

CARTOGRAPHIC RECORDS IN ARCHIVES: A SHARED RESOURCE

By

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ABSTRACT

Cartography is often viewed as such an esoteric discipline employing art and science in the creation of records that little is known outside cartographic agencies about the evolution of the maps. Archives concerned with acquiring cartographic records have tended to concentrate on collecting the published maps. Maps are most often consulted for their illustrative value or reference quality. However, this illustrative value often obscures the character and evidential value of maps. This thesis attempts to show that cartographic materials have important evidential value and that archives have a responsibility to help ensure this value is recognized both in the acquisition of records and in their eventual use.

The first problem for archives is to identify the full range of the cartographic record both in terms of agencies which produce cartographica and the records generated within each agency. Therefore, this study examines the range of cartographic records which have been produced in British Columbia over time, and the types of cartographic records three British Columbia repositories acquire. The second problem is that archivists need to gain an awareness of the cartographic communication process itself. To this end, this study outlines some aspects of cartographic communication which bear on matters of archival administration. Each of these in turn affects the appraisal of the evidential values of cartographic records. These indications of the complexity, together with the increasing sophistication, of the

cartographic records argue strongly for the archivist's knowledgeability about their production as an aid in their use or interpretation.

Cartographic materials have a valid place in archives but the archivist must take an active part in acquiring and understanding the records documenting the intervening procedures between data collection and map publication. Maps can serve a wider public and archives can be an important milieu for the more comprehensive use of the medium by acquiring the full range of cartographic records as well as helping researchers towards a better understanding of the motivating ideas behind the records they are using.

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INTRODUCTION

It is interesting to speculate on how different our understanding of history might be today without the comprehensive collections of archives available to us. The confident sense of continuity with the past which we cherish would be lost without the archival repositories which preserve records for us until we discover a use for them. As museums hold artifactual evidence of human productivity so archives hold documentary evidence which gives us the sense of "being there" at the time events in the past took place. Archives provide the dimension of context to history which enables events, people and places to be more truthfully understood. The history of Canada's surveying and mapping, the story of the country's exploration and settlement by Europeans, can be found in archives across the country. Cartographic archives provide the lens through which we can not only see the earth as it has been perceived through a relatively short period of time but through which we can look at both early and contemporary attempts to present our attitudes, beliefs and knowledge about the land and our place on it. Cartographic archives contain the means to show us how Canada appeared to earlier generations and what was important to them. The records comprise the accumulated evidence of man's territoriality. In order to understand what cartographic records are trying to show us, certain facets of their special nature have to be considered.

Cartographic records are an amalgam of scientific, artistic and communicative skills, and this compound nature must be represented within

the cartographic holdings of archives if the maps are to be fully utilized. Careful selection of material can not only document the important stages of development of man's impact on the land but show the technical evolution of cartographic documentation as well. The individual maps which are held in a single archives may indicate cartographic diversity but if they are considered together in context with the holdings of other map repositories much more can be understood about the map production of a region. Therefore, it is important that the archives be part of a network which seeks to preserve, and which may in fact become, the total cartographic memory of an area. This network of cartography stems from the nature of the medium itself. Instead of being the result of a progressive accumulation of data ending in a finished product, as, for instance, in a book on a certain topic, base maps may be added to and modified to create new and different products, often by quite different creating agencies. The same base map and basic information about an area may be transformed by adding specialized information to it. For this reason retention of cartographic records in various repositories, record offices as well as archives, allows for the most intelligent, most complete utilization of this complex medium. Each office within this network can provide the needed context by assembling the additional records and expert staff to assist the potential user to understand what it is the records are trying to communicate.

This thesis will examine the nature of cartographic records, in historical as well as contemporary forms; the role of archival repositories in networks of offices preserving cartographic records;

their role in the interpretation of cartographic information; and the selection of cartographic records by archives. The study will focus on cartographic records produced by federal, provincial, and municipal government agencies as they relate to British Columbia. To begin, a brief review of map production in British Columbia will illustrate how the field of map creation in the province has grown and diversified to the present day. The major centres of map making in the province are clustered on Vancouver Island and the lower mainland and consequently the choice of archival repositories considered in Chapter Two reflects this concentration. Under examination are the holdings of the Vancouver City Archives, The University of British Columbia Library, and the Provincial Archives of British Columbia. Chapter Three looks at some factors influencing the cartographic communication process and how networks of repositories preserving cartographic records would benefit the transmission of cartographic communication. The concluding chapter considers how the archival appraisal process is affected by the diversity and increasing sophistication of the cartographic record.

CHAPTER I

Cartographic Records Production in British Columbia

Modern British Columbia mapping has evolved from beginnings which can be traced to a wide variety of enterprises. The seeds can be found in the journals and maps of Europeans in the late fifteenth and early sixteenth centuries when French, Spanish, English and Russian adventurers sought to expand the extent and wealth of their homelands. During early expeditions North America merely stood in the way of Europeans with aspirations to reach the riches of Asia. But in time the region itself came to be valued as commercial interest in its natural resources led to both a maritime and a continental fur trade. Commercial exploration and the settlement which followed it laid part of the foundation for the future province's cartographic heritage.

First, it is necessary to place modern British Columbia mapping in an historical context. By briefly tracing the exploration of the region by land and by sea, it may be seen how the area first came to be mapped and how the constituents of its cartography, its agencies and their technology, changed over time. It is also useful to outline the historical development of certain types of maps in Canada as a whole in order to sketch the larger framework within which British Columbia cartography evolved. Secondly, we will examine the development of the map making traditions in British Columbia itself, those based in national programmes as well as those indigenous to British Columbia. This encapsulated description of how contemporary mapping has evolved from the amalgam of the goals and

experiences of explorers, settlements, military companies, and fledgling governments is necessary in order to understand the variety of records which comprise cartographic holdings in British Columbia archives today.

The emphasis here is primarily on revealing the administrative history of British Columbia cartography, which is important information to the cartographic archivist who faces the task of appraisal and selection of records from this vast field. Identification of the variety of agencies which have produced maps as well as of the purposes for which such maps have been created helps ensure that the range of cartographic records within an archives will contain, as far as possible, those records which best reveal the evolving history of the cartography of the region. Informed selection of the cartographic record also reveals the evolving landscape as it has been interpreted by several generations of map makers.

The mapping of British Columbia is but one facet of the long history of Canadian cartography. In Canada, as elsewhere throughout the world, exploration and commerce have motivated men to fill in the blanks in geographical knowledge. The cartography of western Canada began with the first map of the prairie region drawn by Pierre de la Vérendrye in 1728.¹ Commercial enterprises of the Hudson's Bay Company and its rival, the North West Company, brought their cartographers, Peter Fidler and David Thompson² to the westerly regions of Rupert's Land in the late 1700's and early 1800's. Scarcity of furs in the prairie region soon pushed exploration further westward as David Thompson explored and mapped

the Columbia and Kootenay Rivers in 1807 in the course of the search for new trading possibilities and good transportation routes. This incentive to reach further towards the Pacific resulted in the piece by piece creation of a detailed record by those traversing the land. These general maps not only documented the terrain but facilitated the explorer's return to an area once travelled and illustrated the geographic features for his sponsors in Europe. Such maps enabled plans and decisions to be made pertaining to transportation routes and eventual claims to the land itself.³ The general maps from such journeys were the forerunners of the most basic map in use today, the topographic map. A topographic map is one which is intended "to portray and identify the features of the Earth's surface as faithfully as possible within the limitations imposed by scale."⁴

These early topographic surveys resulting from the competition between fur trade companies were compiled by explorers, traders, and cartographers possessing varying degrees of proficiency. But as exploration progressed surveyors were being trained in Britain and Europe in the latest surveying technology (including the use of Harrison's chronometer, perfected in England in 1765, which accurately determined longitude)⁵ in order to carry out topographic surveys of their respective countries as aids to government and defence. Consequently, by 1778 maps based on scientific instrumental surveys were being produced, the most notable in Canada being the work on the east coast by Joseph Des Barres and in the western interior by Philip Turnor.⁶ A new printing process called lithography would enable John Arrowsmith and other British map

makers to produce and distribute up-to-date editions of maps from information gathered as exploration of the northern and western regions of Canada continued through the 1800's.

Another step in the process of characterizing the land was taken when the need for scientifically accurate geological information, gathered in an organized and comprehensive manner, led to the formation of the Geological Survey of Canada in 1842. In compiling base maps to accompany the geological reports, the Geological Survey was the first Canadian author of topographic sheets. Many of these sheets also found use as general topographic maps in the absence of any other large-scale mapping.⁷ Another agency which soon became involved in large-scale mapping was the office which later became known as the Survey Division of the Department of Militia and Defence, now named the Mapping and Charting Establishment. Responding to the fear that British North America would need to be defended against the Union Army of the United States, this office was engaged from 1863 to 1871 in drawing up detailed topographic sheets at 1:2500 depicting fortifications along the Canada/United States border. These fortification surveys were kept secret by the Department and therefore were not available for general use.⁸ A third source of Canadian topographical mapping began in 1871 when the Dominion Land Survey began in the prairies under the direction of the surveyors of the federal Department of the Interior.⁹ Concerned about the vulnerability of the uninhabited land north of the 49th parallel and convinced that Canadian settlement would help secure the border, the Department's primary focus was the cadastral surveying of the Canadian prairie region in order

to encourage settlement there. Cadastral mapping, the mapping of property boundaries, helped clear the way for quick and systematic settlement on prairie lands. As the Department's responsibilities grew it also engaged in topographical surveys in the Rocky Mountains. The initial series of maps intended for purposes of land registration was subsequently joined by a second series, in smaller scale, created for purposes of federal land administration. Through the evolution of these agencies, it is possible to trace the natural growth of the National Topographic Series to the form we are familiar with today.

As formal topographic and cadastral mapping programmes were being organized east of the Rocky Mountains, the surveying and mapping of both the coastal and inland regions of British Columbia by local authorities began. Until the settling of Victoria in 1843 with the attendant demands for cadastral surveying, the bulk of mapping in the region was marine-based. Captain James Cook in 1778 and Captain George Vancouver in 1792 and 1793 continued the northern coastal explorations begun in 1774 by the Spanish. In 1795, British interests were furthered when the British Admiralty created the Hydrographic Office of the Admiralty to coordinate the information gathered in surveys including those carried out prior to settlement of the Pacific's northwest coastal region.¹⁰ The United States Coast Survey charted the Pacific Northwest coast as far north as the 49th parallel as early as 1841 with the same goal in mind. The survey ships of the Royal Navy, which had a significant presence during the negotiations over the location of the international boundary along the 49th parallel were recalled after the signing of the boundary

treaty in 1846. The Royal Navy did not return to the area until 1857 when its experience and precise surveying techniques were again required to help settle differences of opinion between Britain and the United States over the boundary as it fell between Vancouver Island and the San Juan Islands.

On shore meanwhile, increasing settlement created a need for land surveys. The Hudson's Bay Company's interests in establishing a British settlement provided the impetus for the first land surveys on Vancouver Island. Here, in contrast to surveys in eastern regions, the initial work was carried out by private rather than government initiative. Officers of the Hudson's Bay Company held the first surveying positions, although they were not always trained for such work. The first, A. Lee Lewes, was employed to "make a site plan of the Company's new establishment at the Southern end of Vancouver Island"¹¹ in 1842; the second, Captain W.C. Grant, served in 1849-50, but not until the appointment in 1851 of the third Company surveyor, Joseph Despard Pemberton, did anything of significance result. His appointment finally "marked the inception of cadastral surveys of consequence on the island."¹² The necessity for cadastral surveying increased as Victoria grew and Pemberton became the first Surveyor-General of the colonial government's Department of Lands and Works in 1859. Pemberton's surveying was intended to pave the way for settlement in order that the Hudson's Bay Company might fulfil its promise to bring in colonists and thereby retain its proprietary rights to Vancouver Island. He also surveyed the townsites beside Fort Victoria and nearby Esquimalt Harbour

in order to produce the plans the Company needed to promote land sales. In time, settlement was laid out not simply in the Company style of stockaded buildings but in lots in preparation for further population and commercial growth stemming from farms and businesses providing produce and European goods to the posts and whaling operations in the Pacific region. The Royal Navy resumed its surveys of the coastal harbours in 1857. On the mainland of British Columbia the first Surveyor-General (counterpart to Pemberton) named by Sir Edward Bulwer Lytton, Secretary of State for the colonies, was Colonel R.C. Moody, who commanded a special force of Royal Engineers despatched from England in the fall of 1858 and "directed to survey land suitable for settlement, mark out public reserves and road locations, and prepare a site for the seat of government on the mainland."¹³

The Royal Engineers were first sent to the area known to the Hudson's Bay Company as New Caledonia primarily due to Company fears about its hold on the region. It was a vast and valuable possession which the British were afraid of losing to the American settlers moving steadily west and north. In 1845 two of the select corps of well-educated and well-trained military officers were sent from Montreal on a confidential mission to observe the situation in the area and determine whether the British could be adequately protected in the event of war. This military role waxed and waned in importance but for the next fifty years the Royal Engineers were to be the source of important contributions to the development of the cartographic record in British Columbia. In addition to this initial expedition (the reports and maps

of which are housed in the Public Record Office, London, England),¹⁴ the Royal Engineers were involved in the Land Boundary Commission to produce the final survey of the 49th parallel to determine the boundary's exact route which in turn defined the Southern border of what was to become British Columbia. In 1858 a contingent of Royal Engineers was instructed to carry out townsite and road surveying and road-building. The maps and plans produced were printed on their own press in New Westminster and distributed locally and sent to Britain. Finally, between 1871 and 1906 the Engineers were engaged in a joint military survey of British Columbia with the Canadian government with the objective of selecting permanent fortification sites. Their sojourn at the military base at Esquimalt, just outside of Victoria, ended in 1906 when they were recalled to Britain. Their activities were carried on in Canada by the Royal Canadian Engineers. Their departure marked the end of British mapping in British Columbia.¹⁵ After 1906 most surveying was done by agencies of the provincial government.

Local government involvement in cadastral surveying can be dated from 1858 with the creation of the Lands and Works Department of the Colony of British Columbia under the direction of Colonel R.C. Moody of the Royal Engineers. The small contingent of Royal Engineers engaged in surveying was unable to produce surveys fast enough to keep up with the demand for land with the result that in 1860 the "pre-emption system based on filing for and occupying lands prior to survey and purchase"¹⁶ was begun. The 1860 Proclamation and its 1861 amendment provided "the first statutory recognition of survey regulations" and "empowered the

Chief Commissioner of Lands and Works to appoint 'sworn surveyors' and to issue a scale of remuneration which they would be paid."¹⁷ By 1871, when British Columbia joined the Dominion of Canada, mapping in the province had reached a new stage. The successor to Colonel Moody as Chief Commissioner of Lands and Works, J.W. Trutch, was responsible for a map dated 1871 which is credited today with being a benchmark of "the close of exploratory mapping and the full entry into the era of precise instrumental surveying and mapping"¹⁸ on the Northwest coast of Canada. The Provincial Department of Lands and Works was constituted in December 1871 and the office of Surveyor-General became part of this Department. The Chief Commissioner controlled government contract surveying and mapping in conjunction with the Surveyor-General who handled the daily administration of the programmes.¹⁹ The institution of its own surveying and mapping office after Confederation was evidence of recognition by the provincial government of its need for knowledge of the land in order to administer it. Its role as part of a growing nation, within federal unity rather than under colonial rule, signalled British Columbia's intensifying responsibility for documenting its own development. Cartographic production kept pace.

In 1873, the surveys being made by Provincial surveyors were joined, and in many cases overlapped, by the Dominion surveys of railway belt lands.²⁰ Both privately and provincially compiled information was drawn on for a map of the province which came to be viewed as the successor to the 1871 map produced under the direction of J.W. Trutch. In 1895, the Honourable C.B. Martin, Chief Commissioner of Lands and Works, unveiled

the new map, which has recently been called "a good example of the state of cartographic art in British Columbia in the late 19th Century."²¹ As British Columbia cartography evolved, incorporating new techniques for surveying, new provincial topographic and thematic map series developed and the production of these maps quickly became a complex government industry. As more and more information on the Province was gathered and as government departments diversified to carry out new programmes, the records grew more sophisticated as well as more numerous. New series documenting the provincial land management schemes were needed to reflect the intensity and spread of land settlement. British Columbia's mapping was evolving from the overall documentation of a province's growth to the in-depth representation of land use by means of a systematic progression of thematic and topographic series. The populating of the land called for a change from the earlier emphasis on small scale mapping of general areas of the mid-to-late 1800's to mapping in larger scale of specific lands by the early 1900's. By 1913 British Columbia was producing four distinct series of maps to cope with the complex land system. These series were named the Pre-emptor, Land, Degree, and Topographical.

The Pre-emptor Series "outlined surveyed lots and indicated lands open for pre-emption in a distinctive colour tint"; the Land Series was "confined to coastal areas, and similar to the Pre-emptor maps, usually contained notations of interest to settlers"; the Degree Series was "the forerunner of the National Topographic Series" and showed surveyed lots and important cultural details; the Topographic Series was the product of early contour mapping.²² These series formed the basis for record

keeping in mapping offices for many years. The longest surviving of these, the provincial series, was not completely supplanted by the National Topographic Series until the 1970's.²³ During the flourishing of these four series, the central mapping establishment in the Province was the Surveyor-General's Branch and its offshoot, the Geographic Division. Today, mapping is carried out by many government departments with the work often criss-crossing administrative jurisdictions.

In the main, three ministries are presently responsible for the bulk of British Columbia provincial mapping. The Ministry of Environment encompasses map production units such as the Terrestrial Studies Branch, the Surveys and Resource Mapping Branch, the Fish and Wildlife Branch, and the Marine Resources Branch; the Ministry of Energy, Mines and Petroleum Resources contains many important geological divisions; and the Ministry of Lands, Parks and Housing encompasses the Surveys and Land Records Branch, the Surveyor-General, and Legal Surveys. Cartographic and drafting units of the Terrestrial Studies Branch in both Victoria (headquarters) and Kelowna (satellite operation) carry out "mapping, graphics presentation, report graphics production and computer digital mapping . . . as well as projects undertaken by aquatic studies, air studies and the planning and assessment branch (and other groups within the Ministry of Environment)."²⁴ Inherent in the production of these various cartographic records is the generation of textual records documenting the methodology employed as well as the programmes whose purposes the maps serve.

Map production has consistently involved many distinct stages, including surveying, processing of data, reproduction, and distribution. Surveying and its related activities results in graphic records such as sketch maps, terrain sketches, field notes, and aerial photographs. The second phase, processing of data, results in base maps, master negatives, master overlays, blueline proofs, printing plates and press proofs. The extent of reproduction and distribution, the third phase, depends on demand, and, in many cases, the type and form of a map will be determined by cost factors and potential use. Generally speaking, the more formal the use the higher the quality and the more expensive the copy. For example, the Terrestrial Studies Section of the Surveys and Resource Mapping Branch, Ministry of Environment, contributes cartography to the Technical Report Series. This series, which is in addition to the products available to user agencies, is a working report series which responds to specific queries. A recent example is the series of reports in support of the mapping surveys done for the northeast coal project. In the words of the Head of Cartography for the Terrestrial Studies Section this project "exemplifies our 'state of the art' progress"²⁵ and uses automation combined with graphics to put out a quality product in limited time.

Chart production, an important segment of the cartographic output in British Columbia, also evolves through these various stages. Nautical charts describe the area below the shoreline whereas topographic sheets are concerned with the area above it. The Canadian Hydrographic Service (CHS) is a major component of the Ocean Science and Surveys Sector of the

Federal Department of Fisheries and Oceans. Of the four regional offices, the Pacific Region Office, located at Patricia Bay near Victoria, distributes 42 percent of all charts compiled in Canada and 75 percent of the publications.²⁶ The hydrographic survey of Canadian waters (carried out by British Admiralty surveyors) began in 1883 with the decision to survey systematically Georgian Bay, which had been the site of many marine accidents. The British survey ships were involved until 1910 although the responsibility for hydrographic surveys was coming more and more under the purview of the Canadian government.

Originally the field work was compiled in Ottawa and sent to England for engraving and publishing as an Admiralty chart. Due to the delay between survey and the publication of a chart it was decided to publish the charts in Canada. The first was issued using photolithography in 1903. In subsequent years, plates of the Admiralty charts, based on Canadian work were sent to Canada, and by the First World War the service was responsible for maintaining all of its own charts.²⁷

Today the CHS is primarily concerned with producing navigation charts including charts covering harbours and channels, tidal currents, fisheries areas, territorial seas, natural resource maps of the ocean and a special series of charts for the Department of National Defence. The Patricia Bay office is responsible for charting all of the navigable waters west of the Manitoba/Saskatchewan border including the Western Arctic (Beaufort Sea). In addition to this, the CHS publishes small-craft charts designed with pleasure boaters in mind, tide books, small craft guides, sailing directions for pilots, and catalogues of charts for each region. The diversity of marine cartography and the importance of the various editions have led the CHS to look to automation

to reduce the workload and costs. Automation is used to draw the charts once the compiled data from field sheets and other sources has been digitized (the representation of a quantity by a number code) or "converted into a computer compatible form for automatic drawing by a computer controlled plotter."²⁸ The CHS has been using automation for over sixteen years and the Regional Chart Superintendent of the Pacific Region is looking ahead to the day when "information collected in digital form can be transposed via automation to produce the final product."²⁹ Obviously the development of such technology will have an impact in the realm of records keeping as well as in that of records creation.

Cartographic records, whether federally, provincially or privately generated, may become even less accessible than they are today through the introduction of computer-assisted cartography. Automation enables agencies to create records which reflect programme planning and execution on a level considered too labour intensive to carry out otherwise. In Environment Canada, "conventional cartographic methods are frequently supplemented or [are] being replaced by computerized systems which, when operational, can offer greater flexibility in the interactive analysis and presentation of mapped information."³⁰ The application of computers to the science of cartography is changing the nature of cartographic records and the manipulation of data on a screen implies that processes such as the addition or deletion of data and the recombining of data into a new format, may never be documented permanently. Without generating hard copies along the way, it will be virtually impossible to document the process of a map's creation. Moreover, as cartographers develop ways

of fitting cartographic techniques into computer programmes, compiling evidence of the computerized cartographic techniques themselves will require specialized expertise and equipment. All of these have important implications for archivists accustomed to working with the physical form of the record rather than just with the unprocessed information itself. Cartographic archivists will have to grapple with the problem that the data is being added to and therefore is changing constantly. In meeting the challenge of machine readable cartography, the archivist may have to put aside some of the more traditional aspects of records keeping and take up the challenge of information management. Some of the implications of this as it applies to one important aspect of archival work, appraisal, will be dealt with in Chapter Four.

Comprehensive mapping of any area in British Columbia is often assured not by conscious design but rather through the large number of mapping agencies and overlapping of programmes. The needs of one government office dictate a map of a particular area at one scale while another office with different requirements will choose a different scale for mapping the same area. Because of duplication of effort in various government agencies, the Ministry of Lands, Parks and Housing was encouraged in 1952 by a report entitled "The Facilitation of Planning" to work towards the "rational surveying, mapping and filing of our land data base"³¹ by developing "a minimal number of standard-scale maps evolved from a common base, each serving a specific purpose. It [the report] justified a coherent system of cross-referenced filing and indexing for long-term benefits."³² This recommendation has gradually been implemented with the result that one office, for example, the Parks

and Outdoor Recreation Division, can become "a highly decentralized organization with its regions free to meet their mapping needs at their own discretion directly in the market place. In this the central service provides a coordinating and unifying function besides supplying highly competitive mapping products using both own-force and private sector means."³³

The cooperation between various government agencies is extended to the municipal sector as well. Municipal mapping on the lower mainland of British Columbia includes the 1:2500 land use information series covering Greater Vancouver; the 1:10 000 planimetric series formerly produced by the Greater Vancouver Regional District (GVRD) in conjunction with the Ministry of Municipal Affairs to describe boundaries of various land use designations and delineate the Agricultural Land Reserve; and the 1:50 000 scale used by the Regional Planning Department on its report maps. The Greater Vancouver Regional District was comprised of the region's fifteen municipalities and three electoral areas until it was disbanded in 1983. Two departments of the GVRD in particular, Regional Planning and Engineering, used maps. The Regional Planning Department was concerned with the GVRD's land use and transportation planning activities. The Engineering Department was responsible for the "design and maintenance of the regional water supply and waste disposal facilities."³⁴ Both departments had limited cartographic capability and depended mainly upon the provincial government for base maps. The functions of the GVRD have either disappeared or been assumed by the provincial government.

Finally, one last factor contributing to the complexity of tracing map production in government agencies of all levels is the dynamic nature of these agencies in their response to changing administrative organization. A provincial example will serve to illustrate the point. The Ministry of Environment's Terrestrial Studies Section of the Surveys and Resource Mapping Branch originated

from the Canada Land Inventory Federal/Provincial Programs, and the British Columbia Land Inventory, through the Environment and Land Use Committee Secretariat, to Resource Analysis Branch and now Surveys and Resource Mapping Branch.³⁵

It has recently been joined by Fish and Wildlife staff to expand products to include coastal and estuary habitat as well as wildlife information. As a member of this office commented, "Even the latest catalogue doesn't have the correct name on it."³⁶ These utilitarian changes affect the accessibility of the record series in various ways. Overlapping of series, while duplicating records in one sense, allows predecessor and successor series to maintain important continuity. Changing titles may well hinder awareness of availability of new series but it will also reveal new directions and development of programmes under the Ministry.

It is this dynamic nature of map production which has provided the rich and challenging legacy for cartographic archives in British Columbia. One repository cannot hope to retain all the mapping generated within a region, nor should one try. If repositories, scattered throughout a region, each manage to secure cartographic records documenting one small part of the context within which to view our

continuing place on the land and our effect on it, then they will have contributed to a potentially effective interactive system of identifying information. In the following chapter, three archives within an unofficial network in British Columbia will be considered in order to illustrate the challenges facing archives wishing to preserve cartographic records.

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CHAPTER II

Cartographic Records in British Columbia Archives

The diversity of cartographic materials is a challenge to be met by the collecting policies of archival repositories. This chapter proposes to examine three repositories in British Columbia in terms of the development of their cartographic collections. The Library and Maps Section of the Provincial Archives of British Columbia, the Vancouver City Archives and Records Service Division, and the Special Collections Division of the University of British Columbia Library have been chosen to illustrate how quite dissimilar cartographic collections can evolve within a small geographical area. In examining them this chapter will look at the establishment of the collections, the range of records within them and how they fit into the general framework of cartographic records production and use. The primary aim is to understand the practical limitations within which cartographic archives operate and to see the sorts of problems affecting collection policies.

Before looking at the three repositories, it is necessary to outline and define the terms described as cartographic records for the purposes of this study. The cartographic records typified by the holdings of the repositories under discussion include maps, both thematic (dealing with a single phenomena, such as weather) and general (showing spatial relationships of diverse phenomena as on topographic sheets). Maps may be historical or current, printed or manuscript. In addition to maps there are charts, fire insurance plans, atlases, microforms, and globes. The

Society of American Archivists defines cartographic records/archives as

records and archives containing information depicting, in graphic or photogrammetric form, a portion of a linear surface, such as maps and related materials (globes, topographic and hydrographic charts, cartograms, relief models, and aerial photographs), and related textual records.¹

Related materials should include records used or produced during the compilation of the map. These are records other than aerial photographs (which are usually housed separately in air photo libraries) such as master overlays, and blue-line proofs as well as associated textual documentation. For the purposes of this thesis, the term composition records will be used to refer to the records resulting from the mechanical processes which together compose the final map while supporting or related records will refer to related textual records such as reports and files compiled during the production of the maps. The repositories surveyed do not contain many composition records and, unfortunately, in cartographic records important evidential value, the contextual aspect, is lost if such records are not preserved in conjunction with the published map. The published map alone does not reveal the administrative policies which combined to create it. It is recognized that archives can neither hope to preserve the composition records for each and every map produced, nor should they. The composition records of those thematic and general maps considered seminal in the output of the agency together with the base maps on which they appear would exemplify what might be retained. If evidential value is that which characterizes "records of an agency that are 'necessary to provide an authentic and adequate documentation of its organization and functioning,'"² then it is important that some

composition records be retained showing how the final map came to be. Much opportunity for interpreting the data is contained within the composition records as they show how the accumulated data has been collected, evaluated, selected and generalized for final presentation on the map base thereby aiding the researcher in understanding the generalization process. The generalization process will be discussed further in Chapter Three.

Herman F. Friis, when writing in 1950 of modern map making agencies and their myriad activities, claimed that "these activities represent the life history of a map as, indeed, that history is expressed in the content and accumulation of the records."³ To be able to document those activities is important to researchers interested in understanding the development of contemporary map making. But the archivist's task is made difficult by the often daunting quantity of cartographic records and the diversity of type, and by problems of interpretation and, consequently, of referencing these same records. The solution lies in building knowledge of agencies creating cartographic records, instituting early and informed appraisal in the life cycle of the records, preserving related records, and meeting practical needs for secondary sources bearing on the history and production of maps. In addition, of course, repositories must provide basic storage facilities and staff to care for cartographic records. All these factors affect the attainment of the ideal for cartographic archivists. Archives have devised different ways of coping with limitations while fulfilling the terms of their mandates. The three British Columbia repositories which follow are introduced to illustrate three responses to the challenge of cartographic records.

Library and Maps Section, Provincial Archives of British Columbia.

The Library and Maps Section came into being in 1982 when a reorganization brought the Library Division and the Map Division under one authority. The mandates for the two parts of the Section have been brought into close alignment as shown in the objectives of the Section. The objectives set out do not constitute a collection policy but rather a flexible set of guidelines followed by the Section; however, this is the first time guidelines have been formally defined. The objectives are as follows:

Library of the Provincial Archives:

1. To support research in British Columbia history, including political, economic and social history, ethnology, the arts and literature.
2. To enhance the knowledge and skills of staff through the acquisition of professional literature.
3. To complement other collections in the Provincial Archives.

Map Collection:

1. To preserve and make available the published maps and the cartographic and architectural archives of the Provincial Government.
2. To support research in history, geography and cartography by acquiring and making available maps of British Columbia, as well as any other maps showing the development of geographical knowledge of this part of the world.
3. To contribute to the study of British Columbia's architectural heritage through the acquisition of plans by important architects of plans representative of building types.
4. To complement other collections in the Provincial Archives.⁴

The very extensive library of the Provincial Archives encompasses the valuable Northwest Collection of books and pamphlets which was begun by the first archivist R. Edward Gosnell.⁵ Gosnell, appointed the first Legislative Librarian in 1893, believed in the then current idea of archives and proposed that there should be "a special department relating to British Columbia, its official records, the history of earliest times and subsequent settlement, its progress and development, etc. comprising newspaper files, old books and pamphlets, and all other literature of Provincial interest that may from time to time exist . . ."⁶. His legacy, the Northwest Collection, remains a valuable research tool and the Library provides valuable reference material to the staff and to the public.

The first Map Collection objective, concerning official records, is the latest to come into focus, the other three objectives having been in place for some time and therefore are reflected in the collection as it now exists. The first objective anticipates the systematic retention of the records of the government map creators by the Library and Maps Section. However one problem arose when the Ministry of Environment issued a directive that all government departments (including archives), along with the map buying public, were to be charged regular prices for Ministry of Environment maps. Those purchase costs (usually \$3.00 per sheet) would have made systematic collection of official cartographic output prohibitively expensive for the Maps Section, however the Ministry has been phasing out its map publishing function.

Another difficulty which hampers the implementation of active acquisition policies by the Section is the shortage of staff and space. In the recent past this situation has been used to the best advantage for the tasks of implementing a new cataloguing system and the whittling away of the backlog to make the collection more accessible for research. However, in spite of such difficulties, records continue to arrive. Donations of private records are encouraged, auctions are watched for items of potential interest, published items from Departmental catalogues are ordered (where not prevented by Department policies such as that of the Ministry of Environment), and also by responding to disposal orders which, so far, have mostly involved architectural drawings.⁷ On occasion the opportunity arises to copy privately owned architectural drawings. Maps are also transferred, either in the form of copies or the original itself, from collections held elsewhere in the Archives. For example, photocopies of letters and sketches contained in the Colonial correspondence held by the Manuscripts and Government Records Division are sent "for the Division's reference" by the Manuscripts Division archivists. Any other information such as copies of correspondence accompanying the item in the original file, are also sent and kept in the Library and Map Section files together with lists of sketch maps and plans retained by the Manuscripts and Government Records Division. This procedure is followed to preserve the information regarding the provenance of the records and provide the immediate context of material which has been divided, because of the form or medium it takes, from the main body of the records.

The Library and Maps Section's range of interest is broad. Chronologically it spans from the earliest beginnings of European exploration of the Pacific coastline to the present, and encompasses a geographical span from coastal South America to coastal Alaska. Inland the coverage extends from the early days of New Caledonia to the current main focus on the land within the modern political boundaries of British Columbia. Because the Section cannot acquire all the records generated which relate to its wide interests, it also provides information on the many maps available in other agencies by keeping on hand catalogues of published maps and directing researchers to cartographic materials held by such agencies as the Land Titles Office of the Ministry of the Attorney General and the Surveys & Lands Records Branch of the Ministry of Lands, Parks and Housing. The Surveys & Lands Records Branch, Legal Surveys Section holds surveyors fieldbooks, historic plans such as early town sites, and maps of Indian reserves and roads and trails. This material, though typical of what is normally considered historic and therefore archival, is still referred to, in many instances, by the professional staff of the Legal Surveys Section. It is not unusual for cartographic records to be preserved and reused for other purposes over long periods by the offices which create them. Many composition records, including everything from surveyors diaries and aerial photographs, to the various photographic negatives showing drainage, roads or parks, may be reconsidered, reassembled and reissued in the form of a completely different map, perhaps by a different Ministry or Department. Cartographic records, in cartographic archives as well as creating offices, tend naturally to be part of an ongoing chain of information.

The role of the Library and Maps Section has altered substantially over the years partly because of economic restrictions and partly because of a changing focus of collecting. When money is available, gaps in the historical record of the early maritime and continental fur trade are filled where possible. Also, transfers of records remaining in various government vaults will add valuable research material to the Section's holdings. However, in practical terms, the Section is interested primarily in receiving its sponsor government's map series as well as published maps relating to British Columbia and the Yukon produced by such agencies as the Hydrographic Service, the Geological Survey and published maps from private agencies. This collection policy reflects not only the scarcity and therefore the costs involved in collecting early material, but also a recognition that the current records are best collected now while they are in pristine condition and complete series can be more easily obtained at minimal cost.

Vancouver City Archives and Record Services Division.

On May 16, 1932, James Skitt Matthews was appointed archivist for the City of Vancouver by a Special Committee of the City Council in recognition of his long commitment to collecting documentation pertaining to the city's development. At this time the archivist was put under the jurisdiction of the Public Library Board and was a member of the Library staff. This had changed by 1933 when the City Archivist was placed under the administration of City Council and moved to an office at City Hall. Responsibility for the archives moved back and forth among differing

overseers until 1957 when the City of Vancouver was appointed to be its sole trustee. In 1972 it came to its new and permanent home under the office of the City Clerk.

Specifically, the Vancouver City Archives and Records Service Division is under the City Clerk's office, a division of the City Clerk's Department, City of Vancouver. "The Archives is responsible for acquiring, preserving, and making available the historical records of the City as well as related historical documents."⁸ This pared down mandate contrasts with the Major Matthews era when a policy of "the preservation and custody of the historical records and relics of the City of Vancouver, and surrounding communities of North Vancouver, West Vancouver, Burnaby, Richmond, and, in a lesser degree, Squamish, Gibsons, and Port Moody"⁹ resulted in "a mass of historical papers and pictures"¹⁰ being collected through the consuming interest of the archivist, Major Matthews. However, for various reasons, the city administration was reluctant to deposit official records with Major Matthews. Today, a vital part of the Archives mandate is the operation of a records management programme and records centre services to all City departments, boards, and commissions. Cartographic records, both graphic and textual, are included. The Archives has had a programme of culling its cartographic holdings to remove and transfer maps not pertaining to Vancouver. In 1983, 75 percent of the total map collection related directly to Vancouver proper.

The records management programme in place ensures there is a vehicle

for systematic transfer of records from the City of Vancouver Department producing them. Of the 610 records retention schedules implemented by December, 1982, 56 were for the Planning Department, a major cartographical source.¹¹ The Archives also holds Greater Vancouver Regional District (GVRD) maps on microfilm. In addition, the index to the Major Matthews Photograph Collection contains a listing for maps he collected personally. Maps within other manuscript collections housed in the Archives are not separately listed.

The Vancouver City Archives and Record Services Division is primarily concerned with systematic acquisition and preservation of City records. The Archives does not interpret its role to acquire maps or other records actively from private sources mainly due to the shortage of space; the space available being earmarked for records transferred from the municipal offices, which are the Archives primary responsibility.¹² Potential donors of private records are directed to an archives with a wider mandate unless the donor specifies that the records come to the Vancouver City Archives. Corporate donors are encouraged to maintain their own records where possible.

Special Collections Division, University of British Columbia Library.

The Special Collections Division has a dual function, housing both a rare books collection and the University archives. This has been the situation since 1960, the year the Special Collections Division was formed to bring together collections of rare and "special" books held by

the University of British Columbia Library, the University archives, as well as historical maps, manuscripts and photographs.¹³ A basis for the present-day collection was put in place shortly after the University was established (1914). By 1920, interested persons had established the Committee on University Archives.¹⁴ This Committee gave way in 1960 when Special Collections was formed to take over the care of the donated material as well as rare and special books. Although maps relating to the history of the Pacific Northwest had been donated to the Library as early as 1931, it was not until 1966 that a full-time staff member was put in charge of maps. The focus of the Division from its inception has been "general Canadiana, strong in source material for a number of topics: British Columbia, the fur trade, the War of 1812, the Riel Rebellion, the 1837 Rebellion, and Canadian travel and description to 1900."¹⁵ Archival material donated to the University has traditionally been given to the Library but once the archives was in place such records were deposited under its care. Thus the University Archives and the historical manuscripts collections are now joined with the Special Collections Division.

The historical map collection in Special Collections has been steadily increasing in scope. It is a source for topics in Canadian and Pacific Northwest history, the history of cartography (the history of the artistic, scientific and communicative development of cartography itself) and the historical cartography of North America (the history of man's exploration and discovery of the world's geography). As well as being added to by interested faculty members, the collection has managed to

grow despite monetary restraints by acquiring reprints and facsimiles of expensive and rare historical items. The archives component within the Special Collections Division works with other British Columbia archives "to ensure that archival material of provincial and local significance is acquired and properly preserved for the use of present and future generations."¹⁶ Cartographic records generated by the University are represented by campus plans "ranging from photographs of manuscript plans submitted in the Provincial Government's competition for a university in 1912 to the latest plans on three scales compiled from aerial surveys in 1930."¹⁷ Faculty, staff and students working under the University's aegis generate cartographic materials (such as the British Columbia Atlas of Resources) which find their way not only into Special Collections but into the Map Library and the Geography Department's Map & Air Photo Centre as well as into the Main Library itself. In addition, cartographic materials in manuscript collections are inventoried, and stored in map cabinets, and copies of the inventory kept with the collection finding aid to preserve a record of provenance. The acquisition policy for the map collection states that,

maps, atlases and reference material supplementing existing holdings have been acquired. In order not to duplicate maps kept in the Library's Map Division, maps of a later date than 1900 are not normally acquired. However, for conservation reasons sets of the various map series of the old British Columbia Department of Lands, such as the Pre-emptor's, Degree, Topographic, Regional and General series are kept in Special Collections. Other twentieth century maps are acquired only if they are rare or fragile, except in special areas of study such as fire insurance plans.¹⁸

From looking briefly at these three British Columbia archives we can

see that much of their earliest cartographic material owes its existence to the antiquarian activities of a few individuals with wide-ranging interests in the history of the province. Maps and plans were always part of the general mass of papers being preserved for the historical interest in a more or less haphazard fashion. But in view of the fact of today's volume of map production, such haphazard and uncoordinated activity is unlikely to result in the preservation of a complete cartographic record. In response, repositories have had to develop guidelines to cope with the volume and plan for the retention of all cartographic records of permanent value. The two classes of cartographic records which have permanent value and which can be found in most archives including the three mentioned above, are those which comprise an historical map collection and those which comprise cartographic archives.

The early map collections of the three repositories evolved out of the general historical collections intended to document the colourful history of the Pacific Northwest. The idea of cartographic archives in the form we know today came into focus later as it is evident that the diversity of mapping, particularly since 1871, was not reflected in these particular collections. In the Provincial Archives of British Columbia, some of the gaps from the early era of public records in British Columbia have been filled in by the transfer of cartographic materials dating from the Colonial period (1849 to 1871). Although the nature of archives was changing through the early decades of the twentieth century with the growing realization of the importance of the government as a producer of records, by 1934 when W. Kaye Lamb assumed the office of Provincial

Librarian and Archivist the collection of public records by the Archives was still haphazard. The Provincial Archives did not, and still does not have completely adequate legislative authority to back its acquisition of public records, and is therefore hampered in its efforts to initiate the systematic appraisal and acquisition of cartographic records without it. Under the Document Disposal Act, Chapter 95, RSBC 1979, the Provincial Archivist is named as Chairman of the Public Documents Committee which is empowered to make recommendations concerning the destruction of documents. But the Act does not give the Archives the authority to become involved in the planning for the eventual disposition of records early in their life cycle, and in particular does not mandate deposit of all maps published by the government in the archives.

In 1983 the Provincial Government instituted a records management programme to supplement the operation of the Document Disposal Act. This programme was set up, not as a records management system as such, but as an agency to provide advisory services to Ministries in the establishment of a records management programme.¹⁹ One of the purposes of the programme is the encouragement of records scheduling so that inactive records are channeled to a records centre and that final disposition either by destruction or transfer to the Provincial Archives, is handled through one central bureau. However to those outside the two offices (the Records Management Branch and the Archives) the linkage between them may appear slight if it is seen as existing at all. This does not help to make the connection between archives and records management any clearer. In addition, the advisory function of the Records Management Branch precludes

it from exercising any real authority over the non-current records held by the Ministries. The final decision regarding the implementation of records management is still controlled within the Ministries themselves. The various divisions of the Archives, including the Library and Maps Section, would have benefitted more if there had been direct communication between the Archives and Records Management Branch as one body and the Ministries as another. It is to be hoped that the Branch, besides helping to organize the proper disposition of the records, can also find a way to provide a much-needed link bringing together the economic interests of the Ministries with the cultural interests of the Archives.²⁰

The three repositories under consideration here have quite different cartographic holdings reflecting the mandates of their sponsoring institutions. Each archives has a separate sphere of responsibility with the collections of the Provincial Archives and the Vancouver City Archives focussing now on official records while Special Collections houses both University records and historical manuscripts. In addition Special Collections retains the "records of Societies and Associations closely associated with the University such as the Alma Mater Society."²¹ The influence of records management on the holdings of the Vancouver City Archives is well established and is reflected in the confidence with which the Archives has set its collection policy, to the point of giving up items not falling under its mandate. The Provincial Archives has yet to reap the benefits of such an established system but by formulating its objectives it has made its intentions and the

direction it wishes to take known to the Records Management Branch. The Library and Maps Section deals with the widest range of the cartographic record as the Provincial Government is the primary map making agency and is in the vanguard of evolving cartographic technology. Although it is not the archivist's job to interpret the record for researchers, archivists need to have an awareness of the cartographic processes and technology if they are to help make some of the more abstract concepts in maps more intelligible to others. This topic will be discussed in the following chapter in an attempt to try and outline some aspects of cartographic communication important to the understanding of maps.

NOTES

CHAPTER II

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7. Geoffrey Castle, conversation with Margaret Hutchison, 5 November, 1982.
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9. John Hall Archer, "A Study of Archival Institutions in Canada." (Ph.D. diss., Queen's University, 1969), 458.
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12. S. Baptie, class lecture, 15 October, 1981.
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15. Laurenda Daniells, "The Special Collections of the Library of U.B.C.," British Columbia Library Quarterly, 36 (1973): 52.
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CHAPTER III

The Cartographic Communication Process and Archives

The previous chapters have attempted to outline some aspects of cartographic records keeping which archivists face in the administration of cartographic archives. The process of map making itself is complicated and sophisticated. The mapping of an entire country or province can only be carried out within a complex structure designed to support many programmes. Therefore the administrative history of the map making agencies and their interrelatedness is substantial. The cartographic archivist is also concerned with the development of the science and art involved in transferring data about the earth into a mappable form. The adjustments which must be made during this process affect the eventual interpretation of the data shown on the map. Cartographic archivists therefore need to be aware of the study of cartographic communication not only to help researchers understand maps more clearly, but to increase their own understanding of the importance of the preservation of cartographic records documenting the complete range of the necessary adjustment and manipulation of cartographic data.

Modern maps are created according to many rules and conventions which can be used selectively by the map maker to create a map unique to an agency. These records become strong indicators of the policies of the agency. Because map overlays can be rearranged in various combinations to produce several different maps and the raw data used again in the creation of entirely new maps, cartographic records maintain an ongoing

currency to the originating office. Therefore, the creating office becomes the best source of knowledge of how the data is utilized over time. This is information which neither the cartographic archivist nor the researcher can usually determine from the published map alone. Therefore, with many of the records documenting the map making process (the component parts of cartographic communication) only available in the agency, the potential is there for the agency to play a greater role in the interpretation of the records. It can also become, and be recognized as, part of the cartographical information network together with archives and libraries.

Cartographic communication results from the skillful blend of graphic art and science. Map makers express creativity in arranging elements such as colour, lettering and pattern which, when organized together on the map, represent the geographical data. Of course, this creativity is bounded by the limits set by the purpose of the map which will influence the eventual effectiveness of it. Henceforth, the term cartographic communication will be used in the context of the information contained in the making of a map rather than of the information "on" the map. In other words, the term refers not to where a feature is located on the map, but the how and why it is shown. The discussion here involves information presented in-the-round or pictorially wherein each aspect of the subject is presented so that each is read, or seen, in relationship with the other. This is in contrast to information presented in a serial manner, each aspect following another in linear fashion as in textual records. Awareness of the difference in reading textual materials and reading

cartographic materials lies in the perceptions of the reader. Mapped information, that is, information about the earth's natural as well as cultural features, presented on a two dimensional sheet of paper is a visual form of communication with its own demands of accuracy and like a picture or a photo cannot be quickly read or interpreted.

As with the evidence in photographs, map content should be viewed within the context of the purpose for which the map was created. The unique problem of map making is that the map is trying to portray a portion of the earth's surface which is an enormous and constantly changing phenomenon. Obviously, a single map sheet cannot portray any geographical area in sufficient detail without modification of that detail. We know the degree of modification from the scale. For example, the scale 1:63,360 (1 inch:1 mile or 63,360 inches) where 1 is equal to the unit on the map and 63,360 is equal to the corresponding unit on the ground means that for every one inch on the map 63,360 inches or 1 mile of ground is represented. This allows a certain amount of detail from that mile to be shown much larger than it would on a map where the one inch corresponded to 316,800 (1:316,800 or 1 inch to 5 miles). 1:316,800 is small scale where detail from five miles, to be shown within an inch on a map, must necessarily be made small, so that features such as paths and buildings would be too small to be represented. The smaller the scale the fewer the number of physical features which can be included. Scale often determines whether a map might be suitable for a particular need. Also, scale is the most important control guiding a cartographer when generalizing detail for a map.

Cartographic generalization is the collective term for the modifications employed to balance the effect of reducing the earth's features to a mappable form.

Reduction, when applied to earth phenomena, is . . . accompanied by inescapable changes. Distances separating features and widths and lengths of features are reduced in the ratio of the reduction. Adjacent discrete items become more and more crowded, clarity is generally reduced, and there may be an increase in the relative visual importance of the general compared to the specific.¹

Obviously, earth phenomena are symbolized and reduced to fit on the map and the resulting distortion in the data would render that data incomprehensible without skillful manipulation. The cartographer's skill involves manipulations of the data that represent information to be mapped by means of simplification of data (elimination of unwanted detail), classification or ordering and grouping of data, symbolization, and induction.² As the scale of the map becomes smaller the data chosen must represent all the rest of the data within that class. For example, on a large scale map, 1:63,360 or 1:50,000 many buildings, small hamlets, towns and cities may be shown whereas on a small scale map, 1:316,800, buildings will certainly not be shown, hamlets may not appear, towns may appear only as dots, and cities as circles. The choice of which data will be left off and which then becomes representative of the area depends primarily on the purpose of the map. On a general map, roads of all types may be shown together with towns, airports, and other points of interest. On a thematic map, such as one displaying population, the airports, points of interest, and roads may be left off to allow the theme to be portrayed clearly.

Since the reality of the earth and the "reality" on the map are not synonymous, the reader must be aware of, and know how to interpret the "reality" on the map. This awareness or perception has been called "graphicacy" by British researchers. In 1965 the term graphicacy was proposed "to describe the educated counterpart of the visual-spatial aspect to human intelligence and communication."³ The researchers attributed other aspects of human intelligence to educated linguistic ability or literacy; educated numerical ability or numeracy; and ability in social intercourse, or articulacy.⁴ Graphicacy then, is the ability to communicate spatial information by other than verbal or numerical means, that is, through patterns or plans, in the depiction of the earth's geography. It is the educated counterpart to the intuitive, and is a skill which can be acquired by both map makers and map readers. Studies of pre-school and school children in Britain showed that the ability to read maps, to conceptualize the content of a map, begins quite early, by about three or four years of age when children begin drawing pictures and "maps" and therefore it has been concluded by researchers that graphicacy skills could reasonably be taught in the beginning stages of school life.⁵ Since it is the reality which the map reader is seeking, the mental maps that the reader carries with him, compiled from accumulated lifetime experience, may inhibit and certainly influence the full and/or correct impact of the map. As Monmonier observes, "Both map reader and map author have active rather than passive roles in cartographic communication--both should attempt to understand the communication process; both must strive to make it effective."⁶

The knowledge of the map user is the necessary complement of the map maker's skill in transmitting information about the earth's surface. The scientific precision of a map is lost on readers if they simply accept what the map appears to be saying without questioning whether they are seeing the information in terms of their own inaccurate or incomplete images. Muehrcke states, "Map and reality are not, cannot, be identical. Most map reading mistakes occur because the user forgets this vital fact and expects a one-to-one correspondence between map and reality."⁷ And, as explained by Hugh Brody in Maps and Dreams, maps may present the outline of a story but the details must be filled in by the reader's informed imagination. As the environment as it is cartographically represented may be unfamiliar to us, the communicative map enables us to reach closer to those unfamiliar perspectives about which time and/or circumstance has denied us firsthand knowledge. Also, maps can offer a connecting link to the past, allowing readers to view historical events through access to contemporary biases, popular opinion, misconceptions and interpretations of events present in the records. These intangible aspects of history cannot be totally recreated but a sense can be recaptured by graphicate readers. The study of history is enhanced by such a link which, when combined with accompanying textual and photographic (in recent history) evidence, provides the modern viewer with a picture closer to that actually seen by the original participants.⁸ Thus graphicacy has much to offer the map user.

Although the map user must take some responsibility for the amount

and quality of information he gains from the map, the map author also is, or should be, aware of the reader's varying levels of knowledge about the map and how its information can be gleaned. The map author starts the mental process of designing a map by defining his purpose or intended message and by choosing his means of presentation or mapping technique, both of which are calculated to elicit certain responses in a map reader.⁹ The effective transmission of information is aided or hindered through an artistic rendering of colours and shapes representing the data. Impressions are created through skillful choice of tone, shape or pattern which present data in a way which may suggest answers to the reader's questions.¹⁰ For example, intuition, perception, or common sense tells a reader that a deep colour tone has more "weight" therefore more "value" than a lighter tone. Symbols are chosen, and have traditionally been chosen according to what has been discovered to "look right," or put another way, what symbols and techniques have elicited the correct response from the readers. Much research has been done on readers' reactions to various manual mapping techniques, and continues with the advent of automated cartography.

As manual techniques give way to automated techniques, purely intuitive choices by the cartographer must give way to a combination of intuition and mathematical theories.¹¹ Cartographic intuition learned through study and apprenticeship trains the mind and eye in plane surface representation. Now, in addition, the structure of a map must be broken

down and analyzed so that it can be reproduced mathematically by automation. Symbols may present quite different messages on a computer screen. All of these psychological facets of cartography are studied under the rubric of information theory,¹² which follows data from the source (data gathering) through transmission to the ultimate destination, the reader. Study of this progression allows cartographers to see where errors can occur thereby enabling them to rectify any problems and lessen the possibility of the wrong message being received. As well, design and format are not only carefully chosen to enhance maps' effectiveness but for the practical purpose of maintaining a reasonable size of final document in order to accommodate housekeeping requirements for duplication and storage.¹³ Generalization is the most intricate of design questions, in both manual and automated cartography, with considerations of scale and projection as well as choice of information being difficult and vital matters of concern. In avoiding clutter and confusion the degree of generalization chosen depends on the scale, the complexity of the data, and the purpose of the map.¹⁴ It has been pointed out that "the history of maps is to a large extent a centuries-long struggle for accuracy in showing form, direction, size, relief, and other details,"¹⁵ and one of the basic elements affecting a map's design is mathematical scale.

'Maps, aerial photographs, and architectural drawings are prepared according to precise measurements and calculations, and any alterations

introduced during their reproduction or conservation may alter or distort their information."¹⁶ When beginning the process of generalization, the choice of scale, being one of the first steps in creating the map, determines the amount and type of data chosen and the way it is depicted. The smaller the scale of the map the larger the area that can be shown but the less detail that can be seen. The larger the scale, however, the smaller the area shown and the greater the amount of detail. The purpose of the map will determine the scale and therefore the degree of generalization needed.

Symbolization and the choice of map projection (any systematic arrangement of meridians and parallels, portraying the curved surface of the sphere or spheroid upon a plane)¹⁷ also affect the success of communication. Cartographic symbolization, the rendering of data into a representative, graphic form, can obscure meaning for the inexperienced reader and can also "impart an incorrect visual impression of precision and accuracy to poorly simplified or classified data."¹⁸ The cartographer, in choosing the appropriate symbols, must take into account the reader's untrained eye or inexperienced visual perception. Familiar symbols such as graduated circles, cubes of various sizes and varying densities of shaded areas can be clearly differentiated when viewed side by side but become difficult to compare when spread over the map. Obviously the largest and smallest, lightest and darkest, are easy to identify but the values in between are not as clearly distinguished from each other. When comparison is difficult, the validity of the

information represented by those middle values may be minimized or misread. Some methods of symbolization are more appropriate for particular uses than others but "as cartographers shifted from simply showing the locations of tangible features to depicting intangible phenomena and the structure of spatial distributions, maps have become increasingly complex."¹⁹ The problem in representing intangible phenomena by geometric symbols is that the phenomena become constrained. "What begins in total, integrated wholeness ends up bounded and separated."²⁰ And also, since it is not possible to represent all aspects of the environment, some factors will necessarily be left out and the phenomena simplified. This can also work to advantage in the communication process since it isolates, and hopefully illuminates rather than obscures the subject under examination. The map enables the reader to study the cultural and physical environment without the necessity of standing on street corners or on the banks of rivers. Relationships of space are reproduced in a microcosm on the map.

Another important aspect of symbolization is projection. Map projections are the technical response to problems of transferring a portion of the spherical surface of the earth to the plane surface of a map sheet. The process of transferral involves the use of projections by which the data is manipulated to fit realistically into another shape. Due to the various ways such projections can be produced, this manipulation results in different kinds of distortion. The cartographer concentrates on "their [the projections'] properties and their uses and on how to employ a projection to fit the characteristics of the

distributions that are being mapped."²¹ Briefly, the properties referred to above which differentiate the classes of projections and which affect the presentation of data are as follows: a) conformality, or preservation of the shape of the earth's land and sea masses; b) equivalence, or preservation of areal extent; c) equidistance, or preservation of true distance from point of origin. Obviously then, choice of projection will affect the information portrayed. For example, a dot map comparing quantities of wheat yields between countries requires the quality of equivalence so that the information is not distorted during the cartographic process. Although no projection will exactly reproduce the earth's reality on a plane surface, a realistic objective is to choose the one which will enable the truest impression to be conveyed. What is important is the clarity of the objective and the consequent application of appropriate cartographic techniques. Ineffective or confusing maps will lead readers astray, or simply not be used at all.

Beyond the map are other influences on the map subject which are part of the cultural sphere. This is in keeping with Muehrcke's view that "it is essentially the mapped world, not the map, which we are trying to understand."²² He then goes on to say, "Making maps simple does not change the world; it only lets us treat it, for certain purposes, as if it were uncomplicated."²³ Maps can be read for certain content just as a book can. The reader may select what it is he or she needs, by inference if necessary, before critically or analytically

examining the entire map as an item itself. It may indeed be that some map readers are easily influenced by graphic representations and, as with photographs, accept their veracity uncritically.²⁴ However, for the map reader it is important to remember, again, that it is "the actual situation on the earth that is significant" and that maps "have definite limitations as well as certain unique capabilities."²⁵ The map may also be enriched by the reader's own perception of the information being presented. The imagery contrived by the graphics, including the conventional signs such as letters and digits, is given credence by the experience of the viewer. For example, a contour which is small in diameter and which is labelled with elevation and name (e.g. Mt. Baker) has an immediate impact on someone familiar with the geographical reality of mountains. With the mountain's height in mind, the contour gains in meaning as it appears to reach up towards us thereby triggering a realistic vision in the mind of the reader. Conversely, the larger contour becomes equated with lower altitudes as it carries the eyes out to the sides widening and flattening the feature in the mind of the reader. But to those familiar with the actual features, it will take only a little time to learn to see the feature on the map. This is analogous to the way in which stereoscopic glasses reveal rugged terrain only when the eyes and the mind have learned to perceive the peaks and valleys flattened by the perspective of the airplane's camera. As a reader's experience with maps grows, visual images will be correctly remembered, prompted by the increasingly familiar cartographic symbols.

Direct experience in the world around us provides the means whereby

"we come to grips with the world around us through the process of cognitive mapping. This mental activity begins at birth and continues for the remainder of our life."²⁶ In order to make sense of all this information, we

classify things, and we simplify and compress many things into just a few, for the sake of clarity and comprehension. Such a transformation of many things into one is termed homomorphic mapping, e.g. constructing a single, representative mental map from the many individual viewpoints of people in a group. Every map and model we construct of the world around us represents a simplifying many-to-one homomorphic transformation.²⁷

The cartographic process itself may be termed homomorphic wherein many threads of information from different sources are brought together to become a map. By studying the origins of these threads in the composition records and the related cartographic records and the processes involved in their selection over others, it becomes possible to determine how the map became what it is. This inside view will help in the interpretation of the map since the map is the end product of a great deal of sequential ordering of data from the initial steps of field surveys and air photos to the last step of publishing. This linearity of map creation, in which "their content is presented serially, within time,"²⁸ presents the reader with one view of the cartographic process as well as the above-mentioned in-the-round view of the map itself.

As this chapter has tried to show, there is an added quality in cartographic records production which complicates both their retention and use, and that quality is the interpretive complexity of the record.

The dynamic nature of map production results in a wide variety of map agencies, each one evolving with some particular purpose in mind to represent a particular view of the landscape. We have found that a wide selection of maps from different map makers presents us with a more comprehensive idea of geographical or geocultural features. But maps are more than just illustrations of where an incident occurred or where a town is located; they are evidence of attitudes and policies and they can also be used as instruments of propaganda. For these reasons it is important that the composition records, as well as the map, be available for consultation if needed. However, practical difficulties facing archives in their attempts to acquire cartographic records have resulted in a less than complete record being available for research.

The ongoing utility of some stages in the cartographic process (such as base maps) and the continuing value to the agency of other records (such as surveyor's notebooks) means these records stay with the agency even though they may possess research value. In some instances in British Columbia such records are being made available for research. The Legal Surveys Section of the Ministry of Lands, Parks and Housing retains historical material such as surveyor's notebooks and early townsite plans. Although researchers can be accommodated, the Section is not primarily a research facility. The engineers on staff can assist researchers, but their reference service is necessarily limited. These offices are a necessary adjunct to cartographic archives and could be the beginning of a recognized network of cartographic agencies, including land registry offices, and map sales offices, together with research

facilities including archives and libraries. Together all these agencies would help identify where components of the cartographic record of a region are located, while the archives could coordinate intellectual control over them. Cartographic records lend themselves to the concept of networks as cooperation amongst agencies may already be a part of their creative lifespan. Also, the diverse and complex nature of the life of cartographic records cannot really be adequately understood from only one point of access where only one stage of the record may be found. A cooperative network, in which the cartographic archives plays a role within the cartographic system, would help increase the visibility and validity of cartographic records as an information source.

This chapter aimed at underlining the idea that archivists need a knowledge of cartographic communication if they are to understand that it is within the total cartographic record that evidence of man's view of his physical environment will be found. In addition, an understanding of the intent behind a map is dependent upon having records available which document those processes. Such knowledge equips archivists to argue for preservation of more than just the maps themselves since it has become clear that maps are more than simply guides to various phenomena. Instead, it is the total of the maps plus their composition and their related records which tell the history of man's coming to intellectual grips with the physical environment. The topic of the actual acquisition of these records will be dealt with in Chapter Four.

Notes

Chapter III

1. A. Robinson, R. Sale, and J. Morrison, Elements of Cartography, 4th ed. (New York: John Wiley & Sons, 1978), 149.
2. Ibid., 150.

Simplification: The determination of the important characteristics of the data, the retention and possible exaggeration of these important characteristics and the elimination of unwanted detail.

Classification: The ordering or scaling and grouping of data.

Symbolization: The graphic coding of the scaled and/or grouped essential characteristics, comparative significances, and relative positions.

Induction: The application in cartography of the logical process of inference.

3. G.W.G.V. Balchin, "Graphicacy," The American Cartographer 3 (1976): 34.
4. Ibid., 33.
5. M.S. Monmonier, Maps, Distortion and Meaning, Resource Paper No. 75-4 (Washington: Association of American Geographers, 1977), 37.
6. Ibid., v.
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9. M.S. Monmonier, Maps, 9.
10. R. Arnheim, "The Perception of Maps," The American Cartographer 3, No. 1 (1976): 6.
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13. Lloyd Houston, "Paper prepared for: Canadian Cartographic Association meeting, New Westminster, March 26, 1983," (Paper delivered to the First Regional Meeting in British Columbia of the Canadian Cartographic Association, New Westminster, B.C., 26 March, 1983), 4.
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17. Glossary, AACRII (CM).
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20. Ibid., 10.
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22. P.C. Muehrcke, Map Use, 2.
23. Ibid.
24. S.W. Boggs, "Cartohypnosis," The Scientific Monthly 64, No. 6 (1947): 469.
25. Ibid., 473.
26. P.C. Muehrcke, Map Use, 3.
27. P. Gould and R. White, Mental Maps, Pelican Geography and Environmental Studies, ed. Peter Hall (New York: Penguin Books Inc. published in Pelican Books, 1974), 52.
28. H. Taylor, "Documentary Art and the Role of the Archivist," The American Archivist 42, No. 4 (1979): 420.

CHAPTER IV

Conclusion: Cartographic Records in Archives: A shared Resource

In the previous chapters we have taken a brief look at the administrative complexity of cartographic agencies and their records; at how the cartographic collections of three British Columbia repositories have evolved and at the intellectual complexity of the records themselves. In this fourth and concluding chapter the topic of the appraisal and acquisition of cartographic records will be considered.

In archives, a map is given added meaning as a record of activity by the presence of supporting documents both textual and graphic. Archives which concentrate on obtaining the published maps alone, important as they are, risk ending up with a library of such maps, while the records which can provide important information about the creation of the map are missed. The concept of cartographic archives implies an interest in more than the subject content of discrete maps; and that is an interest in how the map came to be, information which the published map alone cannot provide. Often, however, maps are collected as discrete items rather than as part of the range of records of an agency. This separation of the map from the other cartographic records has led to some misunderstanding about the retention of maps by archives.

Many archives have used library methods of acquiring cartographic material, using catalogues put out by government map agencies as well as central map clearing houses to locate and select maps. The tendency is

to focus on the subject content of a map: that is, the specific coverage of a particular area which has led to "emphasis . . . on individual documents or sets of documents rather than series or groups."¹ This is one reason why many collections are made up of discrete published items rather than organic bodies of records. To some viewers, particularly those from the field of library science, these published maps are usually considered in the manner of other publications, and as such they are deemed to belong in libraries. In 1979, a report entitled The Future of the National Library in Canada stated that "maps, universally recognized as 'library matter,' are consequently implied in the definition of 'book' outlined in Section 2(B) of the National Library Act."² In the Act, book is defined as

library matter of every kind, nature and description and includes any document, paper, record, tape or other thing published by a publisher, on or in which information is written, recorded, stored or reproduced.³

The Report uses this definition and the assumption that maps are everywhere recognized as library matter to argue that official maps (those produced and published by and for government agencies) should be retained in the National Library rather than in the Public Archives of Canada. There is no question that the National Library should have copies of maps for its reference service but the concept of these maps as more than publications, that they are in fact records and that archives are interested in contemporary records are issues which have not been recognized in the Report. The idea that archives need only "a small collection of maps deemed to be essential to support general historical

research on Canadian subjects"⁴ is to deny the whole purpose behind archives generally, and cartographic archives in particular. The traditional idea that archives are repositories for only rare and unique items lends a museum-like quality to archives. There are references in the library science literature to archival cartographic records being those "intrinsically valuable . . . for their rarity."⁵ The implication seems to be that archival maps are valuable artifacts reserved for specialized use. In terms of cartographic archives, the acquisition of beautiful and rare examples of early cartography, for example the elusive *mappae mundi* (maps of the world), is often thought to be their primary interest and certainly it is these items which catch the interest of the general public. But most cartographic archives today are primarily concerned with the challenge of acquiring the cartography of the last few decades and of the present in order to bequeath a comprehensive cartographic record of our era to the future.

The majority of cartographic archives are concerned with retaining the records of their sponsoring institutions, most of which are municipal, provincial or federal governments. Published cartographica, although mainly produced for public consumption on a wide variety of subjects, is still the result and reflection of a series of administrative and technical functions. The maps are evidence of data selection policies, map making skills, and map printing techniques. Being products of administrative decisions, published maps have important significance when considered in relation to other documentation of the cartographic process. Published maps are in archives, therefore, because they are

part of the evidence of how an agency functioned and why it existed and not only because they are useful for reference. In order for the maps to fulfill their role as records of the agency, however, the full range of the record, from data collection to the final map, must be taken into consideration. This is where the diverse stages and uses of the records, and the technology which produces them, result in added responsibility for the archivist who appraises the value of the cartographic record.

In the past archives have mostly been the passive receivers of records. The concept of selecting records for retention, deciding which records could be destroyed, and taking an active part in the growth of an archival collection is a relatively recent one in the archival profession. This dates from the 1940's when records production proliferated and records management began in the United States.⁶ The cartographic archivist, dealing with the records of the esoteric discipline of cartography, soon becomes aware that he/she must be knowledgeable about historical, administrative and technological complexities of the records in order to develop the familiarity necessary for effective appraisal. Appraisal, or selective retention, has been defined by the SAA glossary of terms as

the process of determining the value and thus the disposition of records based upon their current administrative, legal, and fiscal use; their evidential and informational or research value; their arrangement; and their relationship to other records.⁷

Appraising cartographic material involves defining the range of records to be considered. The cartographic archivist will likely find

that a survey of agencies identified as those which produce maps will have to be augmented by a survey to determine the types of records produced by each from the point of data collection onward. This task is made difficult by the complexity of the various stages in the cartographic process, and the fact that some products such as base maps and thematic overlays are shared amongst map producers. Consequently, some activities may be obscured in the bureaucracy and the records hard to identify. Maps, with their independent layers of information can be adapted to many uses beyond their initial purpose. It is still important however to identify the ones which have historical significance or potential research value but which are still being consulted and held by the creating agencies. However, the ongoing usefulness of such records may make it hard to determine the point at which they become noncurrent. The Land Titles Office in Victoria is filled with such records and the Legal Surveys Section of the Ministry of Lands, Parks and Housing retains surveyor's notebooks and townsite plans from the colonial and fledgling provincial government periods. These sorts of records are usually not open to appraisal for eventual transfer to the archives as early as other records because their administrative use may extend for many decades. However, the identification of such records by the cartographic archivist is a necessary part of completing the outline of the cartographic administrative history. By making their existence known, the way is prepared for their eventual scheduling by archives.

Although it may be an esoteric discipline, cartography has fortunately evolved a "distinct body of theory and practice that includes

a series of processes that are peculiarly cartographic and common to the making of all maps."⁸ The challenge for the cartographic archivist lies in making the agency aware that the records resulting from processes such as generalization (for example, the worksheets and overlays) are in fact records and that they are records which tell something of the technology utilized to manipulate data during the making of the map. An archivist who is knowledgeable about the wide scope of the cartographic process, that it documents the history of our physical and cultural environment, can argue convincingly for the scheduling of such records. This is becoming more vital with the advent of automated technology in map agencies today. Digitized data and computer-assisted cartography (machines performing the necessary, repetitive tasks)⁹ where the composition records may be fleeting (in one form today, updated to another form the next) and simply non-existent in any traditional, tangible form unless called forth, genie-like from the database, present a particular problem. The information in the database, both as raw data and as it appears when retrieved by computer printout, is primary material and has the characteristics of a record as much as manually produced thematic overlays of traditional map making have. For the cartographic archivist, identification of the record must begin at the basic level of data management. This "master file" is where most data is stored before being used to carry out specific operations. The documentation must accompany the data files so that "the interrelationships between the records and the units of information within each record"¹⁰ are maintained. The cartographer and/or programmer working through the beginning stages of a programme will soon leave behind

the documentation as the basic programme evolves and manipulation of the data elements for specialized projects takes place. As a result there may not be sufficient information allowing access to the programme in all its forms by persons, especially those outside the agency, at a later date. Also, without documentation the archivist may be unable to do any content analysis to determine if the records are of value. Another problem is the updatability of the data:

Many modern databases are interactive and real-time updatable which means that a user may change the data stored in the database instantaneously. Archivists have yet to devise a method for documenting this "editing" process or for "archiving" the contents of databases.¹¹

The capability to manipulate large amounts of data quickly and efficiently is what makes a database particularly useful to an agency but it is this feature which poses the greatest challenge to the archivist.

The values in a textual record can be appraised by examining the content of that particular document on its own and by considering it in the context of the others in the unit, whether that unit is one file or one metre of material. However, with computer technology the limitations on arrangement of information (time, patience, energy) are lessened and the pool of data can be added to, deleted from, and individual elements combined and recombined to create numerous data sets which are unique to the agency. Knowledge of such agency-specific manipulations must be gained or the data pool will be little more than a mass of unrelated facts. It is the relationships amongst these facts that an agency feels are important or that enable it to carry out projects which give enduring

value to the data. As is pointed out by Dorothy Ahlgren and John McDonald, ". . . there is today no assurance that, having acquired the form, archivists have acquired the substance" and the electronic medium houses "information contained in formats where stability is not intended and therefore is not achieved."¹² The archivist is therefore faced with decisions pertaining to the identification of the elements in the database which need to be retained as well as questions of how and when to transfer those items.¹³ In addition, the appraisal process is affected by practical considerations of both software dependency (where data can only be read if processed on a computer which supports compatible software for that data) and costs of storing and preserving such records.

This discussion may seem to have strayed from the specific topic of cartographic archives in British Columbia but it was intended to indicate what cartographic archivists everywhere are facing. Cartographers have been developing computer applications in their work for many years and are moving steadily towards the time when cartography will be completely automated. At the present time however the transition is still underway from manual to automated systems resulting in a mix of records formats. Whether cartographic records are on paper or on disk, the archivist is concerned with the preservation of the information. The increased use of automation allows more thorough utilization of data by the agency. This added capability demands that more than ever before, the archivist must be knowledgeable about the records production within the context of the administrative history of the cartographic agency. The structure and

functions of departments will provide important clues to the use of data and the type of records which might result. Today, the composite nature of cartographic records includes the variety of tangible documents, such as maps, proofs, and correspondence as well as the range of information which remains in database format.

The task of developing a specialized archives of cartographic materials is hampered in most repositories in British Columbia and elsewhere by the lack of space and manpower. Due to the shift in emphasis towards the acquisition of public records by government-sponsored archives, they are faced with having to acquire records from a greater number of departments involved in the creation of maps. If there is a records management system in place, this will help identify records and ensure the regular deposit of those with value, both primary (to the agency) and secondary (to other agencies and independent researchers) in the archives. Some direction may be given to the records manager by the guidelines the archives sets out for itself. Each cartographic archives has to determine what its responsibilities to its sponsor are and what the needs of its researchers are as well as what is required to document the history of cartography itself. It is only by taking an active role in understanding the record that archivists can hope to meet the challenge within the constraints faced by most archives. The archivist needs to know about cartography and be aware of its aspects of art and science in order to interpret some of the ideas behind cartographic communication. Cartographic archivists need the perspective this knowledge gives them so that the most valuable records

of the agencies will be recognized and therefore have a better chance of surviving the dangerous "interval of vulnerability between the moment at which the practical usefulness of a map is exhausted and the moment at which it awakes the interest of historians as a relic or memorial of the past"¹⁴ spoken of by Raleigh Skelton. Archivists must also be knowledgeable if they are to avoid slipping back into a passive role in acquisition. Appraisal is an assertive archival function and therefore, to be most effective, it must be backed by familiarity with the records and an appreciation of their dynamic quality.

However, cartographic archivists cannot preserve everything in the hopes of providing material for every conceivable research topic in the future. This is certainly true of composition records. As important as these are it is not necessary (and would not be possible) to keep all the composition records for each map. These records generally do not have enduring value if they "duplicate the original survey maps and the final printed maps."¹⁵ A set of records which follows the development of a seminal map or particular overlays which may contain information not shown on the final map are examples of the type of composition records which should be identified and acquired.

Archivists are said to be responsible for the preservation of the record for the future and nowhere is this duty more keenly felt than in the archival function of appraisal. The many factors being considered during the appraisal process are now heightened by an awareness of cost. Although archives generally spend very little on actual acquisition,

relying instead on donors and sponsoring institutions,¹⁶ the cost of housing, maintaining and referencing records is increasing constantly. As cartography is a multifaceted discipline it is important that as complete a record as possible be acquired, and this argues for the preservation of more than simply the published map. Each stage of the record, whether composition or published, has importance and a greater balance in the acquisition of each by archives is needed. The totality of the record is important as it provides context which is particularly vital if cartographic records are to tell of the history of cartography. The story of how the map itself came to be is a complicated one. That there is a wider range of records is evident, for example, in the study of cartographic communication. There are so many aspects to cartography--surveying, drafting, publishing--all handled by different specialists. The information on the map (the subject) is also ultimately the result of the work of more specialists than just the cartographers themselves, for example geographers, geologists and the military. All of this information and methodology from these diverse sources has been fused into one body of knowledge. The scientific side has also, through time, been amalgamated with the experience, dreams and imagination of earlier map makers and explorers. Each region has seen its mapping grow and diversify and this is still happening with great speed. It is within this chain of information or network that the cartographic memory of an area will be found. If archivists do not know the range of the record, archives will not document the important stages of the development of man's impact on the land nor show the technical evolution of the cartographic record form.

The range of the record comes from two sources, the agencies and the internal records within any given agency. As we have seen, cartography is a set of processes which have evolved through input from all over a given area and the country. Therefore cartographic records do not come into being or exist in isolation, they are part of a large framework. The records fit together as the records of British Columbia fit in with the records of federal programmes. This overlapping of programmes and ideas will be discovered through the administrative survey. Appraisers need to find out about records shared amongst agencies and about their life cycle in the agencies. Records with ongoing usefulness to the creating and/or borrowing agency must be identified and their potential life span determined. Here an agency official, preferably a records manager, will have an important role to play in appraisal in cooperation with the archivist. In particular, the agency will play a vital part in the appraisal of machine-readable cartography as it will be able to assist the archivist in making periodic reviews of the data to determine its continuing value.

The reliance on the map making offices by archives is necessary when dealing with their records. The diversity of agencies and the overlap of federal, provincial and municipal programmes makes acquisition complicated. Outlining collection policies and acquisition guidelines helps foster communication within the local network of diverse repositories in order to benefit selection so that hopefully in future there will not be the gaps in the record that face us today. But archives are the result of collective and cumulative effort. What is

needed is a good basic structure consisting of knowledgeable (graphic) staff, cooperation amongst agencies and archives, and a balanced records acquisition mandate upon which to build archives of the future.

Cartographic archives are in an interesting position in relation to the records they serve. There is opportunity for greater involvement with the creation of the record in the sense of having an awareness of the techniques behind map production. There is also the opportunity to participate in an active network of agencies whose collective goal is the effective transmission of information about the land and our view of it. These opportunities must be acted upon: cartographic records themselves are not static and archives should not be static in their dealings with them. It is such sharing of resources and active involvement that will ultimately benefit the future understanding of contemporary cartographic records.

NOTES

CHAPTER IV

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