1857 the Government once again resorted to the granting of farms in return for a moderate rental, it proved popular but London intervened and forced the Natal government back to the Imperial policy, and once again stagnation of the rural areas occurred (Christopher,1971).

By 1860 the British imperial land policy in South Africa was seen to be unsuccessful. The Cape Colony abandoned it in 1860, while the Orange Free State and the Transvaal had never adopted it, it was only in Natal that it lingered. By the 1860's there was little in the way of imperial land policy left internationally as Australia and North America began to

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[3] The term 'Byrne Settler' is any emigrant brought to Natal by the company, J. C. Byrne & Co. These people landed in Natal on 20 ships during the years 1849 to 1851. Allotments were laid out in the Byrne Valley, near Richmond.

J. C. Byrne & Co. offered prospective emigrants a passage to Natal and 20 acres of land. Byrne's miscalculations eventually scuttled his scheme. He would have been saved these had he actually visited the Colony. First, he thought there were vast open spaces just waiting to be settled, as a result of the Boers' withdrawal from Natal once British rule had been established. However, he was out of date. In 1848 Sir Harry Smith, the Cape Governor (Natal was then a district of the Cape), made an attempt to halt the exodus of Boers by relaxing the regulations under which lands were granted. Thus the Government had very little left in the way of Crown lands in sufficiently large blocks to allow the settlement of large numbers of emigrants. Then his 20-acre lot plan was quite unrealistic, taking into account the Natal countryside – where was no way an immigrant could make a living here on 20 acres.

Thus Moreland his appointed surveyor, found it extremely difficult to obtain suitable land, i.e. well-watered, with good soil, access to timber for firewood and building purposes, and within easy distance of either Pietermaritzburg or Durban. Many emigrants rejected their allotments as not worth the payment of survey fees, and either found jobs in the towns, or purchased or leased land at very little cost elsewhere. They were certainly not going to buy Byrne's land at 5/- an acre.

Things went from bad to worse, and eventually in Sep. 1850 Byrne surrendered his estate.

administer their own policies and there was general liberalisation of land policy the most famous of which was the American Homestead Act of 1861.[4]

The Crown Lands Act of the Cape Colony in 1860 allowed for a return to rents on land and importantly did not limit the size of farms, this allowed a move away from cultivated farms to grazing and vast sheep farming districts emerged. Close settlement was no longer the aim of the Cape legislators - they sought men with capital and were no longer interested in close European settlement or the importation of either European farm labourers or industrial workers. The new system allowed for land to be sold at public auction and taxed thereafter by means of a perpetual rent. Taxes and rent were low as both were calculated on the land value for pastoral farming. The areas were large and varied which made the system highly flexible. The Surveyor General's Office was able to adjust rents, minimum prices and extent according to the capabilities of the land, a system which was only possible when the volume of work at the Surveyor General's Office was small (Christopher,1971:6). The basis of the policy at the Cape was that there was an inexhaustible supply of land, which for the Cape was true until the end of the century, however, the same policy in the Orange Free State and Transvaal led to a build up of pressure on available land, and sons found that there was no longer land to claim and that subdivision was not practical. At several stages in South African history during the nineteenth century military conquests established new zones of settlement to relieve pressure on the old established areas. In each case, use was made of tribal warfare among the African populations to introduce a small army of Europeans, who having defeated one of the contenders in the tribal war exacted their price in land from the victor (Christopher,1971).

Land policy and the alienation of land was seen as vital to colonial settlement and colonial settlement was seen as vital as it established new producers of raw materials, new markets for European goods and a way of decanting the growing population of Europe. Land was allocated as a way of attracting settlers, it was perceived as having an intrinsic

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[4] **The Homestead Act** was a United States Federal law that gave freehold title to 160 acres (one quarter section or about 65 hectares) of undeveloped land outside of the original 13 colonies. The new law required three steps: file an application, improve the land, and file for deed of title. Anyone, including freed slaves, who had never taken up arms against the U. S. Government could file an application and improvements to a local land office. The Act was signed into law by President Abraham Lincoln in May 20, 1862. Eventually 1.6 million homesteads were granted and 270 million acres (1.1 million km^2) were privatised between 1862 and 1986, a total of 10% of all lands in the United States.

market value. The Imperial policy was overwhelmingly a rural land policy, firstly as a reaction to the problems of industrial towns in Europe but also because the colonies were seen as the producers of raw materials, industrial goods were produced almost exclusively in Europe and shipped back for sale to the colonial markets. Towns at this time in the colonies were for administrative purposes and as markets for the rural commodities.

The frontier only truly closed after the Anglo Boer War when a large number of poor whites flooded to the urban areas. Increases in urban populations combined with the developing mining industry led to the industrial development of South Africa and a move away from an agricultural subsistence frontier.

6.5   THE ROYAL ENGINEER'S CONTRIBUTION TO LAND SURVEY, TENURE AND MAPPING

It has been shown that the Royal Engineers were a critical component in the systematic mapping of South Africa, they began with coastal surveys and route maps and extended to producing regional surveys and maps of frontier terrain and fortifications. Many present day towns owe their origin to Eastern Frontier forts e.g. King Williams Town. The maps were drawn in the scientific tradition with detailed scales and measurements.

Military mapping formed the basis of much of the demand for accurate mapping as was evidenced by the mapping of the Eastern Frontier and the demand for accurate surveys during the Anglo Boer War. There are classic accounts of what happened when mapping was not accurate such as occurred in the Zulu wars in Northern Natal, where the British suffered a number of major losses largely through lack of preparation and poor knowledge of the terrain.

After British occupation of the Cape, the first Engineers were used to produce accurate coastal charts. This clearly illustrates the strategic reason for the colony. Effort and expertise were focused on the sea route to India and its defence. The next major mapping was of an exploratory nature mapping routes inland. The exploratory maps depict soil types, vegetation, peoples and game, they are exploring the land with a view to its commercial value. Sources of raw materials are noted and good grazing delineated.

The wars on the Eastern Cape frontier required terrain mapping for military purposes. These maps and plans were most often produced to illustrate reports to London and to site military buildings such as forts and signal towers. Maps and plans formed part of the reporting system of the Colonial government, they were not produced for the colonialists, as is evidenced by the fact that very few Royal Engineer maps were reproduced or printed.

The Royal Engineers seldom became involved in the land surveying for registration of ownership other than in towns. When farm land was so plentiful and surveyors scarce, they were primarily used to lay out towns and infrastructure; farm survey was left on a more *laisse-faire* basis until increasing demand and pressure on land required more accuracy. This is quite different from the America, Canada and Australia where surveying of property rights was more comprehensive, the impact of the *laisse-faire* approach is evident in the cadastral plans, if you view property boundaries in Canada, America, Australia and South Africa you can clearly see that although all of the policies aimed at square farms the South African cadastral landscape is far more random. Much of America was surveyed as the railways expanded westward. This difference in approach was due to the fact that South Africa was never viewed by the British as a permanent European production/agricultural settlement. The British only really wanted South Africa so that other colonial powers would be prevented from controlling the sea route to India. Later in the 'Scramble for Africa' it was more about asserting British domination than a desire to create new production colonies. America, Canada, New Zealand and Australia were all created as permanent European agricultural settlements from the outset. The agricultural land was thus critical and more systematic surveys were done from the outset. (Refer to figures 48 - 50.)

The influence of land surveyors in South Africa follows the colonial trend at the time; as new lands were acquired, a first priority was to survey them. The mapped cadastral survey was one of the most powerful instruments available in the colonies for allocating the prime resource – land. In the long-settled lands of Europe, the land surveyor's work was largely confined to demarcating and mapping, but in the colonies he was doing much more. He was the instrument for imposing a whole new economic and spatial order on the territory. The land surveyor was an explorer, resource appraiser, town planner, delineator of route-ways and the shaper of landscapes both urban and rural. Until he had traversed the land with chain and compass, and the results recorded on a map, it could not be fully converted

into private property; however, in South Africa, as was shown above, the mapping was subsequent to settlement and land ownership was established prior to detailed and comprehensive mapping of South Africa.

Home (1997) points out that it was the land surveyor who subdivided colonial towns into their ample lots; and this established the character of the low-density suburban landscapes characteristic of the colonies. These low density suburbs in turn influenced the 'Garden Suburb' movement in Britain.

To this day South Africa operates on the basis of surveyed private properties. Many towns and cities in South Africa are characterised by the low density suburban plots and stand alone houses of the colonial era; indeed in many respects these are lifestyle choices still aspired to by many, especially those denied these standards by the Apartheid era. In the following chapters the focus will be on the establishment of towns, infrastructure and technological advances made by the Royal Engineers.

Figure 48: Example of regular Survey America (Rand Mc Nally Road Atlas, 1990)

NEBRASKA U.S.A.

1 : 1500

The roads, which run along property boundaries, clearly show the grid layout.(Rand Mc Nally Road Atlas 1990)
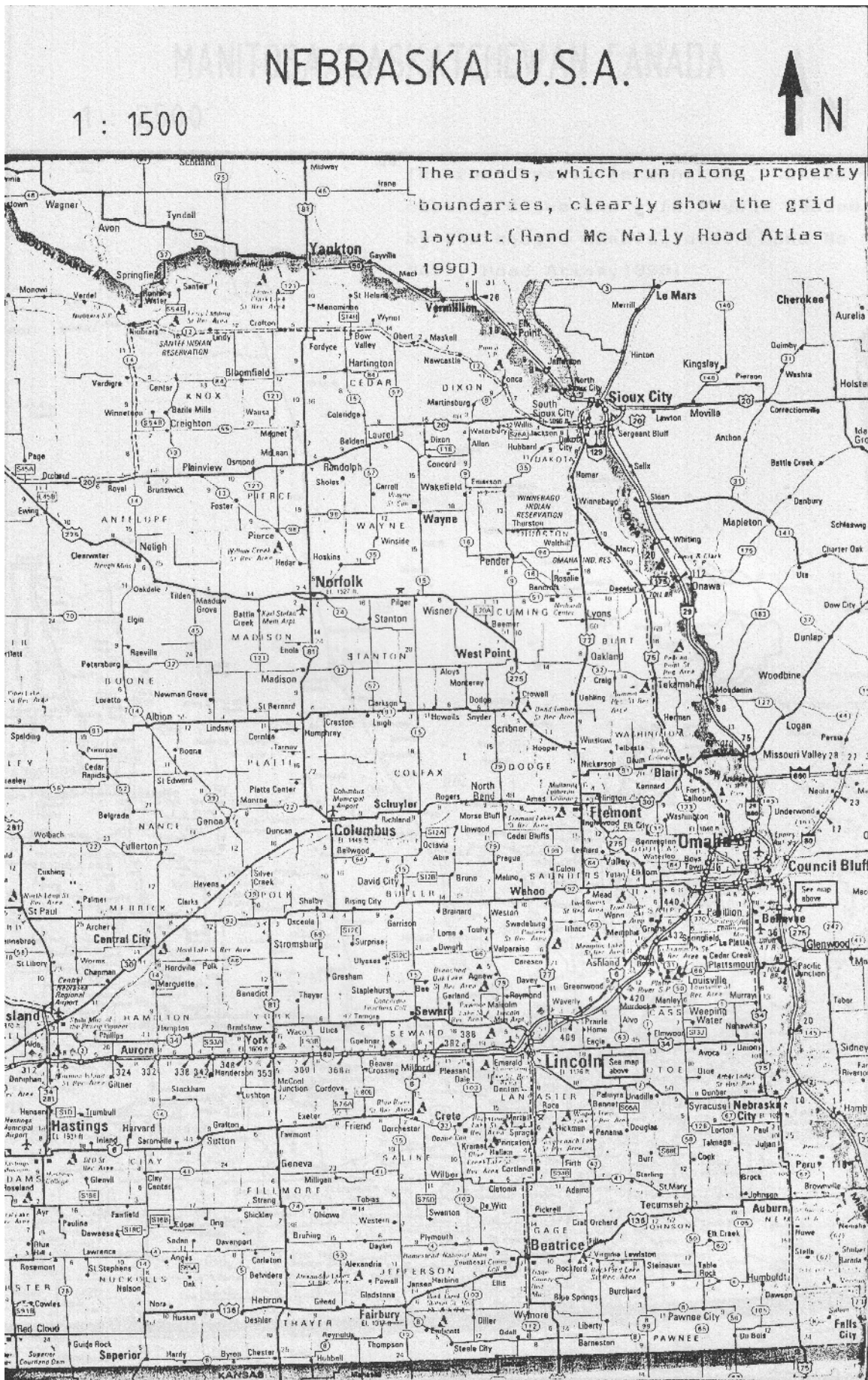
Figure 49: Example of Regular Farm Survey Canada (Rand Mc Nally Road Atlas, 1990)

Figure 50: Irregular Farm Surveys South Africa (Topo-cadastral Map Series, Government Printers Pretoria, 1990)